清雲科技大學　資訊工程系　計算機程式設計會考參考程式

2012/06/04

【易組參考程式】

```
1  #include <stdio.h>
   int main()
   {
       int amount, coin10, coin5, coin1;

       printf("請輸入要兌換的金額：");
       scanf("%d",&amount);
       coin10=amount/10;
       coin5=(amount%10)/5;
       coin1=((amount%10)%5)/1;
       printf("可兌換10元硬幣 %d 個\n",coin10);
       printf("可兌換5元硬幣 %d 個\n",coin5);
       printf("可兌換1元硬幣 %d 個\n",coin1);
       return 0;
   }
```

考試版本

```
#include <stdio.h>
int main()
{
    int amount, coin10, coin5, coin1;

    scanf("%d",&amount);
    coin10=amount/10;
    coin5=(amount%10)/5;
    coin1=((amount%10)%5)/1;
    printf("%d\n",coin10);
    printf("%d\n",coin5);
    printf("%d\n",coin1);
    return 0;
}
```

2
```
#include <stdio.h>
#define PI 3.14159
int main()
{
    double r, volume, area;

    printf("請輸入半徑：");
    scanf("%lf",&r);
    volume=4.0/3.0*PI*r*r*r;
    area=4.0*PI*r*r;
    printf("球體體積為%.2f\n",volume);
    printf("表面積為%.2f\n",area);
    return 0;
}
```

考試版本

```
#include <stdio.h>
#define PI 3.14159
int main()
{
    double r, volume, area;

    scanf("%lf",&r);
    volume=4.0/3.0*PI*r*r*r;
    area=4.0*PI*r*r;
    printf("%.2f\n",volume);
    printf("%.2f\n",area);
    return 0;
}
```

3
```
#include <stdio.h>
#include <math.h>
int main()
{
    double x1, y1, x2, y2, distance, slope;

    printf("請輸入第 1 點座標(x1,y1):");
    scanf("%lf,%lf",&x1,&y1);
    printf("請輸入第 2 點座標(x2,y2):");
    scanf("%lf,%lf",&x2,&y2);
    distance=sqrt((x2-x1)*(x2-x1)+(y2-y1)*(y2-y1));
    slope=(y2-y1)/(x2-x1);
    printf("兩點的距離=%.2f\n",distance);
    printf("兩點的斜率=%.2f\n",slope);
    return 0;
}
```

考試版本

```
#include <stdio.h>
#include <math.h>
int main()
{
    double x1, y1, x2, y2, distance, slope;

    scanf("%lf,%lf",&x1,&y1);
    scanf("%lf,%lf",&x2,&y2);
    distance=sqrt((x2-x1)*(x2-x1)+(y2-y1)*(y2-y1));
    slope=(y2-y1)/(x2-x1);
    printf("%.2f\n",distance);
    printf("%.2f\n",slope);
    return 0;
}
```

4
```
#include <stdio.h>
#include <math.h>
int main()
{
    int a, b;
    double result;

    printf("請輸入數值A:");
    scanf("%d",&a);
    printf("請輸入數值B:");
    scanf("%d",&b);
    result=(double)a/(double)b*100;
    printf("A是B的%.4f%%\n",result);
    return 0;
}
```

考試版本

```
#include <stdio.h>
#include <math.h>
int main()
{
    int a, b;
    double result;

    scanf("%d",&a);
    scanf("%d",&b);
    result=(double)a/(double)b*100;
    printf("%.4f%%\n",result);
    return 0;
}
```

5
```
#include <stdio.h>
int main()
{
   int x, y, a, b, r;
   printf("請輸入分式的分子及分母：");
   scanf("%d%d",&a,&b);
   if(b==0){
      printf("分母不可為 0");
      return 0;
   }
   x=a;
   y=b;
   while(y!=0)
   {
      r=x%y;
      x=y;
      y=r;
   }
   a=a/x;
   b=b/x;
   printf("化簡後的分式輸出為 %d %d\n",a,b);
   return 0;
}
```

考試版本

```
#include <stdio.h>
int main()
{
   int x, y, a, b, r;
   scanf("%d%d",&a,&b);
   if(b==0){
      printf("0");
      return 0;
   }
   x=a;
   y=b;
   while(y!=0)
   {
      r=x%y;
      x=y;
      y=r;
   }
   a=a/x;
   b=b/x;
   printf("%d %d\n",a,b);
   return 0;
}
```

6
```
#include<stdio.h>
int main()
{
    int i;
    for(i=40;i<128;i++){
        printf("ASCII:%d = %c \n",i,i);
    }
    return 0;
}
```

7
```
#include <stdio.h>
#include <math.h>
int main()
{
    int x, y;
    double z;

    printf("請輸入x值：");
    scanf("%d",&x);
    printf("請輸入y值：");
    scanf("%d",&y);
    z=(x*x*x*y-4*(x*x*y+y*y*y))/sqrt(x*y-1);
    printf("x=%d\n",x);
    printf("y=%d\n",y);
    printf("z=%f\n",z);
    return 0;
}
```

考試版本

```
#include <stdio.h>
#include <math.h>
int main()
{
    int x, y;
    double z;

    scanf("%d",&x);
    scanf("%d",&y);
    z=(x*x*x*y-4*(x*x*y+y*y*y))/sqrt(x*y-1);
    printf("%d\n",x);
    printf("%d\n",y);
    printf("%f\n",z);
    return 0;
}
```

8
```
#include <stdio.h>
#include <math.h>
int main()
{
    double kilometer, bill;

    printf("請輸入里程數：");
    scanf("%lf",&kilometer);
    if(kilometer<=2.0)
        bill=100;
    else
        bill=100+floor((kilometer-2.0)/0.5)*5;
    printf("計程車車費為%.0f元\n",bill);
    return 0;
}
```

考試版本

```
#include <stdio.h>
#include <math.h>
int main()
{
    double kilometer, bill;

    scanf("%lf",&kilometer);
    if(kilometer<=2.0)
        bill=100;
    else
        bill=100+floor((kilometer-2.0)/0.5)*5;
    printf("%.0f\n",bill);
    return 0;
}
```

9
```
#include <stdio.h>
int main()
{
    int i,s=0, n;
    printf("請輸入 n 的值 : ");
    scanf("%d",&n);
    for(i=1;i<n;i++){
        s+=i;
       printf("%d+",i);
   }
    s+=n;
    printf("%d=%d",n,s);
    return 0;
}
```

考試版本

```
#include <stdio.h>
int main()
{
    int i,s=0, n;
    scanf("%d",&n);
    for(i=1;i<n;i++){
        s+=i;
       printf("%d+",i);
   }
    s+=n;
    printf("%d=%d",n,s);
    return 0;
}
```

10
```c
#include <stdio.h>
int main()
{
    int i, j=1, s=0, n;
    do{
        printf("請輸入n值：");
        scanf("%d",&n);
    } while(n<0 || n%2==0);
    for(i=1; i<=n; i+=2)
    {
        s=s+(i*i)*j;
        j=j*-1;
    }
    printf("s= %d\n",s);
    return 0;
}
```

考試版本

```c
#include <stdio.h>
int main()
{
    int i, j=1, s=0, n;
    do{
        scanf("%d",&n);
    } while(n<0 || n%2==0);
    for(i=1; i<=n; i+=2)
    {
        s=s+(i*i)*j;
        j=j*-1;
    }
    printf("%d\n",s);
    return 0;
}
```

11
```c
#include <stdio.h>
#include <math.h>
double sum(int);
int main()
{
    int n;
    printf("請輸入一個整數n：");
    scanf("%d",&n);
    printf("多項式之結果=%f\n",sum(n));
    return 0;
}

double sum(int n)
{
   int i;
   double s=0;
   for(i=1; i<=n; i++)
        s=s+pow(-1,i+1)/(double)i;
   return s;
}
```

考試版本

```c
#include <stdio.h>
#include <math.h>
double sum(int);
int main()
{
    int n;
    scanf("%d",&n);
    printf("%f\n",sum(n));
    return 0;
}

double sum(int n)
{
   int i;
   double s=0;
   for(i=1; i<=n; i++)
        s=s+pow(-1,i+1)/(double)i;
   return s;
}
```

12
```
#include <stdio.h>
int main()
{
    int i, n, sum=0;
    printf("輸入 n 值：");
    scanf("%d", &n);
    for(i=2; i<=n; i++)
        sum=sum+(i-1)*i;
    printf("1*2+2*3+3*4+...+(n-1)*n=%d", sum);
    return 0;
}
```

考試版本

```
#include <stdio.h>
int main()
{
    int i, n, sum=0;
    scanf("%d", &n);
    for(i=2; i<=n; i++)
        sum=sum+(i-1)*i;
    printf("%d", sum);
    return 0;
}
```

13
```
#include <stdio.h>
int main()
{
    int n=0, s=0, k;
    printf("輸入k值：");
    scanf("%d",&k);
    while(s<=k)
        s+=++n;
    printf("n=%d\n",n);
    return 0;
}
```

考試版本

```
#include <stdio.h>
int main()
{
    int n=0, s=0, k;
    scanf("%d",&k);
    while(s<=k)
        s+=++n;
    printf("%d\n",n);
    return 0;
}
```

14
```c
#include <stdio.h>
int main()
{
    int i, n, data, sum=0;
    float avg;
    printf("請輸入n值：");
    scanf("%d", &n);
    for(i=1; i<=n; i++){
        printf("輸入第 %d 個整數：",i);
        scanf("%d", &data);
        sum = sum + data;
    }
    avg=(float)sum/n;
    printf("平均值為 %.2f ", avg);
    return 0;
}
```

考試版本

```c
#include <stdio.h>
int main()
{
    int i, n, data, sum=0;
    float avg;
    scanf("%d", &n);
    for(i=1; i<=n; i++){
        scanf("%d", &data);
        sum = sum + data;
    }
    avg=(float)sum/n;
    printf("%.2f ", avg);
    return 0;
}
```

15
```c
#include <stdio.h>
int main()
{
    int i, n;
    printf("請輸入一個正整數：");
    scanf("%d",&n);
    printf("其因數有 ");
    for(i=1; i<=n/2; i++)
        if(n%i==0)
            printf("%d\t",i);
    printf("%d\n",n);
    return 0;
}
```

考試版本

```c
#include <stdio.h>
int main()
{
    int i, n;
    scanf("%d",&n);
    for(i=1; i<=n/2; i++)
        if(n%i==0)
            printf("%d\t",i);
    printf("%d\n",n);
    return 0;
}
```

16
```
#include <stdio.h>
int main()
{
    int s,k;

    printf("輸入 1 個小於 100 的正整數：");
    scanf("%d",&k);
    while(k <= 0 || k >= 100){
        printf("請重新輸入小於 100 的正整數");
        scanf("%d",&k);
    }
    for(s=k ; s<=500 ; s+=k)
         printf("%d ",s);
    return 0;
}
```

考試版本

```
#include <stdio.h>
int main()
{
    int s,k;

    scanf("%d",&k);
    while(k <= 0 || k >= 100){
          scanf("%d",&k);
    }
    for(s=k ; s<=500 ; s+=k)
         printf("%d ",s);
    return 0;
}
```

17
```c
#include <stdio.h>
int main()
{
   int tsec, hour, minute, second;

   printf("請輸入準備轉換的秒數:");
   scanf("%d",&tsec);
   second=tsec%60;
   minute=(tsec/60)%60;
   hour=tsec/60/60;
   printf("hh:mm:ss = %02d:%02d:%02d\n",hour,minute,second);
   return 0;
}
```

考試版本

```c
#include <stdio.h>
int main()
{
   int tsec, hour, minute, second;

   scanf("%d",&tsec);
   second=tsec%60;
   minute=(tsec/60)%60;
   hour=tsec/60/60;
   printf("%02d:%02d:%02d\n",hour,minute,second);
   return 0;
}
```

18
```c
#include <stdio.h>
int main()
{
    int now_h, now_m, end_h, end_m, hour, minute;

    printf("目前時間：");
    scanf("%d:%d",&now_h,&now_m);
    printf("結束時間：");
    scanf("%d:%d",&end_h,&end_m);
    hour = end_h - now_h;
    minute = end_m - now_m;
    if(minute < 0){
        minute = minute + 60;
        hour = hour - 1;
    }
    if(hour < 0) hour = hour + 24;
    printf("剩下");
    if(hour != 0){
        printf("%d小時",hour);
        if(minute != 0)
            printf("%d分鐘",minute);
    }
    else
        printf("%d分鐘",minute);
    return 0;
}
```

考試版本

```c
#include <stdio.h>
int main()
{
    int now_h, now_m, end_h, end_m, hour, minute;

    scanf("%d:%d",&now_h,&now_m);
    scanf("%d:%d",&end_h,&end_m);
    hour = end_h - now_h;
    minute = end_m - now_m;
    if(minute < 0){
        minute = minute + 60;
        hour = hour - 1;
    }
    if(hour < 0) hour = hour + 24;
    if(hour != 0){
        printf("%d ",hour);
        if(minute != 0)
          printf("%d ",minute);
    }
    else
        printf("%d ",minute);
    return 0;
}
```

19
```c
#include <stdio.h>
int main()
{
   int time1_h, time1_m, time2_h, time2_m, day=0, hour, minute;
   printf("時間1：");
   scanf("%d:%d",&time1_h,&time1_m);
   printf("時間2：");
   scanf("%d:%d",&time2_h,&time2_m);
   hour=time1_h+time2_h;
   minute=time1_m+time2_m;
   if(minute >= 60){
       minute = minute - 60;
       hour = hour + 1;
   }
   if(hour >= 24){
      day = hour / 24;
      hour = hour % 24;
   }
   printf("相加時間為");
   if(day != 0) {
       printf("%d天", day);
       printf("%d小時", hour);
   }else if(hour != 0)
       printf("%d小時", hour);
   printf("%d分鐘", minute);
   return 0;
}
```

考試版本

```c
#include <stdio.h>
int main()
{
   int time1_h, time1_m, time2_h, time2_m, day=0, hour, minute;
   scanf("%d:%d",&time1_h,&time1_m);
   scanf("%d:%d",&time2_h,&time2_m);
   hour=time1_h+time2_h;
   minute=time1_m+time2_m;
   if(minute >= 60){
       minute = minute - 60;
       hour = hour + 1;
   }
   if(hour >= 24){
       day = hour / 24;
       hour = hour % 24;
   }
   if(day != 0) {
      printf("%d ", day);
      printf("%d ", hour);
   }else if(hour != 0)
       printf("%d ", hour);
   printf("%d ", minute);
   return 0;
}
```

20
```c
#include <stdio.h>
int main()
{
   int start,end,start_y,start_m,start_d,end_y,end_m,end_d;
   int months[]={0,31,59,90,120,151,181,212,243,273,304,334,365};
   int days,temp;
   printf("日期1：");
   scanf("%d",&start);
   printf("日期2：");
   scanf("%d",&end);
   if(start>end){
        temp=start;
        start=end;
        end=temp;
   }
   start_y=start/10000;
   start=start%10000;
   start_m=start/100;
   start_d=start%100;
   end_y=end/10000;
   end=end%10000;
   end_m=end/100;
   end_d=end%100;
   if(start_y==end_y){
        if(start_m==end_m){
             days=end_d-start_d;
             printf("相差%d天\n",days);
       }else{
            days=months[end_m-1]+end_d-months[start_m-1]-start_d;
            printf("相差%d天\n",days);
       }
   }else{
        days=(365-months[start_m-1]-start_d);
        days+=365*(end_y-start_y-1);
        days+=months[end_m-1]+end_d;
        printf("相差%d天\n",days);
   }
   return 0;
}
```

考試版本

```
#include <stdio.h>
int main()
{
   int start,end,start_y,start_m,start_d,end_y,end_m,end_d;
   int months[]={0,31,59,90,120,151,181,212,243,273,304,334,365};
   int days,temp;
   scanf("%d",&start);
   scanf("%d",&end);
   if(start>end){
      temp=start;
      start=end;
      end=temp;
   }
   start_y=start/10000;
   start=start%10000;
   start_m=start/100;
   start_d=start%100;
   end_y=end/10000;
   end=end%10000;
   end_m=end/100;
   end_d=end%100;
   if(start_y==end_y){
      if(start_m==end_m){
         days=end_d-start_d;
         printf("%d\n",days);
      }else{
         days=months[end_m-1]+end_d-months[start_m-1]-start_d;
         printf("%d\n",days);
      }
   }else{
      days=(365-months[start_m-1]-start_d);
      days+=365*(end_y-start_y-1);
      days+=months[end_m-1]+end_d;
      printf("%d\n",days);
   }
   return 0;
}
```

21
```
#include <stdio.h>
#include <string.h>
int main()
{
   char str1[21], str2[21];
   printf("請輸入字串 1：");
   gets(str1);
   printf("請輸入字串 2：");
   gets(str2);
   if(strcmp(str1,str2)==0)
      printf("%d",strlen(str1));
   else
      printf("0");
   return 0;
}
```

考試版本

```
#include <stdio.h>
#include <string.h>
int main()
{
   char str1[21], str2[21];
   gets(str1);
   gets(str2);
   if(strcmp(str1,str2)==0)
       printf("%d",strlen(str1));
   else
       printf("0");
   return 0;
}
```

22
```
#include <stdio.h>
#include <math.h>
int main()
{
   double x1, x2, h, s;

   printf("請輸入 x1 值：");
   scanf("%lf",&x1);
   printf("請輸入 x2 值：");
   scanf("%lf",&x2);
   h=(x2-x1)/2.0;

s=h/3*(exp(x1)/(x1*x1+1)+4*exp(x1+h)/((x1+h)*(x1+h)+1)+exp(x2)/
(x2*x2+1));
   printf("S=%f\n",s);
   return 0;
}
```

考試版本

```
#include <stdio.h>
#include <math.h>
int main()
{
   double x1, x2, h, s;

   scanf("%lf",&x1);
   scanf("%lf",&x2);
   h=(x2-x1)/2.0;

s=h/3*(exp(x1)/(x1*x1+1)+4*exp(x1+h)/((x1+h)*(x1+h)+1)+exp(x2)/
(x2*x2+1));
   printf("%f\n",s);
   return 0;
}
```

23
```c
#include <stdio.h>
#include <math.h>
double fun(double,double);
int main()
{
   double x;

   printf("請輸入x(x>0)值：");
   scanf("%lf",&x);
   printf("h=10^-1 , 微分值=%f\n",fun(x,pow(10,-1)));
   printf("h=10^-2 , 微分值=%f\n",fun(x,pow(10,-2)));
   printf("h=10^-3 , 微分值=%f\n",fun(x,pow(10,-3)));
   return 0;
}

double fun(double x, double h)
{
   return (log(x+h)-log(x))/h;
}
```

考試版本

```c
#include <stdio.h>
#include <math.h>
double fun(double,double);
int main()
{
   double x;

   scanf("%lf",&x);
   printf("%f\n",fun(x,pow(10,-1)));
   printf("%f\n",fun(x,pow(10,-2)));
   printf("%f\n",fun(x,pow(10,-3)));
   return 0;
}

double fun(double x, double h)
{
   return (log(x+h)-log(x))/h;
}
```

24
```c
#include <stdio.h>
#include <math.h>
int main()
{
   double a, b, c, perimeter, s, area;
   printf("請輸入三個數值：");
   scanf("%lf%lf%lf",&a,&b,&c);
   if((a>0 && b>0 && c>0) && (a+b>c && a+c>b && b+c>a))
   {
      perimeter=a+b+c;
      s=(a+b+c)/2;
      area=sqrt(s*(s-a)*(s-b)*(s-c));
      printf("三角形的周長=%f\n",perimeter);
      printf("三角形的面積=%f\n",area);
   }
   else
      printf("此三個數值無法構成三角形的三邊\n");
   return 0;
}
```

考試版本

```c
#include <stdio.h>
#include <math.h>
int main()
{
   double a, b, c, perimeter, s, area;
   scanf("%lf%lf%lf",&a,&b,&c);
   if((a>0 && b>0 && c>0) && (a+b>c && a+c>b && b+c>a))
   {
      perimeter=a+b+c;
      s=(a+b+c)/2;
      area=sqrt(s*(s-a)*(s-b)*(s-c));
      printf("%f\n",perimeter);
      printf("%f\n",area);
   }
   else
      printf("0\n");
   return 0;
}
```

25
```c
#include <stdio.h>
int main()
{
   int quantity, salary;

   printf("請輸入每月賣出產品的數量：");
   scanf("%d",&quantity);
   if(quantity<=20)
      salary=15000+quantity*380;
   else if(quantity<=40)
      salary=15000+quantity*420;
   else
      salary=15000+quantity*420+(quantity-40)/10*1500;
   printf("每月薪資為%d元\n",salary);
   return 0;
}
```

考試版本

```c
#include <stdio.h>
int main()
{
   int quantity, salary;

   scanf("%d",&quantity);
   if(quantity<=20)
      salary=15000+quantity*380;
   else if(quantity<=40)
      salary=15000+quantity*420;
   else
      salary=15000+quantity*420+(quantity-40)/10*1500;
   printf("%d\n",salary);
   return 0;
}
```

26
```
#include <stdio.h>
int main()
{
   int c=0, i=1, no, p;
   printf("請輸入一個正整數：");
   scanf("%d",&no);
   p=no;
   while(p-i>=0)
   {
      p=p-i;
      c++;
      i=i+2;
   }
   printf("%d 的平方根為 %d\n",no,c);
   return 0;
}
```

考試版本

```
#include <stdio.h>
int main()
{
   int c=0, i=1, no, p;
   scanf("%d",&no);
   p=no;
   while(p-i>=0)
   {
      p=p-i;
      c++;
      i=i+2;
   }
   printf("%d\n",c);
   return 0;
}
```

```
27 #include <stdio.h>
   #include <math.h>
   int main()
   {
      int start_hour, start_min, end_hour, end_min;
      int total, fee;

      printf("停車開始時間：");
      scanf("%d:%d",&start_hour,&start_min);
      printf("停車結束時間：");
      scanf("%d:%d",&end_hour,&end_min);

   total=(int)ceil(((end_hour*60+end_min)-(start_hour*60+start_min
   ))/30.0);
      if(total<=4)
         fee=total*30;
      else if(total<=8)
         fee=4*30+(total-4)*40;
      else
         fee=4*30+4*40+(total-8)*60;
      printf("需繳交的停車費為%d元\n",fee);
      return 0;
   }
```

考試版本

```
   #include <stdio.h>
   #include <math.h>
   int main()
   {
      int start_hour, start_min, end_hour, end_min;
      int total, fee;

      scanf("%d:%d",&start_hour,&start_min);
      scanf("%d:%d",&end_hour,&end_min);

   total=(int)ceil(((end_hour*60+end_min)-(start_hour*60+start_min
   ))/30.0);
      if(total<=4)
         fee=total*30;
      else if(total<=8)
         fee=4*30+(total-4)*40;
      else
         fee=4*30+4*40+(total-8)*60;
      printf("%d\n",fee);
      return 0;
   }
```

28
```c
#include <stdio.h>
int main()
{
   int category, number, power;
   double bill;

   printf("請輸入用電類別(1~3)：");
   scanf("%d",&category);
   printf("請輸入使用度數：");
   scanf("%d",&number);
   switch(category)
   {
      case 1:
         if(number<=100)
            bill=number*2.4;
         else if(number<=300)
            bill=100*2.4+(number-100)*3.1;
         else
            bill=100*2.4+200*3.1+(number-300)*4.1;
         break;
      case 2:
         printf("請輸入契約馬力：");
         scanf("%d",&power);
         bill=power*138+number*1.83;
         break;
      case 3:
         if(number<=300)
            bill=number*5.9;
         else
            bill=300*5.9+(number-300)*6.7;
   }
   printf("電費=%f 元\n",bill);
   return 0;
}
```

考試版本

```c
#include <stdio.h>
int main()
{
   int category, number, power;
   double bill;

   scanf("%d",&category);
   scanf("%d",&number);
   switch(category)
   {
      case 1:
         if(number<=100)
            bill=number*2.4;
         else if(number<=300)
            bill=100*2.4+(number-100)*3.1;
         else
            bill=100*2.4+200*3.1+(number-300)*4.1;
         break;
      case 2:
         scanf("%d",&power);
         bill=power*138+number*1.83;
         break;
      case 3:
         if(number<=300)
            bill=number*5.9;
         else
            bill=300*5.9+(number-300)*6.7;
   }
   printf("%f\n",bill);
   return 0;
}
```

29
```c
#include <stdio.h>
int main()
{
    int month;
    printf("請輸入月份：");
    scanf("%d",&month);
    switch(month){
        case 3: case 4: case 5:
            printf("春季\n"); break;
        case 6: case 7: case 8:
            printf("夏季\n"); break;
        case 9: case 10: case 11:
            printf("秋季\n"); break;
        case 12: case 1: case 2:
            printf("冬季\n"); break;
        default:
            printf("輸入錯誤\n");
    }
   return 0;
}
```

考試版本

```c
#include <stdio.h>
int main()
{
    int month;
    scanf("%d",&month);
    switch(month){
        case 3: case 4: case 5:
            printf("春季\n"); break;
        case 6: case 7: case 8:
            printf("夏季\n"); break;
        case 9: case 10: case 11:
            printf("秋季\n"); break;
        case 12: case 1: case 2:
            printf("冬季\n"); break;
        default:
            printf("輸入錯誤\n");
    }
   return 0;
}
```

30
```c
#include <stdio.h>
int main()
{
    int i;
    char string[1024], ch;

    printf("輸入字串：");
    scanf("%s", string);
    printf("編碼後為");
    i=0;
    while(string[i]!='\0'){
        ch=string[i];
        if(ch>='A' && ch<='Z')
            string[i]='A'+'Z'-ch;
        else
            string[i]='a'+'z'-ch;
        i++;
    }
    printf("%s", string);
    return 0;
}
```

考試版本

```c
#include <stdio.h>
int main()
{
    int i;
    char string[1024], ch;

    scanf("%s", string);
    i=0;
    while(string[i]!='\0'){
        ch=string[i];
        if(ch>='A' && ch<='Z')
            string[i]='A'+'Z'-ch;
        else
            string[i]='a'+'z'-ch;
        i++;
    }
    printf("%s", string);
    return 0;
}
```

==========

【中組參考程式】

```
31 #include <stdio.h>
   int main()
   {
       int i, max, min, data;
       printf("輸入第1個整數：");
       scanf("%d", &data);
       max = min = data;
       for(i=2; i<=10; i++) {
           printf("輸入第%d個整數：", i);
           scanf("%d", &data);
           if (data > max)
           max = data;
           else if (data < min)
               min = data;
       }
       printf("最大值為%d\n", max);
       printf("最小值為%d\n", min);
       return 0;
   }
```

考試版本

```
   #include <stdio.h>
   int main()
   {
       int i, max, min, data;
      scanf("%d", &data);
       max = min = data;
       for(i=2; i<=10; i++) {
           scanf("%d", &data);
           if (data > max)
           max = data;
           else if (data < min)
               min = data;
       }
       printf("%d\n", max);
       printf("%d\n", min);
       return 0;
   }
```

32
```
#include <stdio.h>
int main()
{
    int i,j, a[10], k, ans=0;
    for(i=0; i<=9; i++){
       printf("輸入第%d 個整數：", i+1);
       scanf("%d", &a[i]);
    }
    printf("輸入 k 值：");
    scanf("%d", &k);
    for(i=0; i<=8; i++)
       for(j=i+1; j<=9; j++)
          if(a[i]+a[j] == k) {
             printf("(%d, %d)\n", a[i], a[j]);
             ans=1;
          }
    if (ans==0) printf("0", k);
    return 0;
}
```

考試版本

```
#include <stdio.h>
int main()
{
    int i,j, a[10], k, ans=0;
    for(i=0; i<=9; i++){
        scanf("%d", &a[i]);
    }
    scanf("%d", &k);
    for(i=0; i<=8; i++)
       for(j=i+1; j<=9; j++)
          if(a[i]+a[j] == k) {
             printf("%d %d\n", a[i], a[j]);
             ans=1;
          }
    if (ans==0) printf("0");
    return 0;
}
```

33
```
#include <stdio.h>
int MaxSubsequenceSum(int a[], int n)
{
    int sum, maxsum, i;
    sum = maxsum = 0;
    for(i = 0; i < n; i++){
        sum += a[i];
        if(sum > maxsum)
            maxsum = sum;
        else if(sum < 0)
            sum = 0;
    }
    return maxsum;
}

int main()
{
    int i, a[10];
    for(i=0; i<=9; i++){
       printf("輸入第%d個整數：", i+1);
       scanf("%d", &a[i]);
    }
    printf("最大連續子序列和為%d ", MaxSubsequenceSum(a, 10));
    return 0;
}
```

考試版本

```
#include <stdio.h>
int MaxSubsequenceSum(int a[], int n)
{
    int sum, maxsum, i;
    sum = maxsum = 0;
    for(i = 0; i < n; i++){
        sum += a[i];
        if(sum > maxsum)
            maxsum = sum;
        else if(sum < 0)
            sum = 0;
    }
    return maxsum;
}

int main()
{
    int i, a[10];
    for(i=0; i<=9; i++){
        scanf("%d", &a[i]);
    }
    printf("%d ", MaxSubsequenceSum(a, 10));
    return 0;
}
```

34
```c
#include <stdio.h>
#include <string.h>
int main()
{
    int i,j,length;
    char s[1001];
    printf("輸入字串：");
    scanf("%s",s);
    length = strlen(s);
    for(i=0;i<length;i++){
        for(j=0;j<i;j++)
            if(s[i]==s[j]) break;
        if(j==i) printf("%c", s[i]);
    }
    return 0;
}
```

考試版本

```c
#include <stdio.h>
#include <string.h>
int main()
{
    int i,j,length;
    char s[1001];
    scanf("%s",s);
    length = strlen(s);
    for(i=0;i<length;i++){
        for(j=0;j<i;j++)
            if(s[i]==s[j]) break;
        if(j==i) printf("%c", s[i]);
    }
    return 0;
}
```

35
```
#include<stdio.h>
#include<string.h>
int main(void)
{
    char s[81];
    int i,j, length;
    printf("輸入字串：");
    scanf("%s", s);
    length=strlen(s);
    for(i=0;i<length;i++){
        for(j=length-i-1;j<length;j++)
            printf("%c",s[j]);
        printf("\n");
    }
    return 0;
}
```

考試版本

```
#include<stdio.h>
#include<string.h>
int main(void)
{
    char s[81];
    int i,j, length;
    scanf("%s", s);
    length=strlen(s);
    for(i=0;i<length;i++){
        for(j=length-i-1;j<length;j++)
            printf("%c",s[j]);
        printf("\n");
    }
    return 0;
}
```

```
36 #include <stdio.h>
   #include <string.h>
   #define SWAP(x,y) t=(x);(x)=(y);(y)=t
   #define N 33
   #define Blen 4
   void encode(char*);
   int main(void)
   {
       char data[N];
       printf("輸入資料：");
       scanf("%s",&data);
       encode(data);
       printf("%s",data);
       return 0;
   }

   void encode(char data[])
   {
       int digit,i,j,t,len,zerolen;
       len=strlen(data);
       if(len%Blen != 0){
           zerolen=Blen-len%Blen;
           for(i=0;i<zerolen;i++)
               data[len++]='0';
           data[len]='\0';
       }
       for(i=0;data[i]!='\0';i+=Blen){
           for(j=0;j<Blen;j++){
               digit=data[i+j]-'0';
               digit=(digit+5)%10;
               data[i+j]=digit+'0';
           }
           SWAP(data[i+0],data[i+2]);
           SWAP(data[i+1],data[i+3]);
       }
   }
```

考試版本

```
#include <stdio.h>
#include <string.h>
#define SWAP(x,y) t=(x);(x)=(y);(y)=t
#define N 33
#define Blen 4
void encode(char*);
int main(void)
{
    char data[N];
    scanf("%s",&data);
    encode(data);
    printf("%s",data);
    return 0;
}

void encode(char data[])
{
    int digit,i,j,t,len,zerolen;
    len=strlen(data);
    if(len%Blen != 0){
        zerolen=Blen-len%Blen;
        for(i=0;i<zerolen;i++)
            data[len++]='0';
        data[len]='\0';
    }
    for(i=0;data[i]!='\0';i+=Blen){
        for(j=0;j<Blen;j++){
            digit=data[i+j]-'0';
            digit=(digit+5)%10;
            data[i+j]=digit+'0';
        }
        SWAP(data[i+0],data[i+2]);
        SWAP(data[i+1],data[i+3]);
    }
}
```

```
37 #include <stdio.h>
   void insert_sort(int*, int);
   int main()
   {
       int i, n, number[100];
       printf("輸入 n 值：");
       scanf("%d",&n);


       printf("待排序資料：");
       for(i = 0; i < n; i++)
           scanf("%d", &number[i]);
       printf("排序過程\n");
       insert_sort(number, n);
       printf("排序結果：");
       for(i = 0; i < n; i++)
           printf("%d ", number[i]);
       return 0;
   }

   void insert_sort(int *a, int n)
   {
     int i, j, key;
     for(i=1;i<n;i++){
        key=a[i];
        for(j=i-1;j>=0 && key<a[j];j--)
            a[j+1]=a[j];
        a[j+1]=key;
        printf("pass %d: ",i);
        for(j=0;j<n;j++) printf("%d ",a[j]);
        printf("\n");
     }
    }
```

考試版本

```
#include <stdio.h>
void insert_sort(int*, int);
int main()
{
    int i, n, number[100];
    scanf("%d",&n);


    for(i = 0; i < n; i++)
       scanf("%d", &number[i]);
    insert_sort(number, n);
    for(i = 0; i < n; i++)
       printf("%d ", number[i]);
    return 0;
}

void insert_sort(int *a, int n)
{
   int i, j, key;
   for(i=1;i<n;i++){
      key=a[i];
      for(j=i-1;j>=0 && key<a[j];j--)
         a[j+1]=a[j];
      a[j+1]=key;
      for(j=0;j<n;j++) printf("%d ",a[j]);
      printf("\n");
   }
 }
```

```
38 #include <stdio.h>
   void bubble_sort(int *, int);
   void swap(int *, int*);
   int main()
   {
       int i, number[100], n;
       printf("輸入 n 值：");
       scanf("%d", &n);
       printf("待排序資料：");
       for(i=0;i<n;i++) scanf("%d",&number[i]);
       printf("排序過程\n");
       bubble_sort(number, n);
       printf("排序結果：");
       for(i=0;i<n;i++) printf("%d ", number[i]);
       return 0;
   }

   void bubble_sort(int a[], int n)
   {
       int i, j, flag=1;
       for(i=1; i<n && flag==1; i++){
           flag=0;
           for(j=0;j<n-i;j++)
               if(a[j]>a[j+1]){
                   swap(&a[j], &a[j+1]);
                   flag=1;
               }
           printf("Pass %d:",i);
           for(j=0;j<n;j++) printf("%d ",a[j]);
           printf("\n");
      }
   }

   void swap(int *x, int *y)
   {
       int temp;
       temp=*x;
       *x=*y;
       *y=temp;
   }
```

考試版本

```
#include <stdio.h>
void bubble_sort(int *, int);
void swap(int *, int*);
int main()
{
    int i, number[100], n;
    scanf("%d", &n);
    for(i=0;i<n;i++) scanf("%d",&number[i]);
    bubble_sort(number, n);
    for(i=0;i<n;i++) printf("%d ", number[i]);
    return 0;
}

void bubble_sort(int a[], int n)
{
    int i, j, flag=1;
    for(i=1; i<n && flag==1; i++){
        flag=0;
        for(j=0;j<n-i;j++)
            if(a[j]>a[j+1]){
                swap(&a[j], &a[j+1]);
                flag=1;
            }
        for(j=0;j<n;j++) printf("%d ",a[j]);
        printf("\n");
   }
}

void swap(int *x, int *y)
{
    int temp;
    temp=*x;
    *x=*y;
    *y=temp;
}
```

39
```
#include <stdio.h>
void insert_sort_des(int*, int);
int main()
{
    int number[100],i,n,label;
    printf("輸入考生人數：");
    scanf("%d",&n);
    for(i=0;i<n;i++){
       printf("輸入考生成績：");
       scanf("%d", &number[i]);
    }
    insert_sort_des(number,n);
    label=number[(n-1)/2];
    printf("通過的考生成績：");
    for(i = 0; i<n && number[i] >= label; i++)
        printf("%d ", number[i]);
    return 0;
}

void insert_sort_des(int *a, int n)
{
   int i, j, key;
   for(i=1;i<n;i++){
      key=a[i];
      for(j=i-1;j>=0 && key>a[j];j--)
         a[j+1]=a[j];
      a[j+1]=key;
   }
   return;
}
```

考試版本

```
#include <stdio.h>
void insert_sort_des(int*, int);
int main()
{
    int number[100],i,n,label;
    scanf("%d",&n);
    for(i=0;i<n;i++)
      scanf("%d", &number[i]);
    insert_sort_des(number,n);
    label=number[(n-1)/2];
    for(i = 0; i<n && number[i] >= label; i++)
       printf("%d ", number[i]);
    return 0;
}

void insert_sort_des(int *a, int n)
{
   int i, j, key;
   for(i=1;i<n;i++){
      key=a[i];
      for(j=i-1;j>=0 && key>a[j];j--)
         a[j+1]=a[j];
      a[j+1]=key;
   }
   return;
}
```

40
```
#include <stdio.h>
#include <stdio.h>
int search(int *, int, int);
int main()
{
    int number[100],c[100]={0},n,i,index,max=0;
    printf("輸入資料量 n：");
    scanf("%d",&n);
    printf("輸入資料：");
    for(i=0;i<n;i++){
       scanf("%d",&number[i]);
       index=search(number,i,number[i]);
       c[index]++;
       if(c[index]>max)
          max=c[index];
    }
    printf("眾數：");
    for(i = 0; i<n ; i++)
        if(c[i]==max)
           printf("%d ", number[i]);
    return 0;
}

int search(int a[], int size, int key)
{
   int i;
   for(i=0;i<size;i++)
      if(key==a[i])
         return i;
   return size;
}
```

考試版本

```
#include <stdio.h>
int search(int *, int, int);
int main()
{
    int number[100],c[100]={0},n,i,index,max=0;
    scanf("%d",&n);
    for(i=0;i<n;i++){
       scanf("%d", &number[i]);
       index=search(number,i,number[i]);
       c[index]++;
       if(c[index]>max)
          max=c[index];
    }
    for(i = 0; i<n ; i++)
       if(c[i]==max)
          printf("%d ", number[i]);
    return 0;
}

int search(int a[], int size, int key)
{
   int i;
   for(i=0;i<size;i++)
      if(key==a[i])
         return i;
   return size;
}
```

41
```
#include <stdio.h>
void insert_sort(int*, int);
int main()
{
    int number[21],i=0,n;
    printf("請輸入數值：\n");
    do{
        scanf("%d",&number[i++]);
    } while(number[i-1]!=-999);
    n=i-1;
    insert_sort(number,n);
    for(i = 0; i < n; i++)
        printf("%d ", number[i]);
    return 0;
}

void insert_sort(int *a, int n)
{
   int i, j, key;
   for(i=1;i<n;i++){
      key=a[i];
      for(j=i-1;j>=0 && key<a[j];j--)
         a[j+1]=a[j];
      a[j+1]=key;
   }
}
```

考試版本

```
#include <stdio.h>
void insert_sort(int*, int);
int main()
{
    int number[21],i=0,n;
    do{
        scanf("%d",&number[i++]);
    } while(number[i-1]!=-999);
    n=i-1;
    insert_sort(number,n);
    for(i = 0; i < n; i++)
        printf("%d ", number[i]);
    return 0;
}

void insert_sort(int *a, int n)
{
   int i, j, key;
   for(i=1;i<n;i++){
      key=a[i];
      for(j=i-1;j>=0 && key<a[j];j--)
         a[j+1]=a[j];
      a[j+1]=key;
   }
}
```

```
42 #include <stdio.h>
   int binary_search(int *,int,int,int);
   int main()
   {
       int number[100],i,n,k,num;
       printf("輸入資料量 n：");
       scanf("%d",&n);
       for(i=0;i<n;i++){
           scanf("%d",&number[i]);
       }
       printf("輸入欲搜尋 k：");
       scanf("%d",&k);
       num = binary_search(number,k,0,n-1);
       if (num == -1)
           printf("搜尋失敗");
       else
           printf("搜尋次數 : %d ", num);
       return 0;
   }

   int binary_search(int a[],int k, int left, int right)
   {
       int m,num=0;
       while(left<=right){
           m = (left + right)/2;
           num++;
           if(a[m]==k)
               return  num;
           else if(a[m]<k)
               left=m+1;
           else
               right=m-1;
       }
       return  -1;
   }
```

考試版本

```
#include <stdio.h>
int binary_search(int *,int,int,int);
int main()
{
    int number[100],i,n,k,num;
    scanf("%d",&n);
    for(i=0;i<n;i++){
        scanf("%d",&number[i]);
    }
    scanf("%d",&k);
    num = binary_search(number,k,0,n-1);
    if (num == -1)
        printf("0");
    else
        printf("%d ", num);
    return 0;
}

int binary_search(int a[],int k, int left, int right)
{
    int m,num=0;
    while(left<=right){
        m = (left + right)/2;
        num++;
        if(a[m]==k)
            return  num;
        else if(a[m]<k)
            left=m+1;
        else
            right=m-1;
    }
    return  -1;
}
```

43
```
#include <stdio.h>
int main()
{
   int a[4][4]={0};
   int i,j,sum;
   printf("請輸入一個 4x4 的陣列\n");
   for(i=0;i<4;i++)
       for(j=0;j<4;j++)
           scanf("%d",&a[i][j]);
   i=0;
   j=0;
   sum=0;
   while(1){
       sum+=a[i][j];
       printf("%d",a[i][j]);
       (a[i][j]%2==0)?j++:i++;
       if(i>3||j>3)
           break;
       else
           printf("+");
   }
   printf("=%d\n",sum);
   return 0;
}
```

考試版本

```
#include <stdio.h>
int main()
{
   int a[4][4]={0};
   int i,j,sum;
   for(i=0;i<4;i++)
       for(j=0;j<4;j++)
           scanf("%d",&a[i][j]);
   i=0;
   j=0;
   sum=0;
   while(1){
       sum+=a[i][j];
       printf("%d",a[i][j]);
       (a[i][j]%2==0)?j++:i++;
       if(i>3||j>3)
           break;
       else
           printf("+");
   }
   printf("=%d\n",sum);
   return 0;
}
```

```c
44 #include <stdio.h>
   int main()
   {
      FILE *inp, *outp;
      int i, part_number, number_in_stock, nmax, smax;
      double price, pmax;

      inp=fopen("44.txt","r");
      outp=fopen("44_out.txt","w");
      fprintf(outp,"%8s%12s%12s\n","零件號碼","零件價格","存量數目");
      fscanf(inp,"%d%lf%d",&part_number,&price,&number_in_stock);

       fprintf(outp,"%5d\t%11.2f\t%5d\n",part_number,price*1.15,num
       ber_in_stock);
      smax=number_in_stock;
      nmax=part_number;
      pmax=price;
      for(i=1; i<20; i++)
      {

       fscanf(inp,"%d%lf%d",&part_number,&price,&number_in_stock);

       fprintf(outp,"%5d\t%11.2f\t%5d\n",part_number,price*1.15,num
       ber_in_stock);
         if(smax<number_in_stock)
         {
            smax=number_in_stock;
            nmax=part_number;
            pmax=price;
         }
      }
      fprintf(outp,"存量數目最大者\n");
      fprintf(outp," 零件號碼:%d\n",nmax);
      fprintf(outp," 零件價格:%.2f\n",pmax*1.15);
      fprintf(outp," 存量數目:%d\n",smax);
      fclose(inp);
      fclose(outp);
      return 0;
   }
```

考試版本

```
#include <stdio.h>
int main()
{
   FILE *inp, *outp;
   int i, part_number, number_in_stock, nmax, smax;
   double price, pmax;

   inp=fopen("44.txt","r");
   outp=fopen("44_out.txt","w");
   fscanf(inp,"%d%lf%d",&part_number,&price,&number_in_stock);

    fprintf(outp,"%5d\t%11.2f\t%5d\n",part_number,price*1.15,num
    ber_in_stock);
   smax=number_in_stock;
   nmax=part_number;
   pmax=price;
   for(i=1; i<20; i++)
   {

    fscanf(inp,"%d%lf%d",&part_number,&price,&number_in_stock);

    fprintf(outp,"%5d\t%11.2f\t%5d\n",part_number,price*1.15,num
    ber_in_stock);
      if(smax<number_in_stock)
      {
         smax=number_in_stock;
         nmax=part_number;
         pmax=price;
      }
   }
   fprintf(outp,"%d\n",nmax);
   fprintf(outp,"%.2f\n",pmax*1.15);
   fprintf(outp,"%d\n",smax);
   fclose(inp);
   fclose(outp);
   return 0;
}
```

```
45 #include <stdio.h>
   #include <stdlib.h>
   void insert(int x[], int size);
   int main()
   {
      int x[50], i=0, k, number, median;

      printf("請輸入一整數 N (0<N<100, -99 to end):");
      scanf("%d",&number);
      while(number!=-99)
      {
         x[i++]=number;
         insert(x,i);
         printf("已輸入數字(由小到大排序):");
         for(k=0; k<i; k++)
            printf("%3d",x[k]);
         if(i%2==0)
            median=(x[i/2-1]+x[i/2])/2;
         else
            median=x[(i-1)/2];
         printf("\n 已輸入數字的中間數:%d\n",median);
         printf("請輸入一整數 N(0<N<100, -99 to end):");
         scanf("%d",&number);
      }
        return 0;
   }
   void insert(int x[], int size)
   {
      int i, j, key;
      key=x[size-1];
      for(j=size-2; j>=0 && key<x[j]; j--)
         x[j+1]=x[j];
      x[j+1]=key;
   }
```

考試版本

```
#include <stdio.h>
void insert(int x[], int size);
int main()
{
   int x[50], i=0, k, number, median;

   scanf("%d",&number);
   while(number!=-99)
   {
      x[i++]=number;
      insert(x,i);
      for(k=0; k<i; k++)
         printf("%3d",x[k]);
      if(i%2==0)
         median=(x[i/2-1]+x[i/2])/2;
      else
         median=x[(i-1)/2];
      printf("\n%d\n",median);
      scanf("%d",&number);
   }
     return 0;
}
void insert(int x[], int size)
{
   int i, j, key;
   key=x[size-1];
   for(j=size-2; j>=0 && key<x[j]; j--)
      x[j+1]=x[j];
   x[j+1]=key;
}
```

46
```c
#include <stdio.h>
#include <ctype.h>
#include <string.h>
int main(void)
{
    char s[1001];
    int i, num[26]={0};
    printf("請輸入一串英文字母：");
    scanf("%s",s);
    for(i=0;i<strlen(s);i++){
        s[i] = toupper(s[i]);
        num[s[i]-'A']++;
    }
    for(i=0;i<26;i++)
        if(num[i]!=0)
            printf("%c:%d\n",'A'+i,num[i]);
    return 0;
}
```

考試版本

```c
#include <stdio.h>
#include <ctype.h>
#include <string.h>
int main(void)
{
    char s[1001];
    int i, num[26]={0};
    scanf("%s",s);
    for(i=0;i<strlen(s);i++){
        s[i] = toupper(s[i]);
        num[s[i]-'A']++;
    }
    for(i=0;i<26;i++)
        if(num[i]!=0)
            printf("%c %d\n",'A'+i,num[i]);
    return 0;
}
```

```
47 #include <stdio.h>
   int main()
   {
      FILE *fp;
      char filen[81], ch;
      int nnum, nupper, nlower;
         nnum=nupper=nlower=0;
      printf("Input file name = ");
      gets(filen);
      fp=fopen(filen,"rb");
      if(fp==NULL)
      {
         puts("\n!!! File not found !!!\n");
         return -1;
      }
      while((ch=fgetc(fp))!=EOF)
      {
         if( ch>='0' && ch <='9' ) nnum++;
         else if( ch>='A' && ch<='Z') nupper++;
         else if( ch>='a' && ch<='z') nlower++;
      }
     fclose(fp);
     printf(" # of Numerical characters = %d\n",nnum);
     printf(" # of Upper-case characters = %d\n",nupper);
     printf(" # of Lower-case characters = %d",nlower);
     return 0;
   }
```

考試版本

```
#include <stdio.h>
int main()
{
   FILE *fp;
   char filen[81], ch;
   int nnum, nupper, nlower;
      nnum=nupper=nlower=0;
   gets(filen);
   fp=fopen(filen,"rb");
   if(fp==NULL)
   {
      puts("\n!!! File not found !!!\n");
      return -1;
   }
   while((ch=fgetc(fp))!=EOF)
   {
      if( ch>='0' && ch <='9' ) nnum++;
      else if( ch>='A' && ch<='Z') nupper++;
      else if( ch>='a' && ch<='z') nlower++;
   }
  fclose(fp);
  printf("%d\n",nnum);
  printf("%d\n",nupper);
  printf("%d",nlower);
  return 0;
}
```

48
```c
#include <stdio.h>
#include <stdlib.h>
int main()
{
   int n, i, j, k, grade[50], rank[50];
   printf("請輸入學生人數：");
   scanf("%d",&n);
   for(i=0; i<n; i++)
   {
      printf("請輸入第%d 位學生的成績：",i+1);
      scanf("%d",&grade[i]);
   }
   for(i=0; i<n; i++)
   {
      k=1;
      for(j=0; j<n; j++)
         if(grade[j]>grade[i])
            k++;
      rank[i]=k;
   }
   printf("成績\t 名次\n");
   for(i=0; i<n; i++)
      printf("%3d\t%3d\n",grade[i],rank[i]);
    return 0;
}
```

考試版本

```c
#include <stdio.h>
int main()
{
   int n, i, j, k, grade[50], rank[50];
   scanf("%d",&n);
   for(i=0; i<n; i++)
   {
      scanf("%d",&grade[i]);
   }
   for(i=0; i<n; i++)
   {
      k=1;
      for(j=0; j<n; j++)
         if(grade[j]>grade[i])
            k++;
      rank[i]=k;
   }
    for(i=0; i<n; i++)
      printf("%3d\t%3d\n",grade[i],rank[i]);
    return 0;
}
```

49
```
#include <stdio.h>
void convert(char *strp);
int main()
{
   char str[81];
   printf("請輸入一字串：");
   gets(str);
   convert(str);
   printf("大小寫轉換後的字串:");
   puts(str);
   return 0;
}

void convert(char *strp)
{
   int i;
   for(i=0; *(strp+i)!='\0'; i++)
      if(*(strp+i)>='A' && *(strp+i)<='Z')
        *(strp+i)=*(strp+i)+32;
      else if (*(strp+i)>='a' && *(strp+i)<='z')
        *(strp+i)=*(strp+i)-32;
}
```

考試版本

```
#include <stdio.h>
void convert(char *strp);
int main()
{
   char str[81];
   gets(str);
   convert(str);
   puts(str);
   return 0;
}

void convert(char *strp)
{
   int i;
   for(i=0; *(strp+i)!='\0'; i++)
      if(*(strp+i)>='A' && *(strp+i)<='Z')
        *(strp+i)=*(strp+i)+32;
      else if (*(strp+i)>='a' && *(strp+i)<='z')
        *(strp+i)=*(strp+i)-32;
}
```

50
```c
#include <stdio.h>
#include <stdlib.h>
int main()
{
   unsigned long a, b, c=0, k=0;

   printf("請輸入A：");
   scanf("%ld",&a);
   printf("請輸入B：");
   scanf("%ld",&b);
   while(a!=0 || b!=0)
   {
      if(a%10+b%10+c>=10)
      {
         k=k+1;
         c=1;
      }
      else
         c=0;
      a=a/10;
      b=b/10;
   }
   printf("A+B時產生了%d次進位\n",k);
   return 0;
}
```

考試版本

```c
#include <stdio.h>
int main()
{
   unsigned long a, b, c=0, k=0;

   scanf("%ld",&a);
   scanf("%ld",&b);
   while(a!=0 || b!=0)
   {
      if(a%10+b%10+c>=10)
      {
         k=k+1;
         c=1;
      }
      else
         c=0;
      a=a/10;
      b=b/10;
   }
   printf("%d\n",k);
   return 0;
}
```

51
```
#include <stdio.h>
#include <stdlib.h>
#include <ctype.h>
#include <conio.h>
int main()
{
   FILE *inp;
   int word=0, character=0, count=0;
   char c;

   inp=fopen("51.txt","r");
   while((c=getc(inp))!=EOF)
   {
      if(c!=' ' && isalnum(c))
      {
         character++;
         count++;
       }
      else
         count=0;
      if(count==1) word++;
   }
   printf("%d characters \n",character);
   printf("%d words \n",word);
   fclose(inp);
   return 0;
}
```

考試版本

```
#include <stdio.h>
#include <ctype.h>
int main()
{
   FILE *inp;
   int word=0, character=0, count=0;
   char c;

   inp=fopen("51.txt","r");
   while((c=getc(inp))!=EOF)
   {
      if(c!=' ' && isalnum(c))
      {
         character++;
         count++;
       }
      else
         count=0;
      if(count==1) word++;
   }
   printf("%d\n",character);
   printf("%d\n",word);
   fclose(inp);
   return 0;
}
```

```c
52 #include <stdio.h>
   #include <stdlib.h>
   int main()
   {
      FILE *inp;
      char team[6][10];
      int play[7][9]={0}, i, j;
      int team_max, play_max, index_max;

      inp=fopen("52.txt","r");
      for(i=0; i<6; i++)
      {
         fscanf(inp,"%s",team[i]);
         for(j=0; j<8; j++)
            fscanf(inp,"%d",&play[i][j]);
      }
      for(i=0; i<6; i++)
         for(j=0; j<8; j++)
            play[i][8]+=play[i][j];
      for(i=0; i<8; i++)
         for(j=0; j<6; j++)
            play[6][i]+=play[j][i];
      team_max=play[0][8];
      index_max=0;
      for(i=1; i<6; i++)
         if(team_max<play[i][8])
         {
            team_max=play[i][8];
            index_max=i;
         }
      printf("%s 隊的安打數最多\n",team[index_max]);
      play_max=play[6][0];
      index_max=0;
      for(i=1; i<8; i++)
         if(play_max<play[6][i])
         {
            play_max=play[6][i];
            index_max=i;
         }
      printf("第%d 場的安打數最多\n",index_max+1);
      fclose(inp);
      return 0;
   }
```

考試版本

```
#include <stdio.h>
int main()
{
   FILE *inp;
   char team[6][10];
   int play[7][9]={0}, i, j;
   int team_max, play_max, index_max;

   inp=fopen("52.txt","r");
   for(i=0; i<6; i++)
   {
      fscanf(inp,"%s",team[i]);
      for(j=0; j<8; j++)
         fscanf(inp,"%d",&play[i][j]);
   }
   for(i=0; i<6; i++)
      for(j=0; j<8; j++)
         play[i][8]+=play[i][j];
   for(i=0; i<8; i++)
      for(j=0; j<6; j++)
         play[6][i]+=play[j][i];
   team_max=play[0][8];
   index_max=0;
   for(i=1; i<6; i++)
      if(team_max<play[i][8])
      {
         team_max=play[i][8];
         index_max=i;
      }
   printf("%s\n",team[index_max]);
   play_max=play[6][0];
   index_max=0;
   for(i=1; i<8; i++)
      if(play_max<play[6][i])
      {
         play_max=play[6][i];
         index_max=i;
      }
   printf("%d\n",index_max+1);
   fclose(inp);
   return 0;
}
```

```
53 #include <stdio.h>
   struct student
   {
      int id;
      char name[21];
      char grade;
   };
   typedef struct student STU;
   void search(STU*,int,int);
   int main()
   {
      FILE *inp;
      STU info[70], found;
      int i=0, no;

      inp=fopen("53.txt","r");
      //  注意： "%d%s %c"需空隔
      while(fscanf(inp,"%d%s
   %c",&info[i].id,info[i].name,&info[i].grade)!=EOF)
         i++;
      printf("請輸入欲尋找的學號：");
      scanf("%d",&no);
      search(info,i,no);
      fclose(inp);
      return 0;
   }
   void search(STU info[], int size, int key)
   {
      int i;
      for(i=0; i<size; i++)
      {
         if(info[i].id==key)
            break;
      }
      if(i==size)
         printf("0\n");
      else
   printf("%d\t%s\t%c\n",info[i].id,info[i].name,info[i].grade);
   }
```

考試版本

```
#include <stdio.h>
struct student
{
   int id;
   char name[21];
   char grade;
};
typedef struct student STU;
void search(STU*,int,int);
int main()
{
   FILE *inp;
   STU info[70], found;
   int i=0, no;

   inp=fopen("53.txt","r");
    //  注意： "%d%s %c"需空隔
   while(fscanf(inp,"%d%s
%c",&info[i].id,info[i].name,&info[i].grade)!=EOF)
      i++;
   scanf("%d",&no);
   search(info,i,no);
   fclose(inp);
   return 0;
}
void search(STU info[], int size, int key)
{
   int i;
   for(i=0; i<size; i++)
   {
      if(info[i].id==key)
         break;
   }
   if(i==size)
      printf("0\n");
   else

printf("%d\t%s\t%c\n",info[i].id,info[i].name,info[i].grade);
}
```

```c
#include <stdio.h>
int main()
{
   int a[10][10], b[10][10], c[10][10];
   int m, n, i, j;

   printf("請輸入矩陣 A 的列數：");
   scanf("%d",&m);
   printf("請輸入矩陣 A 的行數：");
   scanf("%d",&n);
   printf("請輸入矩陣 A:\n");
   for(i=0; i<m; i++)
      for(j=0; j<n; j++)
      {
         scanf("%d",&a[i][j]);
         b[i][n-j-1]=a[i][j];
         c[j][i]=a[i][j];
      }
   printf("矩陣 A 的反射矩陣為\n");
   for(i=0; i<m; i++)
   {
      for(j=0; j<n; j++)
         printf("%4d",b[i][j]);
      printf("\n");
   }
   printf("矩陣 A 的轉置矩陣為\n");
   for(i=0; i<n; i++)
   {
      for(j=0; j<m; j++)
         printf("%4d",c[i][j]);
      printf("\n");
   }
   return 0;
}
```

考試版本

```
#include <stdio.h>
int main()
{
   int a[10][10], b[10][10], c[10][10];
   int m, n, i, j;

   scanf("%d",&m);
   scanf("%d",&n);
   for(i=0; i<m; i++)
      for(j=0; j<n; j++)
      {
         scanf("%d",&a[i][j]);
         b[i][n-j-1]=a[i][j];
         c[j][i]=a[i][j];
      }
  for(i=0; i<m; i++)
   {
      for(j=0; j<n; j++)
         printf("%4d",b[i][j]);
      printf("\n");
   }
   for(i=0; i<n; i++)
   {
      for(j=0; j<m; j++)
         printf("%4d",c[i][j]);
      printf("\n");
   }
   return 0;
}
```

```c
#include <stdio.h>
int main()
{
   int a[10][10], b[10][10], c[10][10]={0};
   int ma, na, mb, nb, i, j, k;

   printf("請輸入矩陣A的列數：");
   scanf("%d",&ma);
   printf("請輸入矩陣A的行數：");
   scanf("%d",&na);
   printf("請輸入矩陣A:\n");
   for(i=0; i<ma; i++)
      for(j=0; j<na; j++)
         scanf("%d",&a[i][j]);
   printf("請輸入矩陣B的列數：");
   scanf("%d",&mb);
   printf("請輸入矩陣B的行數：");
   scanf("%d",&nb);
   printf("請輸入矩陣B:\n");
   for(i=0; i<mb; i++)
      for(j=0; j<nb; j++)
         scanf("%d",&b[i][j]);
   if(na!=mb)
      printf("0\n");
   else
   {
      for(i=0; i<ma; i++)
         for(j=0; j<nb; j++)
            for(k=0; k<na; k++)
               c[i][j]+=a[i][k]*b[k][j];
      printf("矩陣AxB的結果為\n");
      for(i=0; i<ma; i++)
      {
         for(j=0; j<nb; j++)
            printf("%4d",c[i][j]);
         printf("\n");
      }
   }
     return 0;
}
```

考試版本

```
#include <stdio.h>
int main()
{
   int a[10][10], b[10][10], c[10][10]={0};
   int ma, na, mb, nb, i, j, k;

   scanf("%d",&ma);
   scanf("%d",&na);
   for(i=0; i<ma; i++)
      for(j=0; j<na; j++)
         scanf("%d",&a[i][j]);
   scanf("%d",&mb);
   scanf("%d",&nb);
   for(i=0; i<mb; i++)
      for(j=0; j<nb; j++)
         scanf("%d",&b[i][j]);
   if(na!=mb)
      printf("0\n");
   else
   {
      for(i=0; i<ma; i++)
         for(j=0; j<nb; j++)
            for(k=0; k<na; k++)
               c[i][j]+=a[i][k]*b[k][j];
      for(i=0; i<ma; i++)
      {
         for(j=0; j<nb; j++)
            printf("%4d",c[i][j]);
         printf("\n");
      }
   }
     return 0;
}
```

```
56 #include <stdio.h>
   #include <string.h>
   void upper(char*);
   int main()
   {
      char s[100][1024], t[1024], str1[1024], str2[1024];
      int n=0, i=0, j=0;

      while(scanf("%s",s[i++])){
         if(strcmp(s[i-1],"END")==0){
            strcpy(s[--i],"");
            break;
         }
      }
      n=i;
      for(i=0; i<n; i++){
         for(j=0; j<n; j++){
            upper(strcpy(str1,s[i]));
            upper(strcpy(str2,s[j]));
            if(strcmp(str1,str2)>0)
            {
               strcpy(t,s[i]);
               strcpy(s[i],s[j]);
               strcpy(s[j],t);
            }
         }
      }
      i=0;
      printf("由大至小排序\n");
      while(strlen(s[i])!=0)
         printf("%s\n",s[i++]);
      return 0;
   }

   void upper(char strp[])
   {
      int i;
      for(i=0; strp[i]!='\0'; i++)
         if(strp[i]>='a' && strp[i]<='z')
            strp[i]=strp[i]-'a'+'A';
      return;
   }
```

考試版本

```
#include <stdio.h>
#include <string.h>
void upper(char*);
int main()
{
   char s[100][1024], t[1024], str1[1024], str2[1024];
   int n=0, i=0, j=0;

   while(scanf("%s",s[i++])){
      if(strcmp(s[i-1],"END")==0){
         strcpy(s[--i],"");
         break;
      }
   }
   n=i;
   for(i=0; i<n; i++){
      for(j=0; j<n; j++){
         upper(strcpy(str1,s[i]));
         upper(strcpy(str2,s[j]));
         if(strcmp(str1,str2)>0)
         {
            strcpy(t,s[i]);
            strcpy(s[i],s[j]);
            strcpy(s[j],t);
         }
       }
    }
    i=0;
    while(strlen(s[i])!=0)
       printf("%s\n",s[i++]);
    return 0;
}

void upper(char strp[])
{
   int i;
   for(i=0; strp[i]!='\0'; i++)
      if(strp[i]>='a' && strp[i]<='z')
         strp[i]=strp[i]-'a'+'A';
   return;
}
```

```c
#include <stdio.h>
#include <string.h>
void convert(long,char*);
void reverse(char*);
int main()
{
    int i,len;
    long decimal;
    char hex[11];

    printf("請輸入一個十進位的正整數：");
    scanf("%ld",&decimal);
    convert(decimal,hex);
    printf("轉成十六進位=%s\n",hex);
    len=strlen(hex);
    for(i=1;i<=len;i++)
        printf("第%d位數為%c\n",i, hex[len-i]);
    return 0;
}

void convert(long decimal, char hex[])
{
    int i,digit;
    i=0;
    while(decimal>=16){
        digit=decimal%16;
        decimal/=16;
        hex[i]=(digit>=10)? digit-10+'A': digit+'0';
        i++;
    }
    hex[i]=(decimal>=10)? decimal-10+'A': decimal+'0';
    hex[i+1]='\0';
    reverse(hex);
    return;
}

void reverse(char hex[])
{
    int start=0,end=strlen(hex)-1;
    char temp;
    while(start < end){
      temp = hex[start];
      hex[start++] = hex[end];
      hex[end--] = temp;
    }
    return;
}
```

考試版本

```
#include <stdio.h>
#include <string.h>
void convert(long,char*);
void reverse(char*);
int main()
{
    int i,len;
    long decimal;
    char hex[11];

    scanf("%ld",&decimal);
    convert(decimal,hex);
    printf("%s\n",hex);
    len=strlen(hex);
    for(i=1;i<=len;i++)
        printf("%c\n",hex[len-i]);
    return 0;
}

void convert(long decimal, char hex[])
{
    int i,digit;
    i=0;
    while(decimal>=16){
        digit=decimal%16;
        decimal/=16;
        hex[i]=(digit>=10)? digit-10+'A': digit+'0';
        i++;
    }
    hex[i]=(decimal>=10)? decimal-10+'A': decimal+'0';
    hex[i+1]='\0';
    reverse(hex);
    return;
}

void reverse(char hex[])
{
    int start=0,end=strlen(hex)-1;
    char temp;
    while(start < end){
      temp = hex[start];
      hex[start++] = hex[end];
      hex[end--] = temp;
    }
    return;
}
```

```c
#include <stdio.h>
#include <string.h>
void convert(long,char*,int);
void reverse(char*);
int main()
{
    long decimal;
    char val[31];
    int r;

    printf("請輸入一個十進位的正整數：");
    scanf("%ld",&decimal);
    printf("請輸入r值：");
    scanf("%d",&r);
    convert(decimal,val,r);
    printf("轉成%d進位=%s\n",r,val);
    return 0;
}

void convert(long decimal, char val[], int r)
{
    int i,digit;
    i=0;
    while(decimal>=r){
        digit=decimal%r;
        decimal/=r;
        val[i]=(digit>=10)? digit-10+'A': digit+'0';
        i++;
    }
    val[i]=(decimal>=10)? decimal-10+'A': decimal+'0';
    val[i+1]='\0';
    reverse(val);
    return;
}

void reverse(char hex[])
{
    int start=0,end=strlen(hex)-1;
    char temp;
    while(start < end){
      temp = hex[start];
      hex[start++] = hex[end];
      hex[end--] = temp;
    }
    return;
}
```

考試版本

```
#include <stdio.h>
#include <string.h>
void convert(long,char*,int);
void reverse(char*);
int main()
{
    long decimal;
    char val[31];
    int r;

    scanf("%ld",&decimal);
    scanf("%d",&r);
    convert(decimal,val,r);
    printf("%s\n",val);
    return 0;
}

void convert(long decimal, char val[], int r)
{
    int i,digit;
    i=0;
    while(decimal>=r){
        digit=decimal%r;
        decimal/=r;
        val[i]=(digit>=10)? digit-10+'A': digit+'0';
        i++;
    }
    val[i]=(decimal>=10)? decimal-10+'A': decimal+'0';
    val[i+1]='\0';
    reverse(val);
    return;
}

void reverse(char hex[])
{
    int start=0,end=strlen(hex)-1;
    char temp;
    while(start < end){
      temp = hex[start];
      hex[start++] = hex[end];
      hex[end--] = temp;
    }
    return;
}
```

59
```c
#include <stdio.h>
int main()
{
   int bin[30], i=0, c=0, n;
   long decimal;

   printf("請輸入一個十進位的正整數：");
   scanf("%ld",&decimal);
   while(decimal>=2){
      bin[i++]=decimal%2;
      decimal/=2;
   }
   bin[i]=decimal;
   n=i;
   printf("轉成二進位數字=");
   for(i=n; i>=0; i--){
      printf("%d",bin[i]);
      if(bin[i]==1)
         c++;
   }
   printf("\n有 %d bit(s)為1\n",c);
   if(n!=0){
      printf("bit{");
      for(i=0; i<=n; i++)
         if(bin[i]==1)
            printf("%d,",i);
      printf("\b}為1\n");
   }
    return 0;
}
```

考試版本

```c
#include <stdio.h>
int main()
{
   int bin[30], i=0, c=0, n;
   long decimal;

   scanf("%ld",&decimal);
   while(decimal>=2){
      bin[i++]=decimal%2;
      decimal/=2;
   }
   bin[i]=decimal;
   n=i;
   for(i=n; i>=0; i--){
      printf("%d",bin[i]);
      if(bin[i]==1)
         c++;
   }
   printf("\n%d\n",c);
   if(n!=0){
      for(i=0; i<=n; i++)
         if(bin[i]==1)
            printf("%d,",i);
     }
    return 0;
}
```

```c
#include <stdio.h>
#include <math.h>
double mean(double x[], int size);
double variation(double x[], double avg, int size);
int main()
{
   double data[50], avg, var;
   int i, n;

   printf("請輸入資料個數：");
   scanf("%d",&n);
   printf("請輸入資料：");
   for(i=0; i<n; i++)
      scanf("%lf",&data[i]);
   avg=mean(data,n);
   var=variation(data,avg,n);
   printf("平均值為%f\n",avg);
   printf("平均偏差為%f\n",var);
   return 0;
}
double mean(double x[], int size)
{
   int i;
   double s=0;
   for(i=0; i<size; i++)
      s+=x[i];
   return s/size;
}
double variation(double x[], double avg, int size)
{
   int i;
   double s=0;
   for(i=0; i<size; i++)
      s+=fabs(x[i]-avg);
   return s/size;
}
```

考試版本

```
#include <stdio.h>
#include <math.h>
double mean(double x[], int size);
double variation(double x[], double avg, int size);
int main()
{
   double data[50], avg, var;
   int i, n;

   scanf("%d",&n);
   for(i=0; i<n; i++)
      scanf("%lf",&data[i]);
   avg=mean(data,n);
   var=variation(data,avg,n);
   printf("%f\n",avg);
   printf("%f\n",var);
   return 0;
}
double mean(double x[], int size)
{
   int i;
   double s=0;
   for(i=0; i<size; i++)
      s+=x[i];
   return s/size;
}
double variation(double x[], double avg, int size)
{
   int i;
   double s=0;
   for(i=0; i<size; i++)
      s+=fabs(x[i]-avg);
   return s/size;
}
```

==========

【難組參考程式】

61
```
#include <stdio.h>
#include <stdlib.h>
int main()
{
   int data[50], len[50];
   int i, j, n, max=0;

   printf("請輸入資料個數：");
   scanf("%d",&n);
   printf("請輸入資料：");
   for(i=0; i<n; i++)
      scanf("%d",&data[i]);
   for(i=0; i<n; i++)
      len[i]=1;
   for(i=0; i<n; i++)
   {
      for(j=0; j<i; j++)
         if((data[i]>data[j])&&(len[i]<=len[j]))
            len[i]=len[j]+1;
      if(max<len[i])
         max=len[i];
   }
   printf("最長遞增子序列的長度為 %d\n",max);
   return 0;
}
```

考試版本

```
#include <stdio.h>
int main()
{
   int data[50], len[50];
   int i, j, n, max=0;

   scanf("%d",&n);
   for(i=0; i<n; i++)
      scanf("%d",&data[i]);
   for(i=0; i<n; i++)
      len[i]=1;
   for(i=0; i<n; i++)
   {
      for(j=0; j<i; j++)
         if((data[i]>data[j])&&(len[i]<=len[j]))
            len[i]=len[j]+1;
      if(max<len[i])
         max=len[i];
   }
   printf("%d\n",max);
   return 0;
}
```

62
```
#include <stdio.h>
#include <stdlib.h>
int coun=1;
void hanoi(int i, char a, char b, char c);
int main()
{
   int i;
   char a='A', b='B', c='C';

   printf("Please input how many disk(s)：");
   scanf("%d",&i);
   hanoi(i,a,b,c);

   return 0;
}
void hanoi(int i, char a, char b, char c)
{
   if(i>0)
   {
      hanoi(i-1,a,c,b);
      printf("(%d) move %d from %c to %c\n",coun++,i,a,c);
      hanoi(i-1,b,a,c);
   }
}
```

考試版本

```
#include <stdio.h>
int coun=1;
void hanoi(int i, char a, char b, char c);
int main()
{
   int i;
   char a='A', b='B', c='C';

   scanf("%d",&i);
   hanoi(i,a,b,c);

   return 0;
}
void hanoi(int i, char a, char b, char c)
{
   if(i>0)
   {
      hanoi(i-1,a,c,b);
      printf("(%d) %d %c %c\n",coun++,i,a,c);
      hanoi(i-1,b,a,c);
   }
}
```

```
63 #include <stdio.h>
   #include <stdlib.h>
   int *array;
   int narr=0;
   void partition(int n);
   int main()
   {
      int n;

      printf("請輸入正整數 n：");
      scanf("%d",&n);
      array=(int *)malloc(n*sizeof(int));
      partition(n);
      free(array);

      return 0;
   }
   void partition(int n)
   {
      int i;
      if (n)
      {
         for(i=n; i>0; --i)
            if(!narr || i<=array[narr-1])
            {
               array[narr++]=i;
               partition(n-i);
               --narr;
            }
      }
     else
     {
        printf("%d",array[0]);
        for (i=1; i<narr; ++i)
           printf(",%d",array[i]);
        printf("\n");
     }
   }
```

考試版本

```
#include <stdio.h>
#include <stdlib.h>
int *array;
int narr=0;
void partition(int n);
int main()
{
   int n;

   scanf("%d",&n);
   array=(int *)malloc(n*sizeof(int));
   partition(n);
   free(array);

   return 0;
}
void partition(int n)
{
   int i;
   if (n)
   {
      for(i=n; i>0; --i)
         if(!narr || i<=array[narr-1])
         {
            array[narr++]=i;
            partition(n-i);
            --narr;
         }
   }
  else
  {
     printf("%d",array[0]);
     for (i=1; i<narr; ++i)
        printf(",%d",array[i]);
     printf("\n");
  }
}
```

```
64 #include <stdio.h>
   #include <stdlib.h>
   struct employee
   {
      int id;
      int base;
      int sales;
      int bonus;
      int salary;
   };
   typedef struct employee EMP;
   void bubble_sort(EMP x[], int n);
   int main()
   {
      FILE *inp, *outp;
      EMP data[20];
      int i, j, n;

      inp=fopen("64.txt","r");
      outp=fopen("64_out.txt","w");
      for(i=0; i<20; i++)

   fscanf(inp,"%d%d%d",&data[i].id,&data[i].base,&data[i].sales);
      for(i=0; i<20; i++)
      {
         if(data[i].sales<100000)
            data[i].bonus=0;
         else if(data[i].sales<200000)
            data[i].bonus=1000;
         else if(data[i].sales<300000)
            data[i].bonus=3000;
         else if(data[i].sales<400000)
            data[i].bonus=5000;
         else
            data[i].bonus=10000;
         data[i].salary=data[i].base+data[i].bonus;
      }
      fprintf(outp,"%4s%8s%12s%12s%8s\n",\
         "編號","底薪","銷售金額","業績獎金","薪水");
      bubble_sort(data,20);
```

```
   for(i=0; i<20; i++)
      fprintf(outp,"%4d%8d%12d%12d%8d\n",    \

data[i].id,data[i].base,data[i].sales,data[i].bonus,data[i].sal
ary);
   fclose(inp);
   fclose(outp);
   return 0;
}
void bubble_sort(EMP x[], int n)
{
   int i, j, tag;
   EMP temp;
   for(i=n-1; i>0 ; i-- )
   {
      tag=0;
      for(j=0; j<=i-1; j++)
         if(x[j].id > x[j+1].id)
         {
            temp=x[j];
            x[j]=x[j+1];
            x[j+1]=temp;
            tag=1;
         }
      if (tag==0)
         break;
   }
}
```

考試版本

```
#include <stdio.h>
struct employee
{
   int id;
   int base;
   int sales;
   int bonus;
   int salary;
};
typedef struct employee EMP;
void bubble_sort(EMP x[], int n);
int main()
{
   FILE *inp, *outp;
   EMP data[20];
   int i, j, n;

   inp=fopen("64.txt","r");
   outp=fopen("64_out.txt","w");
   for(i=0; i<20; i++)

fscanf(inp,"%d%d%d",&data[i].id,&data[i].base,&data[i].sales);
   for(i=0; i<20; i++)
   {
      if(data[i].sales<100000)
         data[i].bonus=0;
      else if(data[i].sales<200000)
         data[i].bonus=1000;
      else if(data[i].sales<300000)
         data[i].bonus=3000;
      else if(data[i].sales<400000)
         data[i].bonus=5000;
      else
         data[i].bonus=10000;
      data[i].salary=data[i].base+data[i].bonus;
   }
   bubble_sort(data,20);
   for(i=0; i<20; i++)
      fprintf(outp,"%4d%8d%12d%12d%8d\n",    \
```

```
data[i].id,data[i].base,data[i].sales,data[i].bonus,data[i].sal
ary);
   fclose(inp);
   fclose(outp);
   return 0;
}
void bubble_sort(EMP x[], int n)
{
   int i, j, tag;
   EMP temp;
   for(i=n-1; i>0 ; i-- )
   {
      tag=0;
      for(j=0; j<=i-1; j++)
         if(x[j].id > x[j+1].id)
         {
            temp=x[j];
            x[j]=x[j+1];
            x[j+1]=temp;
            tag=1;
         }
      if (tag==0)
         break;
   }
}
```

65
```c
#include <stdio.h>
void fibnum(int,int);
int main()
{
    int n,m;
    printf("請輸入n, m：");
    scanf("%d %d",&n,&m);
    fibnum(n,m);
    return 0;
}
void fibnum(int n, int m)
{
    int i;
    double fib=0,tmp=1;
    if(n==0){
        printf("%.0f ",fib);
        n++;
    } else
        for(i=1;i<n;i++){
            fib=fib+tmp;
            tmp=fib-tmp;
        }
    for(i=n;i<=m;i++){
        fib=fib+tmp;
        tmp=fib-tmp;
        printf("%.0f ",fib);
    }
    return;
}
```

考試版本

```c
#include <stdio.h>
void fibnum(int,int);
int main()
{
    int n,m;
    scanf("%d %d",&n,&m);
    fibnum(n,m);
    return 0;
}

void fibnum(int n, int m)
{
    int i;
    double fib=0,tmp=1;
    if(n==0){
        printf("%.0f ",fib);
        n++;
    } else
        for(i=1;i<n;i++){
            fib=fib+tmp;
            tmp=fib-tmp;
        }
    for(i=n;i<=m;i++){
        fib=fib+tmp;
        tmp=fib-tmp;
        printf("%.0f ",fib);
    }
    return;
}
```

66
```c
#include <stdio.h>
#include <stdlib.h>
double commission(int price, int trade_in);
int main()
{
   FILE *inp;
   int price, trade_in;
   double bonus, total=0;

   inp=fopen("66.txt","r");
   printf("價格\t折價物\t獎金\n");
   printf("========================\n");
   while(fscanf(inp,"%d%d",&price,&trade_in)!=EOF)
   {
      bonus=commission(price,trade_in);
      printf("%d\t%d\t%.2f\n",price,trade_in,bonus);
      total=total+bonus;
   }
   printf("========================\n");
   printf("總獎金:%.2f\n",total);
   fclose(inp);

   return 0;
}
double commission(int price, int trade_in)
{
   double amount, bonus;
   amount=price-trade_in;
   if(amount<200)
      bonus=0;
   else if(amount<=2500)
      bonus=amount*0.1;
   else
      bonus=250+(amount-2500)*0.12;
   return bonus;
}
```

考試版本

```
#include <stdio.h>
double commission(int price, int trade_in);
int main()
{
   FILE *inp;
   int price, trade_in;
   double bonus, total=0;

   inp=fopen("66.txt","r");
   while(fscanf(inp,"%d%d",&price,&trade_in)!=EOF)
   {
      bonus=commission(price,trade_in);
      printf("%d\t%d\t%.2f\n",price,trade_in,bonus);
      total=total+bonus;
   }
   printf("%.2f\n",total);
   fclose(inp);

   return 0;
}
double commission(int price, int trade_in)
{
   double amount, bonus;
   amount=price-trade_in;
   if(amount<200)
      bonus=0;
   else if(amount<=2500)
      bonus=amount*0.1;
   else
      bonus=250+(amount-2500)*0.12;
   return bonus;
}
```

```
67 #include <stdio.h>
   #include <stdlib.h>
   #include <time.h>
   int main()
   {
      time_t t;
      struct tm *tp;
      int adultNum, childNum, rate;
      int adultFee, childFee, totalFee;
      int over3Discount, discountFee;

      while(1)
      {
         printf("輸入大人數：");
         scanf("%d",&adultNum);
         printf("輸入小孩數：");
         scanf("%d",&childNum);
         time(&t);
         tp=localtime(&t);
         if(tp->tm_wday!=0 && tp->tm_wday!=6)
            if(tp->tm_hour<17 || (tp->tm_hour==17 && tp->tm_min<=30))
            {
               adultFee=268;
               childFee=120;
            }
            else
            {
               adultFee=368;
               childFee=150;
            }
         else
         {
            adultFee=368;
            childFee=150;
         }
         printf("%d-%d-%d   %d:%d\n",   \

   1900+tp->tm_year,tp->tm_mon+1,tp->tm_mday,tp->tm_hour,tp->tm_mi
   n);
         if(adultNum!=0)
```

```
        printf("     大     人                          %d*%d=%d      元
\n",adultNum,adultFee,adultNum*adultFee);
     if(childNum!=0)
        printf("     小     孩                          %d*%d=%d      元
\n",childNum,childFee,childNum*childFee);
     printf("10%%服務費   %d 元\n",   \
        (int)((adultNum*adultFee + childNum*childFee)*0.1));
     totalFee=(adultNum*adultFee + childNum*childFee)*1.1;
     printf("原價 %d 元\n",totalFee);
     over3Discount=(adultNum+childNum)/3;
     if(over3Discount>0)
     {
        if(childNum>over3Discount)
           discountFee=over3Discount*childFee;
        else
           discountFee=(over3Discount-childNum)*adultFee        +
childNum*childFee;
        totalFee -= discountFee;
        printf("三人同行方案 折扣 %d 元\n", discountFee);
     }
     if(childNum+adultNum>=10)
     {
        discountFee = totalFee*0.05;
        totalFee -=  discountFee;
        printf("十人以上方案 折扣 %d 元\n", discountFee);
     }
     printf("--------------------------\n");
     printf("總計 %d 元\n\n", totalFee);
     do
     {
        printf("\n 輸入下一位(1)或離開(0):");
        scanf("%d",&rate);
        if(rate==0)
           exit(0);
     }while(rate!=1);
  }
  return 0;
}
```

考試版本

```
#include <stdio.h>
#include <time.h>
int main()
{
   time_t t;
   struct tm *tp;
   int adultNum, childNum, rate;
   int adultFee, childFee, totalFee;
   int over3Discount, discountFee;

      scanf("%d",&adultNum);
      scanf("%d",&childNum);
      time(&t);
      tp=localtime(&t);
      if(tp->tm_wday!=0 && tp->tm_wday!=6)
         if(tp->tm_hour<17 || (tp->tm_hour==17 && tp->tm_min<=30))
         {
            adultFee=268;
            childFee=120;
         }
         else
         {
            adultFee=368;
            childFee=150;
         }
      else
      {
         adultFee=368;
         childFee=150;
      }
      printf("%d-%d-%d   %d:%d\n",   \

1900+tp->tm_year,tp->tm_mon+1,tp->tm_mday,tp->tm_hour,tp->tm_mi
n);
      if(adultNum!=0)
         printf("%d\n",adultNum*adultFee);
      if(childNum!=0)
         printf("%d\n",childNum*childFee);
      printf("%d\n",   \
```

```
        (int)((adultNum*adultFee + childNum*childFee)*0.1));
      totalFee=(adultNum*adultFee + childNum*childFee)*1.1;
      printf("%d\n",totalFee);
      over3Discount=(adultNum+childNum)/3;
      if(over3Discount>0)
      {
        if(childNum>over3Discount)
          discountFee=over3Discount*childFee;
        else
          discountFee=(over3Discount-childNum)*adultFee        +
childNum*childFee;
        totalFee -= discountFee;
        printf("%d\n", discountFee);
      }
      if(childNum+adultNum>=10)
      {
        discountFee = totalFee*0.05;
        totalFee -=  discountFee;
        printf("%d\n", discountFee);
      }
      printf("%d\n\n", totalFee);

   return 0;
}
```

```
#include <stdio.h>
#include <stdlib.h>
#include <math.h>
void scan_data(char *op, double *rp);
void do_next_op(char op, double r_op, double *cp);
int main()
{
   double r_op, acc=0;
   char op;

   scan_data(&op,&r_op);
   while(op!='q')
   {
      do_next_op(op,r_op,&acc);
      printf("result so far is %.3f\n",acc);
      scan_data(&op,&r_op);
   }
   printf("final result is  %.3f\n",acc);

   return 0;
}
void scan_data(char *op, double *rp)
{
   scanf(" %c",op);
   if(*op!='q')
      scanf("%lf",rp);
}
void do_next_op(char op, double r_op, double *cp)
{
   switch(op)
   {
      case '+':
         *cp=*cp+r_op;
         break;
      case '-':
         *cp=*cp-r_op;
         break;
      case '*':
         *cp=*cp*r_op;
         break;
      case '/':
         *cp=*cp/r_op;
         break;
      case '^':
         *cp=pow(*cp, r_op);
   }
}
```

考試版本

```
#include <stdio.h>
#include <math.h>
void scan_data(char *op, double *rp);
void do_next_op(char op, double r_op, double *cp);
int main()
{
   double r_op, acc=0;
   char op;

   scan_data(&op,&r_op);
   while(op!='q')
   {
      do_next_op(op,r_op,&acc);
      printf("%.3f\n",acc);
      scan_data(&op,&r_op);
   }
   printf("%.3f\n",acc);

   return 0;
}
void scan_data(char *op, double *rp)
{
   scanf(" %c",op);
   if(*op!='q')
      scanf("%lf",rp);
}
void do_next_op(char op, double r_op, double *cp)
{
   switch(op)
   {
      case '+':
         *cp=*cp+r_op;
         break;
      case '-':
         *cp=*cp-r_op;
         break;
      case '*':
         *cp=*cp*r_op;
         break;
      case '/':
         *cp=*cp/r_op;
         break;
      case '^':
         *cp=pow(*cp, r_op);
   }
}
```

69
```c
#include <stdio.h>
#include <stdlib.h>
int main()
{
   char q[1024], s[100][1024];
   int i=0, j=0, n=0, star=0, different;

   while(scanf("%s",s[i]))
   {
      for(j=0; j<strlen(s[i]); j++)
      {
         if(s[i][j]=='?')
         {
            strcpy(q,s[i]);
            break;
         }
      }
      if(j<strlen(s[i]))
         break;
      i=i+1;
   }
   n=i;
   printf("-----------------------\n");
   for(i=0; i<n; i++)
   {
      if(strlen(s[i])!=strlen(q))
         continue;
      different=0;
      for(j=0; j<strlen(s[i]); j++)
         if(q[j]!='?' && s[i][j]!=q[j])
         {
            different=1;
            break;
         }
      if(different==0)
         printf("%s\n",s[i]);
   }
      return 0;
}
```

考試版本

```
#include <stdio.h>
#include <string.h>
int main()
{
   char q[1024], s[100][1024];
   int i=0, j=0, n=0, star=0, different;

   while(scanf("%s",s[i]))
   {
      for(j=0; j<strlen(s[i]); j++)
      {
         if(s[i][j]=='?')
         {
            strcpy(q,s[i]);
            break;
         }
      }
      if(j<strlen(s[i]))
         break;
      i=i+1;
   }
   n=i;
   for(i=0; i<n; i++)
   {
      if(strlen(s[i])!=strlen(q))
         continue;
      different=0;
      for(j=0; j<strlen(s[i]); j++)
         if(q[j]!='?' && s[i][j]!=q[j])
         {
            different=1;
            break;
         }
      if(different==0)
         printf("%s\n",s[i]);
   }
      return 0;
}
```

70
```
#include <stdio.h>
#include <stdlib.h>
int number[3000]={1,2,3,4,5};
int base[3]={2,3,5};
int getugly(int order);
int main()
{
   int n;

   printf("鍵盤輸入 n：");
   scanf("%d",&n);
   printf("The %d\'th ugly number is %d\n",n,getugly(n)) ;
   return 0 ;
}

int getugly(int order)
{
   int count=4;
   int temp, i, j;
   int min;
   order--;
   if(order<5)
      return number[order];
   while(count<order)
   {
      min=0;
      for(i=0; i<count; i++)
      {
         for(j=0; j<3; j++)
         {
            temp=number[i]*base[j] ;
            if(temp<=number[count])
               continue ;
            else if(min==0 || min>temp)
               min=temp ;
         }
      }
      number[++count]=min ;
   }
   return number[order] ;
}
```

考試版本

```
#include <stdio.h>
int number[3000]={1,2,3,4,5};
int base[3]={2,3,5};
int getugly(int order);
int main()
{
   int n;

   scanf("%d",&n);
   printf("%d\n",getugly(n)) ;
   return 0 ;
}

int getugly(int order)
{
   int count=4;
   int temp, i, j;
   int min;
   order--;
   if(order<5)
      return number[order];
   while(count<order)
   {
      min=0;
      for(i=0; i<count; i++)
      {
         for(j=0; j<3; j++)
         {
            temp=number[i]*base[j] ;
            if(temp<=number[count])
               continue ;
            else if(min==0 || min>temp)
               min=temp ;
         }
      }
      number[++count]=min ;
   }
   return number[order] ;
}
```

```
71 #include <stdio.h>
   #include <stdlib.h>
   #include <string.h>
   int lcs(char *x, char *y, int mm, int nn);
   void output(char *x, int i, int j);
   int prev[100][100]={0};
   int lenth[100][100];
   int main()
   {
      char str1[111], str2[111];
      int m, n, len;

      printf("請輸入字串 A：");
      scanf("%s",&str1[1]);
      printf("請輸入字串 B：");
      scanf("%s",&str2[1]);
      m=strlen(&str1[1]);
      n=strlen(&str2[1]);
      len=lcs(str1,str2,m,n);
      printf("最長共同子序列長度為:%d\n",len);
      printf("A 與 B 的最長共同子序列為:");
      output(str1, m, n);
      printf("\n");

      return 0 ;
   }
   int lcs(char *x, char *y, int mm, int nn)
   {
      int i, j, m, n;
      m = mm;
      n = nn;
      for(i=0; i<=m; i++)
         lenth[i][0]=0;
      for(j=0; j<=n; j++)
         lenth[0][j]=0;
      for(i=1; i<=m; i++)
         for(j=1; j<=n; j++)
            if(x[i]==y[j])
            {
               lenth[i][j]=lenth[i-1][j-1] + 1;
               prev[i][j]=1;
```

```
        }
        else
        {
           if(lenth[i][j-1]>=lenth[i-1][j])
           {
              prev[i][j]=2;
              lenth[i][j]=lenth[i][j-1];
           }
           else
           {
              prev[i][j]=3;
              lenth[i][j]=lenth[i-1][j];
           }
        }
   return lenth[m][n];
}
void output(char *x, int i, int j)
{
   if(prev[i][j]==0) return;
   if(prev[i][j]==1)
   {
      output(x,i-1,j-1);
      printf("%c",x[i]);
   }
   else if(prev[i][j]==2)
      output(x,i,j-1);
   else if (prev[i][j]==3)
      output(x,i-1,j);
}
```

考試版本

```
#include <stdio.h>
#include <string.h>
int lcs(char *x, char *y, int mm, int nn);
void output(char *x, int i, int j);
int prev[100][100]={0};
int lenth[100][100];
int main()
{
   char str1[111], str2[111];
   int m, n, len;

   scanf("%s",&str1[1]);
   scanf("%s",&str2[1]);
   m=strlen(&str1[1]);
   n=strlen(&str2[1]);
   len=lcs(str1,str2,m,n);
   printf("%d\n",len);
   output(str1, m, n);
   printf("\n");

   return 0 ;
}
int lcs(char *x, char *y, int mm, int nn)
{
   int i, j, m, n;
   m = mm;
   n = nn;
   for(i=0; i<=m; i++)
      lenth[i][0]=0;
   for(j=0; j<=n; j++)
      lenth[0][j]=0;
   for(i=1; i<=m; i++)
      for(j=1; j<=n; j++)
         if(x[i]==y[j])
         {
            lenth[i][j]=lenth[i-1][j-1] + 1;
            prev[i][j]=1;
         }
         else
```

```
        {
          if(lenth[i][j-1]>=lenth[i-1][j])
          {
            prev[i][j]=2;
            lenth[i][j]=lenth[i][j-1];
          }
          else
          {
            prev[i][j]=3;
            lenth[i][j]=lenth[i-1][j];
          }
        }
   return lenth[m][n];
}
void output(char *x, int i, int j)
{
   if(prev[i][j]==0) return;
   if(prev[i][j]==1)
   {
      output(x,i-1,j-1);
      printf("%c",x[i]);
   }
   else if(prev[i][j]==2)
      output(x,i,j-1);
   else if (prev[i][j]==3)
      output(x,i-1,j);
}
```

```
72 #include <stdio.h>
   #include <stdlib.h>
   #include <string.h>
   #include <ctype.h>
   struct Sfreq
   {
      char str[1024];
      int freq;
   };
   int main()
   {
      char s[61], text[1024]="";
      int n, i, j, k, index=0, found=0;
      struct Sfreq v[1024];

      printf("請輸入出現次數：");
      scanf("%d",&n);
      printf("請輸入文章本文：\n");
      while(scanf("%s",s) && strcmp(s,"EndOfText")!=0)
      {
         for(i=0; i<strlen(s); i++)
         {
            if(!isalpha(s[i]))
               s[i]=' ';
            if(!islower(s[i]))
               s[i]=tolower(s[i]);
         }
         if(strcmp(s," ")!=0)
         {
            strcat(text,s);
            strcat(text," ");
         }
      }
      printf("--------------------------------------\n");
      j=0;
      for(i=0; i<strlen(text); i++)
      {
         if(text[i]!=' ')
            s[j++]=text[i];
         else
```

```
      {
         found=0;
         s[j]='\0';
         j=0;
         for(k=0; k<index; k++)
            if(strcmp(v[k].str,s)==0)
            {
               v[k].freq++;
               found=1;
            }
         if(found!=1)
         {
            strcpy(v[index].str,s);
            v[index].freq=1;
            index++;
         }
      }
   }
   for(i=0; i<index; i++)
      if(v[i].freq==n)
         printf("%s\n",v[i].str);

   return 0;
}
```

考試版本

```
#include <stdio.h>
#include <string.h>
#include <ctype.h>
struct Sfreq
{
   char str[1024];
   int freq;
};
int main()
{
   char s[61], text[1024]="";
   int n, i, j, k, index=0, found=0;
   struct Sfreq v[1024];

   scanf("%d",&n);
   while(scanf("%s",s) && strcmp(s,"EndOfText")!=0)
   {
      for(i=0; i<strlen(s); i++)
      {
         if(!isalpha(s[i]))
            s[i]=' ';
         if(!islower(s[i]))
            s[i]=tolower(s[i]);
      }
      if(strcmp(s," ")!=0)
      {
         strcat(text,s);
         strcat(text," ");
      }
   }
   j=0;
   for(i=0; i<strlen(text); i++)
   {
      if(text[i]!=' ')
         s[j++]=text[i];
      else
      {
         found=0;
         s[j]='\0';
```

```
            j=0;
            for(k=0; k<index; k++)
               if(strcmp(v[k].str,s)==0)
               {
                  v[k].freq++;
                  found=1;
               }
            if(found!=1)
            {
               strcpy(v[index].str,s);
               v[index].freq=1;
               index++;
            }
         }
      }
      for(i=0; i<index; i++)
         if(v[i].freq==n)
            printf("%s\n",v[i].str);

      return 0;
}
```

```
73 #include <stdio.h>
   #include <stdlib.h>
   #include <string.h>
   void inverse(char *ptr);
   int main()
   {
      FILE *inp;
      char invoice[7][9]={"79721354","10175755","59029610",   \
         "13492740","22791838","12994137","505"};
      char myInvoice[9], myCopy[9], temp[9];
      int i, j, win, count=0;

      inp=fopen("73.txt","r");
      while(fscanf(inp,"%s",myInvoice)!=EOF)
      {
         win=0;
         strcpy(myCopy,myInvoice);
         for(i=0; i<=2; i++)
            if(strcmp(invoice[i],myCopy)==0)
            {
               win=9;
               break;
            }
         if(win==0)
         {
            for(i=3; i<=5; i++)
               if(strcmp(invoice[i],myCopy)==0)
               {
                  win=8;
                  break;
               }
         }
         if(win==0)
         {
            inverse(myCopy);
            for(i=3; i<=5; i++)
            {
               strcpy(temp,invoice[i]);
               inverse(temp);
               for(j=7; j>2; j--)
```

```
            if(strncmp(temp,myCopy,j)==0)
            {
               win=j;
               break;
            }
         if(win) break;
      }
   }
   if(win==0)
   {
      strcpy(temp,invoice[6]);
      inverse(temp);
      if(strncmp(temp,myCopy,3)==0)
         win=3;
   }
   if(win)
   {
      count++;
      printf("統一發票號碼: %s",myInvoice);
      switch(win)
      {
      case 9:
        printf("\t 中了特獎 200 萬元!\n");  break;
      case 8:
        printf("\t 中了頭獎 20 萬元!\n");  break;
      case 7:
          printf("\t 中了二獎 4 萬元!\n");  break;
      case 6:
          printf("\t 中了三獎 1 萬元!\n");  break;
      case 5:
          printf("\t 中了四獎 4 仟元!\n");  break;
      case 4:
          printf("\t 中了五獎 1 仟元!\n");  break;
      case 3:
          printf("\t 中了六獎 2 百元!\n");
      }
   }
}
if(count==0)
   printf("抱歉你/妳沒有中獎！請繼續努力!\n");
```

```
   return 0;
}
void inverse(char *ptr)
{
   char temp;
   int i, j, len;
   len=strlen(ptr);
   for(i=0,j=len-1; i<len/2; i++,j--)
   {
      temp=*(ptr+j);
      *(ptr+j)=*(ptr+i);
      *(ptr+i)=temp;
   }
}
```

考試版本

```
#include <stdio.h>
#include <string.h>
void inverse(char *ptr);
int main()
{
   FILE *inp;
   char invoice[7][9]={"79721354","10175755","59029610",   \
      "13492740","22791838","12994137","505"};
   char myInvoice[9], myCopy[9], temp[9];
   int i, j, win, count=0;

   inp=fopen("73.txt","r");
   while(fscanf(inp,"%s",myInvoice)!=EOF)
   {
      win=0;
      strcpy(myCopy,myInvoice);
      for(i=0; i<=2; i++)
         if(strcmp(invoice[i],myCopy)==0)
         {
            win=9;
            break;
         }
      if(win==0)
      {
         for(i=3; i<=5; i++)
            if(strcmp(invoice[i],myCopy)==0)
            {
               win=8;
               break;
            }
      }
      if(win==0)
      {
         inverse(myCopy);
         for(i=3; i<=5; i++)
         {
            strcpy(temp,invoice[i]);
            inverse(temp);
            for(j=7; j>2; j--)
```

```
            if(strncmp(temp,myCopy,j)==0)
            {
               win=j;
               break;
            }
         if(win) break;
      }
   }
   if(win==0)
   {
      strcpy(temp,invoice[6]);
      inverse(temp);
      if(strncmp(temp,myCopy,3)==0)
         win=3;
   }
   if(win)
   {
      count++;
      printf("%s\n",myInvoice);
      switch(win)
      {
      case 9:
         printf("2000000\n");  break;
      case 8:
         printf("200000\n");  break;
      case 7:
          printf("40000\n");  break;
      case 6:
          printf("10000\n");  break;
      case 5:
          printf("4000\n");  break;
      case 4:
          printf("1000\n");  break;
      case 3:
          printf("200\n");
      }
   }
}
if(count==0)
   printf("0\n");
```

```
   return 0;
}
void inverse(char *ptr)
{
   char temp;
   int i, j, len;
   len=strlen(ptr);
   for(i=0,j=len-1; i<len/2; i++,j--)
   {
      temp=*(ptr+j);
      *(ptr+j)=*(ptr+i);
      *(ptr+i)=temp;
   }
}
```

```
74 #include <stdio.h>
   #include <stdlib.h>
   char digit[25];
   int n;
   void dfs(int k);
   int main()
   {
      int i, j, bits;

      printf("請輸入位元數：");
      scanf("%d",&n);
      printf("%d 位元 Gray 碼：\n",n);
      for(i=0; i<n; i++)
         digit[i]='0';
      digit[n]='\0';
      dfs(0);
      printf("\n");

      return 0;
   }
   void dfs(int k)
   {
      if(k==n)
      {
         printf("%s\t",digit);
         return;
      }
      dfs(k+1);
      digit[k]='0'+'1'-digit[k];
      dfs(k+1);
   }
```

考試版本

```
#include <stdio.h>
char digit[25];
int n;
void dfs(int k);
int main()
{
   int i, j, bits;

   scanf("%d",&n);
   for(i=0; i<n; i++)
      digit[i]='0';
   digit[n]='\0';
   dfs(0);
   printf("\n");

   return 0;
}
void dfs(int k)
{
   if(k==n)
   {
      printf("%s\t",digit);
      return;
   }
   dfs(k+1);
   digit[k]='0'+'1'-digit[k];
   dfs(k+1);
}
```

```
75 #include <stdio.h>
   #include <stdlib.h>
   #include <math.h>
   struct student
   {
      int id;
      int score;
   };
   int main()
   {
      char correct[51], ans[51];
      int i=0, j, n, c, wrong[50]={0};
      struct student stu[60];
      FILE *inp, *outp;

      inp=fopen("75.txt","r");
      outp=fopen("75_out.txt","w");
      fscanf(inp,"%d%s",&n,correct);
      while(fscanf(inp,"%d%s",&stu[i].id,ans)!=EOF)
      {
         c=0;
         for(j=0; j<n; j++)
            if(correct[j]==ans[j])
               c++;
            else
               wrong[j]++;
         stu[i++].score=ceil(100.0/n*c);
      }
      fprintf(outp,"\t\t 考試成績報告\n");
      fprintf(outp,"題號");
      for(j=1; j<=n; j++)
         fprintf(outp,"%4d",j);
      fprintf(outp,"\n 答案");
      for(j=0; j<n; j++)
         fprintf(outp,"%4c",correct[j]);
      fprintf(outp,"\n ID\t 分數\n");
      for(j=0; j<i; j++)
         fprintf(outp,"%d\t%d\n",stu[j].id,stu[j].score);
      fprintf(outp,"    題號");
      for(j=1; j<=n; j++)
```

```
      fprintf(outp,"%4d",j);
   fprintf(outp,"\n 錯誤分佈");
   for(j=0; j<n; j++)
      fprintf(outp,"%4d",wrong[j]);
   fclose(inp);
   fclose(outp);
   return 0;
}
```

考試版本

```
#include <stdio.h>
#include <math.h>
struct student
{
   int id;
   int score;
};
int main()
{
   char correct[51], ans[51];
   int i=0, j, n, c, wrong[50]={0};
   struct student stu[60];
   FILE *inp, *outp;

   inp=fopen("75.txt","r");
   outp=fopen("75_out.txt","w");
   fscanf(inp,"%d%s",&n,correct);
   while(fscanf(inp,"%d%s",&stu[i].id,ans)!=EOF)
   {
      c=0;
      for(j=0; j<n; j++)
         if(correct[j]==ans[j])
            c++;
         else
            wrong[j]++;
      stu[i++].score=ceil(100.0/n*c);
   }
   for(j=1; j<=n; j++)
      fprintf(outp,"%4d",j);
   fprintf(outp,"\n");
   for(j=0; j<n; j++)
      fprintf(outp,"%4c",correct[j]);
   fprintf(outp,"\n");
   for(j=0; j<i; j++)
      fprintf(outp,"%d\t%d\n",stu[j].id,stu[j].score);
   for(j=1; j<=n; j++)
      fprintf(outp,"%4d",j);
   fprintf(outp,"\n");
   for(j=0; j<n; j++)
```

```
      fprintf(outp,"%4d",wrong[j]);
   fclose(inp);
   fclose(outp);
   return 0;
}
```

```
76 #include <stdio.h>
   #include <stdlib.h>
   #include <string.h>
   #define MAXSTACK 10
   double stack[MAXSTACK];
   int top = -1;
   void push(double d);
   double pop();
   int main()
   {
      char s[21];
      double num, a, b;

      printf(">");
      scanf("%s",s);
      while(strcmp(s,"quit")!=0)
      {
         if(strcmp(s,"push")==0)
         {
            scanf("%lf",&num);
            push(num);
         }
         else if(strcmp(s,"pop")==0)
         {
            num=pop();
            if(num!=-1)
               printf("%.2f\n",num);
         }
         else if(strcmp(s,"+")==0)
         {
           if(top==0 || top==-1)
              printf("運算元不足，不足以計算\n");
           else
           {
              a=pop();
              b=pop();
              push(a+b);
           }
         }
         else if(strcmp(s,"-")==0)
```

```
      {
        if(top==0 || top==-1)
           printf("運算元不足，不足以計算\n");
        else
        {
           a=pop();
           b=pop();
           push(b-a);
        }
      }
      else if(strcmp(s,"*")==0)
      {
        if(top==0 || top==-1)
           printf("運算元不足，不足以計算\n");
        else
        {
           a=pop();
           b=pop();
           push(a*b);
        }
      }
      else if(strcmp(s,"/")==0)
      {
        if(top==0 || top==-1)
           printf("運算元不足，不足以計算\n");
        else
        {
           a=pop();
           b=pop();
           push(b/a);
        }
      }
      printf(">");
      scanf("%s",s);
   }

   return 0;
}
void push(double d)
{
   if(top==MAXSTACK-1)
```

```
      printf("Full\n");
   else
      stack[++top]=d;
}
double pop()
{
   if(top==-1)
   {
      printf("Empty\n");
      return -1;;
   }
   else
      return stack[top--];
}
```

考試版本

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#define MAXSTACK 10
double stack[MAXSTACK];
int top = -1;
void push(double d);
double pop();
int main()
{
   char cmd[100][100];
   char s[21];
   double num, a, b;
   int i=0;
   while(scanf("%s",s))
   {
      strcpy(cmd[i++],s);
      if(strcmp(s,"quit")==0)
         break;
   }
   i=0;
   while(strcmp(cmd[i],"quit")!=0)
   {
      strcpy(s,cmd[i]);
      if(strcmp(s,"push")==0)
      {
         i++;
         num=atoi(cmd[i]);
         push(num);
      }
      else if(strcmp(s,"pop")==0)
      {
         num=pop();
         if(num!=-1)
            printf("%.2f\n",num);
      }
      else if(strcmp(s,"+")==0)
      {
        if(top==0 || top==-1)
```

```
      printf("Error\n");
    else
    {
      a=pop();
      b=pop();
      push(a+b);
    }
  }
  else if(strcmp(s,"-")==0)
  {
    if(top==0 || top==-1)
      printf("Error\n");
    else
    {
      a=pop();
      b=pop();
      push(b-a);
    }
  }
  else if(strcmp(s,"*")==0)
  {
    if(top==0 || top==-1)
      printf("Error\n");
    else
    {
      a=pop();
      b=pop();
      push(a*b);
    }
  }
  else if(strcmp(s,"/")==0)
  {
    if(top==0 || top==-1)
      printf("Error\n");
    else
    {
      a=pop();
      b=pop();
      push(b/a);
    }
  }
```

```
      i++;
   }
   return 0;
}
void push(double d)
{
   if(top==MAXSTACK-1)
      printf("Full\n");
   else
      stack[++top]=d;
}
double pop()
{
   if(top==-1)
   {
      printf("Empty\n");
      return -1;;
   }
   else
      return stack[top--];
}
```

```
77 #include <stdio.h>
   int stack[1000000][3], mark[100][100][100], m, n, d;
   char map[100][100], s[100];
   const int dir[4][2]={0,1,1,0,0,-1,-1,0};
   int work();
   int main()
   {
      int i, j, ans;

      printf("請輸入矩陣大小ｍ及ｎ：");
      scanf("%d%d",&m,&n);
      printf("請輸入飛行距離：");
      scanf("%d",&d);
      printf("請輸入地形：\n");
      for(i=1; i<=m; i++)
      {
         scanf("%s",s);
         for(j=1; j<=n; j++)
            map[i][j]=s[j-1];
      }
      ans=work();
      if(ans>0)
         printf("最快到達基地所需的時間:%d\n",ans-1);
      else
         printf("impossible\n");
      return 0;
   }

   int work()
   {
      int i, j, k, total, px, py, pd, tx, ty, td;
      stack[1][0]=1;
      stack[1][1]=1;
      stack[1][2]=d;
      mark[1][1][d]=1;
      i=total=1;
      while(i<=total){
         px=stack[i][0];
         py=stack[i][1];
         pd=stack[i][2];
```

```
      for(j=0; j<4; j++){
         tx=px+dir[j][0];
         ty=py+dir[j][1];
         if(tx>0 && tx<=m && ty>0 && ty<=n &&   \
              map[tx][ty]=='P' && !mark[tx][ty][pd])
         {
            stack[++total][0]=tx;
            stack[total][1]=ty;
            stack[total][2]=pd;
            mark[tx][ty][pd]=mark[px][py][pd]+1;
            if(tx==m && ty==n)
               return mark[tx][ty][pd];
         }
         tx=px;
         ty=py;
         td=pd;
         for(k=1; k<=pd; k++){
            tx+=dir[j][0];
            ty+=dir[j][1];
            td--;
            if(tx<=0 || tx>m || ty<=0 || ty>n)
               break;
            if(map[tx][ty]=='P' && !mark[tx][ty][td]){
               stack[++total][0]=tx;
               stack[total][1]=ty;
               stack[total][2]=td;
               mark[tx][ty][td]=mark[px][py][pd]+1;
               if(tx==m && ty==n)
                  return mark[tx][ty][td];
            }
         }
      }
      i++;
   }
}
```

考試版本

```
#include <stdio.h>
int stack[1000000][3], mark[100][100][100], m, n, d;
char map[100][100], s[100];
const int dir[4][2]={0,1,1,0,0,-1,-1,0};
int work();
int main()
{
   int i, j, ans;

   scanf("%d%d",&m,&n);
   scanf("%d",&d);
   for(i=1; i<=m; i++)
   {
      scanf("%s",s);
      for(j=1; j<=n; j++)
         map[i][j]=s[j-1];
   }
   ans=work();
   if(ans>0)
      printf("%d\n",ans-1);
   else
      printf("impossible\n");
   return 0;
}

int work()
{
   int i, j, k, total, px, py, pd, tx, ty, td;
   stack[1][0]=1;
   stack[1][1]=1;
   stack[1][2]=d;
   mark[1][1][d]=1;
   i=total=1;
   while(i<=total){
      px=stack[i][0];
      py=stack[i][1];
      pd=stack[i][2];
      for(j=0; j<4; j++){
         tx=px+dir[j][0];
```

```
            ty=py+dir[j][1];
            if(tx>0 && tx<=m && ty>0 && ty<=n &&   \
                 map[tx][ty]=='P' && !mark[tx][ty][pd])
            {
               stack[++total][0]=tx;
               stack[total][1]=ty;
               stack[total][2]=pd;
               mark[tx][ty][pd]=mark[px][py][pd]+1;
               if(tx==m && ty==n)
                  return mark[tx][ty][pd];
            }
            tx=px;
            ty=py;
            td=pd;
            for(k=1; k<=pd; k++){
               tx+=dir[j][0];
               ty+=dir[j][1];
               td--;
               if(tx<=0 || tx>m || ty<=0 || ty>n)
                  break;
               if(map[tx][ty]=='P' && !mark[tx][ty][td]){
                  stack[++total][0]=tx;
                  stack[total][1]=ty;
                  stack[total][2]=td;
                  mark[tx][ty][td]=mark[px][py][pd]+1;
                  if(tx==m && ty==n)
                     return mark[tx][ty][td];
               }
            }
         }
         i++;
      }
   }
```

```
78 #include <stdio.h>
   struct point
   {
      long x;
      long y;
   };
   void bubble_sort(double a[], int size);
   int main()
   {
      int i, j, n, max, c, k, best;
      struct point a[1500];
      double slope[1500];

      printf("請輸入機器人數目：");
      scanf("%d",&n);
      printf("請輸入機器人在地圖上的座標：\n",n);
      for(i=0; i<n; i++)
         scanf("%ld%ld",&a[i].x,&a[i].y);
      best=0;
      for(i=0; i<n; i++)
      {
         k=0;
         max=0;
         for(j=0; j<n; j++)
            if(i!=j)
            {
               if(a[j].x==a[i].x)
                  max++;
               else
                  slope[k++]=(double)(a[j].y-a[i].y)/(a[j].x-a[i].x);
            }
         bubble_sort(slope,k);
         c=1;
         for(j=0; j<k; j++)
         {
            if(slope[j]-slope[j-1]>1e-8)
               c=1;
            else
               c++;
            if(c>max)
```

```
            max=c;
        }
        max++;
        if(max>best)
            best=max;
    }
    printf("最多能擊中%d 個機器人\n",best);

    return 0;
}

void bubble_sort(double a[], int size)
{
    int i, j, tag;
    double temp;
    for(i=size-1; i>0 ; i-- )
    {
        tag=0;
        for(j=0; j<=i-1; j++)
        if(a[j]>a[j+1])
        {
            temp=a[j];
            a[j]=a[j+1];
            a[j+1]=temp;
            tag=1;
        }
        if(tag == 0)
            break;
   }
}
```

考試版本

```
#include <stdio.h>
struct point
{
   long x;
   long y;
};
void bubble_sort(double a[], int size);
int main()
{
   int i, j, n, max, c, k, best;
   struct point a[1500];
   double slope[1500];

   scanf("%d",&n);
   for(i=0; i<n; i++)
      scanf("%ld%ld",&a[i].x,&a[i].y);
   best=0;
   for(i=0; i<n; i++)
   {
      k=0;
      max=0;
      for(j=0; j<n; j++)
         if(i!=j)
         {
            if(a[j].x==a[i].x)
               max++;
            else
               slope[k++]=(double)(a[j].y-a[i].y)/(a[j].x-a[i].x);
         }
      bubble_sort(slope,k);
      c=1;
      for(j=0; j<k; j++)
      {
         if(slope[j]-slope[j-1]>1e-8)
            c=1;
         else
            c++;
         if(c>max)
            max=c;
```

```
      }
      max++;
      if(max>best)
         best=max;
   }
   printf("%d\n",best);

   return 0;
}

void bubble_sort(double a[], int size)
{
   int i, j, tag;
   double temp;
   for(i=size-1; i>0 ; i-- )
   {
      tag=0;
      for(j=0; j<=i-1; j++)
      if(a[j]>a[j+1])
      {
         temp=a[j];
         a[j]=a[j+1];
         a[j+1]=temp;
         tag=1;
      }
      if(tag == 0)
         break;
  }
}
```

```
79 #include <stdio.h>
   #include <stdlib.h>
   struct student
   {
      int id;
      char name[21];
      int s_num;
   };
   struct school
   {
      int code;
      char sname[21];
   };
   typedef struct student STU;
   typedef struct school SCHOOL;
   int main()
   {
      FILE *inp1, *inp2;
      STU stu[101];
      SCHOOL sch[21];
      int i=1, j, n, s, a, b, c, accept[21][101]={0}, no[21], score;

      inp1=fopen("79_2.txt","r");

   while(fscanf(inp1,"%d%s%d",&sch[i].code,sch[i].sname,&no[i])!=E
   OF)
         i++;
      s=i-1;
      i=1;
      inp2=fopen("79_1.txt","r");

   while(fscanf(inp2,"%d%s%d%d%d%d",&stu[i].id,stu[i].name,&score,
   &a,&b,&c)!=EOF)
      {
         stu[i].s_num=0;
         if(a>0 && no[a]>accept[a][0])
         {
            accept[a][0]++;
            accept[a][accept[a][0]]=i;
            stu[i].s_num=a;
```

```
      }
      else if(b>0 && no[b]>accept[b][0])
      {
         accept[b][0]++;
         accept[b][accept[b][0]]=i;
         stu[i].s_num=b;
      }
      else if(c>0 && no[c]>accept[c][0])
      {
         accept[c][0]++;
         accept[c][accept[c][0]]=i;
         stu[i].s_num=c;
      }
      i++;
   }
   n=i-1;
   printf("學校對學生榜單：\n");
   for(i=1; i<=s; i++)
   {
      printf("%s | ",sch[i].sname);
      for(j=1; j<=accept[i][0]; j++)
         printf("%d                                                %s
",stu[accept[i][j]].id,stu[accept[i][j]].name);
      printf("\n");
   }
   printf("學生對學校榜單：\n");
   for(i=1; i<=n; i++)
   {
      if(stu[i].s_num!=0)

printf("%d\t%s\t%s\n",stu[i].id,stu[i].name,sch[stu[i].s_num].s
name);
      else
         printf("%d\t%s\t%s\n",stu[i].id,stu[i].name,"沒上榜");
   }
   fclose(inp1);
   fclose(inp2);
   return 0;
}
```

考試版本

```
#include <stdio.h>
#include <stdlib.h>
struct student
{
   int id;
   char name[21];
   int s_num;
};
struct school
{
   int code;
   char sname[21];
};
typedef struct student STU;
typedef struct school SCHOOL;
int main()
{
   FILE *inp1, *inp2;
   STU stu[101];
   SCHOOL sch[21];
   int i=1, j, n, s, a, b, c, accept[21][101]={0}, no[21], score;

   inp1=fopen("79_2.txt","r");

while(fscanf(inp1,"%d%s%d",&sch[i].code,sch[i].sname,&no[i])!=E
OF)
      i++;
   s=i-1;
   i=1;
   inp2=fopen("79_1.txt","r");

while(fscanf(inp2,"%d%s%d%d%d%d",&stu[i].id,stu[i].name,&score,
&a,&b,&c)!=EOF)
   {
      stu[i].s_num=0;
      if(a>0 && no[a]>accept[a][0])
      {
         accept[a][0]++;
         accept[a][accept[a][0]]=i;
```

```
            stu[i].s_num=a;
        }
        else if(b>0 && no[b]>accept[b][0])
        {
            accept[b][0]++;
            accept[b][accept[b][0]]=i;
            stu[i].s_num=b;
        }
        else if(c>0 && no[c]>accept[c][0])
        {
            accept[c][0]++;
            accept[c][accept[c][0]]=i;
            stu[i].s_num=c;
        }
        i++;
    }
    n=i-1;
    for(i=1; i<=s; i++)
    {
        printf("%s | ",sch[i].sname);
        for(j=1; j<=accept[i][0]; j++)
            printf("%d                                                %s
",stu[accept[i][j]].id,stu[accept[i][j]].name);
        printf("\n");
    }
   for(i=1; i<=n; i++)
    {
        if(stu[i].s_num!=0)

printf("%d\t%s\t%s\n",stu[i].id,stu[i].name,sch[stu[i].s_num].s
name);
        else
            printf("%d\t%s\t%s\n",stu[i].id,stu[i].name,"0");
    }
    fclose(inp1);
    fclose(inp2);
    return 0;
}
```

```
80 #include <stdio.h>
   #include <stdlib.h>
   int main()
   {
      int man[100][100], lady[100][100], flag[100][100];
      int p[100], q[100], n;
      int i, j, k, b, s, t;

      printf("請輸入配對數：");
      scanf("%d",&n);
      printf("男士對女士的排序:\n");
      for(i=1; i<=n; i++)
         for(j=1; j<=n; j++)
            scanf("%d",&man[i][j]);
      printf("女士對男士的排序:\n");
      for(i=1; i<=n; i++)
         for(j=1; j<=n; j++)
         {
            scanf("%d",&k);
            lady[i][j]=k;
            flag[i][k]=j;
         }
      for(i=1; i<=n; i++)
         p[i]=1;
      b=0;
      while(!b)
      {
         b=1;
         for(i=1; i<=n; i++)
            q[i]=0;
         for(i=1; i<=n; i++)
         {
            j=man[i][p[i]];
            if(q[j]==0)
               q[j]=i;
            else
            {
               b=0;
               s=flag[j][i];
               t=flag[j][q[j]];
```

```
            if(s>t)
               p[i]++;
            else
            {
               p[q[j]]++;
               q[j]=i;
            }
         }
      }
   }
   for(i=1; i<=n; i++)
      printf("第%d位男士匹配的女士編號為%d\n",i,man[i][p[i]]);
      return 0;
}
```

考試版本

```
#include <stdio.h>
int main()
{
   int man[100][100], lady[100][100], flag[100][100];
   int p[100], q[100], n;
   int i, j, k, b, s, t;

   scanf("%d",&n);
   for(i=1; i<=n; i++)
      for(j=1; j<=n; j++)
         scanf("%d",&man[i][j]);
   for(i=1; i<=n; i++)
      for(j=1; j<=n; j++)
      {
         scanf("%d",&k);
         lady[i][j]=k;
         flag[i][k]=j;
      }
   for(i=1; i<=n; i++)
      p[i]=1;
   b=0;
   while(!b)
   {
      b=1;
      for(i=1; i<=n; i++)
         q[i]=0;
      for(i=1; i<=n; i++)
      {
         j=man[i][p[i]];
         if(q[j]==0)
            q[j]=i;
         else
         {
            b=0;
            s=flag[j][i];
            t=flag[j][q[j]];
            if(s>t)
               p[i]++;
            else
```

```
            {
               p[q[j]]++;
               q[j]=i;
            }
         }
      }
   }
   for(i=1; i<=n; i++)
      printf("%d %d\n",i,man[i][p[i]]);
   return 0;
}
```

```
81 #include <stdio.h>
   #include <stdlib.h>
   #define INFINITE 999999999
   int flow[8][8],cost[8][8];
   int from[8],dis[8];
   int bellman();
   int main()
   {
      int i, j, k, min, total=0;

      printf("A、B、C 三個採砂場每天採砂量：");
      for(i=1; i<=3; i++)
         scanf("%d",&flow[0][i]);
      printf("甲、乙、丙三個工地每天需要砂子量：");
      for(i=4; i<=6; i++)
         scanf("%d",&flow[i][7]);
      printf("A、B、C 三個採砂場每噸採砂費：");
      for(i=1; i<=3; i++)
      {
         scanf("%d",&cost[0][i]);
         cost[i][0]=-cost[0][i];
      }
      printf("從三個砂場地運往甲、乙、丙三工地的每噸運費：");
      for(i=1; i<=3; i++)
         for(j=4; j<=6; j++)
         {
            flow[i][j]=INFINITE;
            scanf("%d",&cost[i][j]);
            cost[j][i]=-cost[i][j];
         }
       while(bellman())
       {
          min=INFINITE;
          for(i=7; i>0; i=from[i])
             if(min>flow[from[i]][i])
                min=flow[from[i]][i];
          total+=dis[7]*min;
          for(i=7;i>0;i=from[i])
          {
             flow[from[i]][i]-=min;
```

```
            flow[i][from[i]]+=min;
         }
      }
      printf("每天從A、B、C三個採砂場運到甲工地的砂石噸量:");
      printf("%d %d %d\n",flow[4][1],flow[4][2],flow[4][3]);
      printf("每天從A、B、C三個採砂場運到乙工地的砂石噸量:");
      printf("%d %d %d\n",flow[5][1],flow[5][2],flow[5][3]);
      printf("每天從A、B、C三個採砂場運到丙工地的砂石噸量:");
      printf("%d %d %d\n",flow[6][1],flow[6][2],flow[6][3]);
      printf("所需費用：%d\n",total);

      return 0;
}
int bellman()
{
   int i, j, k;
   for(i=1; i<8; i++)
      dis[i]=INFINITE;
   for(i=0; i<7; i++)
      for(j=0; j<8; j++)
         for(k=0; k<8; k++)
            if(flow[j][k]>0 && dis[k]>dis[j]+cost[j][k])
            {
               dis[k]=dis[j]+cost[j][k];
               from[k]=j;
            }
    return (dis[7]==INFINITE? 0 : 1);
}
```

考試版本

```
#include <stdio.h>
#define INFINITE 999999999
int flow[8][8],cost[8][8];
int from[8],dis[8];
int bellman();
int main()
{
   int i, j, k, min, total=0;

   for(i=1; i<=3; i++)
      scanf("%d",&flow[0][i]);
   for(i=4; i<=6; i++)
      scanf("%d",&flow[i][7]);
   for(i=1; i<=3; i++)
   {
      scanf("%d",&cost[0][i]);
      cost[i][0]=-cost[0][i];
   }
   for(i=1; i<=3; i++)
      for(j=4; j<=6; j++)
      {
         flow[i][j]=INFINITE;
         scanf("%d",&cost[i][j]);
         cost[j][i]=-cost[i][j];
      }
    while(bellman())
    {
       min=INFINITE;
       for(i=7; i>0; i=from[i])
          if(min>flow[from[i]][i])
             min=flow[from[i]][i];
       total+=dis[7]*min;
       for(i=7;i>0;i=from[i])
       {
          flow[from[i]][i]-=min;
          flow[i][from[i]]+=min;
       }
    }
    printf("%d %d %d\n",flow[4][1],flow[4][2],flow[4][3]);
```

```
    printf("%d %d %d\n",flow[5][1],flow[5][2],flow[5][3]);
    printf("%d %d %d\n",flow[6][1],flow[6][2],flow[6][3]);
    printf("%d\n",total);

    return 0;
}
int bellman()
{
   int i, j, k;
   for(i=1; i<8; i++)
      dis[i]=INFINITE;
   for(i=0; i<7; i++)
      for(j=0; j<8; j++)
         for(k=0; k<8; k++)
            if(flow[j][k]>0 && dis[k]>dis[j]+cost[j][k])
            {
               dis[k]=dis[j]+cost[j][k];
               from[k]=j;
            }
    return (dis[7]==INFINITE? 0 : 1);
}
```

```
82 #include <stdio.h>
   #include <stdlib.h>
   #include <math.h>
   long findk(long m);
   void solve(long, long, long, long, long *, long *);
   int main()
   {
      long n, m, k, L, x, y;

      printf("請輸入奇數 n：");
      scanf("%d",&n);
      printf("請輸入要找出位置的數：");
      scanf("%d",&m);
      k=findk(m);
      L=2*k+1;
      solve((n>>1)+1-k,(n>>1)+1+k,L,L*L-m,&x,&y);
      printf("%d 在第%d 列第%d 行\n",m,x,y);
      return 0;
   }
   long findk(long m)
   {
      long p;
      p=(int)sqrt(m);
      if(p*p==m && p&1)
         return (p-1)/2;
      else
         return (p-1)/2+1;
   }
   void solve(long row, long col, long L, long delta, long *rp, long
   *cp)
   {
      *rp=row;
      *cp=col;
      if(delta<L)
      {
         *cp-=delta;
         return;
      }
      delta-=(L-1);
      *cp-=(L-1);
```

```
    if(delta<L)
    {
       *rp+=delta;
       return;
    }
    delta-=(L-1);
    *rp+=(L-1);
    if(delta<L)
    {
       *cp+=delta;
       return;
    }
    delta-=(L-1);
    *cp+=(L-1);
    *rp-=delta;
}
```

考試版本

```
#include <stdio.h>
#include <math.h>
long findk(long m);
void solve(long, long, long, long, long *, long *);
int main()
{
   long n, m, k, L, x, y;

   scanf("%d",&n);
   scanf("%d",&m);
   k=findk(m);
   L=2*k+1;
   solve((n>>1)+1-k,(n>>1)+1+k,L,L*L-m,&x,&y);
   printf("%d %d %d \n",m,x,y);
   return 0;
}
long findk(long m)
{
   long p;
   p=(int)sqrt(m);
   if(p*p==m && p&1)
      return (p-1)/2;
   else
      return (p-1)/2+1;
}
void solve(long row, long col, long L, long delta, long *rp, long
*cp)
{
   *rp=row;
   *cp=col;
   if(delta<L)
   {
      *cp-=delta;
      return;
   }
   delta-=(L-1);
   *cp-=(L-1);
   if(delta<L)
   {
```

```
      *rp+=delta;
      return;
    }
    delta-=(L-1);
    *rp+=(L-1);
    if(delta<L)
    {
      *cp+=delta;
      return;
    }
    delta-=(L-1);
    *cp+=(L-1);
    *rp-=delta;
}
```

```
83 #include <stdio.h>
   #define N 10
   #define INF 1e9
   int shortpath(int,int,int);
   int g[N][N];
   int main()
   {
       int n,v1,v2,w,mincost;
       int i,j;
       for(i=0;i<N;i++)
           for(j=0;j<N;j++)
               g[i][j]=INF;
       printf("請輸入頂點個數\n");
       scanf("%d",&n);
       printf("請輸入邊與權重\n");
       while(1){
           scanf("%d",&v1);
           if(v1==-1) break;
           scanf("%d%d",&v2,&w);
           g[v1][v2]=g[v2][v1]=w;
       }
       printf("請輸入開始頂點與結束頂點\n");
       scanf("%d%d",&v1,&v2);
       mincost=shortpath(v1,v2,n);
       if(mincost ==-1 || mincost==INF)
           printf("無最短路徑");
       else
           printf("最短路徑成本=%d",mincost);
       return 0;
   }

   int shortpath(int vs, int vf, int n)
   {
       int cost[N],selected[N]={0};
       int i,v,min;

       v=vs;
       selected[v]=1;
       for(i=0;i<n;i++) cost[i]=g[v][i];
       while(v!=vf){
```

```
        for(i=0; i<n && selected[i];i++);
        if(i<n)
           min=i;
        else
           return -1;
        for(i=min+1;i<n;i++)
            if(!selected[i] && cost[i]<cost[min])
               min=i;
        v=min;
        selected[v]=1;
        for(i=0;i<n;i++)
            if(v!=i && !selected[i])
               if(cost[i]>cost[v]+g[v][i])
                  cost[i]=cost[v]+g[v][i];
    }
    return cost[vf];
}
```

考試版本

```
#include <stdio.h>
#define N 10
#define INF 1e9
int shortpath(int,int,int);
int g[N][N];
int main()
{
    int n,v1,v2,w,mincost;
    int i,j;
    for(i=0;i<N;i++)
        for(j=0;j<N;j++)
            g[i][j]=INF;
    scanf("%d",&n);
    while(1){
        scanf("%d",&v1);
        if(v1==-1) break;
        scanf("%d%d",&v2,&w);
        g[v1][v2]=g[v2][v1]=w;
    }
    scanf("%d%d",&v1,&v2);
    mincost=shortpath(v1,v2,n);
    if(mincost ==-1 || mincost==INF)
        printf("0");
    else
        printf("%d",mincost);
    return 0;
}

int shortpath(int vs, int vf, int n)
{
    int cost[N],selected[N]={0};
    int i,v,min;

    v=vs;
    selected[v]=1;
    for(i=0;i<n;i++) cost[i]=g[v][i];
    while(v!=vf){
        for(i=0; i<n && selected[i];i++);
        if(i<n)
```

```
            min=i;
        else
            return -1;
        for(i=min+1;i<n;i++)
            if(!selected[i] && cost[i]<cost[min])
                min=i;
        v=min;
        selected[v]=1;
        for(i=0;i<n;i++)
            if(v!=i && !selected[i])
                if(cost[i]>cost[v]+g[v][i])
                    cost[i]=cost[v]+g[v][i];
    }
    return cost[vf];
}
```

```
84 #include <stdio.h>
   #include <stdlib.h>
   #include <string.h>
   int main()
   {
      struct complex{
         double rp;
         double ip;
      };
      struct complex a, b, c;
      char choose[5];

      scanf("%s",&choose);
      scanf("%lf%lf%lf%lf",&a.rp,&a.ip,&b.rp,&b.ip);
      if(strcmp(choose,"add")==0)
      {
         c.rp=a.rp+b.rp;
         c.ip=a.ip+b.ip;
         printf("(%.2f%+.2fi)+(%.2f%+.2fi)                              =
   %.2f%+.2fi\n",a.rp,a.ip,b.rp,b.ip,c.rp,c.ip);
      }
      else if(strcmp(choose,"sub")==0)
      {
         c.rp=a.rp-b.rp;
         c.ip=a.ip-b.ip;
         printf("(%.2f%+.2fi)-(%.2f%+.2fi)                              =
   %.2f%+.2fi\n",a.rp,a.ip,b.rp,b.ip,c.rp,c.ip);
      }
       else if(strcmp(choose,"mul")==0)
      {
         c.rp=a.rp*b.rp-a.ip*b.ip;
         c.ip=a.rp*b.ip+a.ip*b.rp;
         printf("(%.2f%+.2fi)x(%.2f%+.2fi)                              =
   %.2f%+.2fi\n",a.rp,a.ip,b.rp,b.ip,c.rp,c.ip);
      }
      else if(strcmp(choose,"div")==0)
      {
         c.rp=(a.rp*b.rp+a.ip*b.ip)/(b.rp*b.rp+b.ip*b.ip);
         c.ip=(a.ip*b.rp-a.rp*b.ip)/(b.rp*b.rp+b.ip*b.ip);
         printf("(%.2f%+.2fi)/(%.2f%+.2fi)                              =
   %.2f%+.2fi\n",a.rp,a.ip,b.rp,b.ip,c.rp,c.ip);
      }
       return 0;
   }
```

考試版本

```
#include <stdio.h>
#include <string.h>
int main()
{
   struct complex{
      double rp;
      double ip;
   };
   struct complex a, b, c;
   char choose[5];

   scanf("%s",&choose);
   scanf("%lf%lf%lf%lf",&a.rp,&a.ip,&b.rp,&b.ip);
   if(strcmp(choose,"add")==0)
   {
      c.rp=a.rp+b.rp;
      c.ip=a.ip+b.ip;
      printf("(%.2f%+.2fi)+(%.2f%+.2fi) =
%.2f%+.2fi\n",a.rp,a.ip,b.rp,b.ip,c.rp,c.ip);
   }
   else if(strcmp(choose,"sub")==0)
   {
      c.rp=a.rp-b.rp;
      c.ip=a.ip-b.ip;
      printf("(%.2f%+.2fi)-(%.2f%+.2fi) =
%.2f%+.2fi\n",a.rp,a.ip,b.rp,b.ip,c.rp,c.ip);
   }
    else if(strcmp(choose,"mul")==0)
   {
      c.rp=a.rp*b.rp-a.ip*b.ip;
      c.ip=a.rp*b.ip+a.ip*b.rp;
      printf("(%.2f%+.2fi)x(%.2f%+.2fi) =
%.2f%+.2fi\n",a.rp,a.ip,b.rp,b.ip,c.rp,c.ip);
   }
   else if(strcmp(choose,"div")==0)
   {
      c.rp=(a.rp*b.rp+a.ip*b.ip)/(b.rp*b.rp+b.ip*b.ip);
      c.ip=(a.ip*b.rp-a.rp*b.ip)/(b.rp*b.rp+b.ip*b.ip);
      printf("(%.2f%+.2fi)/(%.2f%+.2fi) =
%.2f%+.2fi\n",a.rp,a.ip,b.rp,b.ip,c.rp,c.ip);
   }
    return 0;
}
```

```
85 #include <stdio.h>
   int main()
   {
       int i,Q,P,q,p;
       int len_noloop,len_loop,counter2=0,counter5=0;

       printf("輸入分子與分母：");
       scanf("%d%d",&Q,&P);
       Q=q=Q%P;
       if(Q==0) {
           printf("循環節為 0\n");
           return 0;
       }
       p=P;
       while(P%2==0){
           P/=2;
           counter2++;
       }
       while(P%5==0){
           P/=5;
           counter5++;
       }
       len_noloop = ((counter2 > counter5) ? (counter2) : (counter5));
       for(i=0; i!=len_noloop; i++) {
           q*=10;
           q%=p;
       }
       printf("循環節為");
       Q = q;
       len_loop = 0;
       do{
           q*=10;
           printf("%d",q/p);
           q%=p;
           len_loop++;
           if(len_loop>10){
               printf("...");
               break;
           }
       }while(q!=Q);
       return 0;
   }
```

考試版本

```
#include <stdio.h>
int main()
{
    int i,Q,P,q,p;
    int len_noloop,len_loop,counter2=0,counter5=0;

    scanf("%d%d",&Q,&P);
    Q=q=Q%P;
    if(Q==0) {
       return 0;
    }
    p=P;
    while(P%2==0){
        P/=2;
        counter2++;
    }
    while(P%5==0){
        P/=5;
        counter5++;
    }
    len_noloop = ((counter2 > counter5) ? (counter2) : (counter5));
    for(i=0; i!=len_noloop; i++) {
        q*=10;
        q%=p;
    }
    Q = q;
    len_loop = 0;
    do{
        q*=10;
        printf("%d",q/p);
        q%=p;
        len_loop++;
        if(len_loop>=10){
            printf("...");
            break;
        }
    }while(q!=Q);
    return 0;
}
```

86
```
#include <stdio.h>
#include <stdlib.h>
int a[100][100];
int c[100], m, n, total;
struct node
{
   int row;
   int col;
} p[10000];
void sort(struct node p[],int size);
int main()
{
   int b[100][100], r[100][100], nc[10000];
   int c[100]={0}, m, n, total, i, j, k=0, sum=0;

   printf("請輸入矩陣大小(m,n)：");
   scanf("%d%d",&m,&n);
   printf("請輸入矩陣元素：\n");
   for(i=0; i<m; i++)
      for(j=0; j<n; j++)
         scanf("%d",&a[i][j]);
   for(i=0; i<m; i++)
      for(j=0; j<n; j++)
      {
         p[k].row=i;
         p[k++].col=j;
      }
   sort(p,k);
   total=0;
   r[p[0].row][p[0].col]=total;
   for(i=1; i<k; i++)
   {
      if(a[p[i].row][p[i].col]!=a[p[i-1].row][p[i-1].col])
        total++;
      r[p[i].row][p[i].col]=total;
   }
   for(i=0; i<=total; i++)
      nc[i]=n;
   for(i=0; i<m; i++)
   {
```

```
      sum=0;
      for(j=0; j<n; j++)
      {
         if(j<nc[r[i][j]])
         {
            c[nc[r[i][j]]+1]--;
            nc[r[i][j]]=j;
            c[nc[r[i][j]]+1]++;
         }
         sum+=c[j+1];
         b[i][j]=sum;
      }
   }
   for(i=0; i<m; i++)
   {
      for(j=0; j<n; j++)
         printf("%5d",b[i][j]);
      printf("\n");
   }

   return 0;
}
void sort(struct node x[],int size)
{
   int i, j, tag;
   struct node temp;
   for(i=size-1; i>0 ; i-- )
   {
      tag=0;
      for(j=0; j<=i-1; j++)
      if(a[x[j].row][x[j].col]<a[x[j+1].row][x[j+1].col])
      {
         temp=x[j];
         x[j]=x[j+1];
         x[j+1]=temp;
         tag=1;
      }
      if(tag==0)
         break;
   }
}
```

考試版本

```
#include <stdio.h>
int a[100][100];
int c[100], m, n, total;
struct node
{
   int row;
   int col;
} p[10000];
void sort(struct node p[],int size);
int main()
{
   int b[100][100], r[100][100], nc[10000];
   int c[100]={0}, m, n, total, i, j, k=0, sum=0;

   scanf("%d%d",&m,&n);
   for(i=0; i<m; i++)
      for(j=0; j<n; j++)
         scanf("%d",&a[i][j]);
   for(i=0; i<m; i++)
      for(j=0; j<n; j++)
      {
         p[k].row=i;
         p[k++].col=j;
      }
   sort(p,k);
   total=0;
   r[p[0].row][p[0].col]=total;
   for(i=1; i<k; i++)
   {
      if(a[p[i].row][p[i].col]!=a[p[i-1].row][p[i-1].col])
        total++;
      r[p[i].row][p[i].col]=total;
   }
   for(i=0; i<=total; i++)
      nc[i]=n;
   for(i=0; i<m; i++)
   {
      sum=0;
      for(j=0; j<n; j++)
```

```
      {
         if(j<nc[r[i][j]])
         {
            c[nc[r[i][j]]+1]--;
            nc[r[i][j]]=j;
            c[nc[r[i][j]]+1]++;
         }
         sum+=c[j+1];
         b[i][j]=sum;
      }
   }
   for(i=0; i<m; i++)
   {
      for(j=0; j<n; j++)
         printf("%5d",b[i][j]);
      printf("\n");
   }

   return 0;
}
void sort(struct node x[],int size)
{
   int i, j, tag;
   struct node temp;
   for(i=size-1; i>0 ; i-- )
   {
      tag=0;
      for(j=0; j<=i-1; j++)
      if(a[x[j].row][x[j].col]<a[x[j+1].row][x[j+1].col])
      {
         temp=x[j];
         x[j]=x[j+1];
         x[j+1]=temp;
         tag=1;
      }
      if(tag==0)
         break;
   }
}
```

```
87 #include <stdio.h>
   #define INFINITE 10000
   #define t_elevator 4
   #define t_stop 10
   #define t_walk 20
   int main()
   {
      int i, j, k, p, n, walktime, t;
      int nfloor[35], a[35][35]={0};

      printf("請輸入有幾層樓要停：");
      scanf("%d",&n);
      printf("那幾層樓要停：");
      for(i=0; i<n; i++)
      scanf("%d",&nfloor[i]);
      for(j=0; j<n; j++)
         a[32][j]=INFINITE;
      for(i=31; i>=1; i--)
         for(j=n-1; j>=0; j--)
         {
            a[i][j]=a[i+1][j]+t_elevator;
            walktime=0;
            for(k=j; k<=n-1; k++)
            {
               if(walktime<abs(nfloor[k]-i)*t_walk)
                  walktime=abs(nfloor[k]-i)*t_walk;
               if(k<n-1)
               {
                  t=a[i][k+1];
                  if(i>1) t+=t_stop;
                  if(walktime>t)
                     p=walktime;
                  else
                     p=t;
               }
               else
                  p=walktime;
               if(p<a[i][j])
               {
                  a[i][j]=p;
               }
            }
         }
      printf("最後一個人到達所需時間:%d 秒\n",a[1][0]);
      return 0;
   }
```

考試版本

```
#include <stdio.h>
#define INFINITE 10000
#define t_elevator 4
#define t_stop 10
#define t_walk 20
int main()
{
   int i, j, k, p, n, walktime, t;
   int nfloor[35], a[35][35]={0};

   scanf("%d",&n);
   for(i=0; i<n; i++)
   scanf("%d",&nfloor[i]);
   for(j=0; j<n; j++)
      a[32][j]=INFINITE;
   for(i=31; i>=1; i--)
      for(j=n-1; j>=0; j--)
      {
         a[i][j]=a[i+1][j]+t_elevator;
         walktime=0;
         for(k=j; k<=n-1; k++)
         {
            if(walktime<abs(nfloor[k]-i)*t_walk)
               walktime=abs(nfloor[k]-i)*t_walk;
            if(k<n-1)
            {
               t=a[i][k+1];
               if(i>1) t+=t_stop;
               if(walktime>t)
                  p=walktime;
               else
                  p=t;
            }
            else
               p=walktime;
            if(p<a[i][j])
            {
               a[i][j]=p;
            }
         }
      }
   printf("%d\n",a[1][0]);
   return 0;
}
```

```
88 #include <stdio.h>
   int main()
   {
      int a[110][110], next[110], head, n;
      int i, j, k;

      printf("請輸入工作數：");
      scanf("%d",&n);
      printf("請輸入工作間的關聯：\n");
      for(i=0; i<n; i++)
      {
         for(j=0; j<n; j++)
            scanf("%d",&a[i][j]);
         next[i]=-1;
      }
      head=0;
      for(i=1; i<n; i++)
      {
         if(a[i][head])
         {
            next[i]=head;
            head=i;
            continue;
         }
         j=head;
         k=next[j];
         while(k!=-1)
         {
            if(a[j][i] && a[i][k])
               break;
            j=k;
            k=next[j];
         }
         next[i]=k;
         next[j]=i;
      }
      printf("工作序列為:");
      for(i=0; i<n; i++)
      {
         printf("%3d",head+1);
         head=next[head];
      }
      printf("\n");
      return 0;
   }
```

考試版本

```
#include <stdio.h>
int main()
{
   int a[110][110], next[110], head, n;
   int i, j, k;

   scanf("%d",&n);
   for(i=0; i<n; i++)
   {
      for(j=0; j<n; j++)
         scanf("%d",&a[i][j]);
      next[i]=-1;
   }
   head=0;
   for(i=1; i<n; i++)
   {
      if(a[i][head])
      {
         next[i]=head;
         head=i;
         continue;
      }
      j=head;
      k=next[j];
      while(k!=-1)
      {
         if(a[j][i] && a[i][k])
            break;
         j=k;
         k=next[j];
      }
      next[i]=k;
      next[j]=i;
   }
   for(i=0; i<n; i++)
   {
      printf("%3d",head+1);
      head=next[head];
   }
   printf("\n");
   return 0;
}
```

```
89 #include <stdio.h>
   #define MAX 80
   void postfix(char *, char *);
   int priority(char);
   int main()
   {
       char input[MAX];
       char output[MAX] = {'\0'};

       printf("輸入中序運算式：");
       scanf("%s", input);
       postfix(input, output);
       printf("%s\n", output);
       return 0;
   }

   void postfix(char *infix, char *post)
   {
       char stack[MAX] = {'\0'};
       int i = 0, j=0;
       int top = 0;
       while(infix[i] != '\0') {
           switch(infix[i]) {
               case '(':
                   if(top < MAX-1)
                       stack[++top] = infix[i];
                   break;
               case '+': case '-': case '*': case '/':
                   while(priority(stack[top]) >= priority(infix[i]))
                       post[j++] = stack[top--];
                   if(top < MAX-1)
                       stack[++top] = infix[i];
                   break;
               case ')':
                   while(stack[top] != '(')
                       post[j++] = stack[top--];
                   top--;
                   break;
               default:
                   post[j++] = infix[i];
```

```
        }
        i++;
    }
    while(top > 0)
        post[j++] = stack[top--];
    return;
}

int priority(char op) {
    int p;
    switch(op) {
        case '+': case '-':
            p = 1;  break;
        case '*': case '/':
            p = 2; break;
        default:
            p = 0; break;
    }
    return p;
}
```

考試版本

```
#include <stdio.h>
#define MAX 80
void postfix(char *, char *);
int priority(char);
int main()
{
    char input[MAX];
    char output[MAX] = {'\0'};

    scanf("%s", input);
    postfix(input, output);
    printf("%s\n", output);
    return 0;
}

void postfix(char *infix, char *post)
{
    char stack[MAX] = {'\0'};
    int i = 0, j=0;
    int top = 0;
    while(infix[i] != '\0') {
        switch(infix[i]) {
            case '(':
                if(top < MAX-1)
                    stack[++top] = infix[i];
                break;
            case '+': case '-': case '*': case '/':
                while(priority(stack[top]) >= priority(infix[i]))
                    post[j++] = stack[top--];
                if(top < MAX-1)
                    stack[++top] = infix[i];
                break;
            case ')':
                while(stack[top] != '(')
                    post[j++] = stack[top--];
                top--;
                break;
            default:
                post[j++] = infix[i];
```

```
        }
        i++;
    }
    while(top > 0)
        post[j++] = stack[top--];
    return;
}

int priority(char op) {
    int p;
    switch(op) {
        case '+': case '-':
            p = 1;  break;
        case '*': case '/':
            p = 2; break;
        default:
            p = 0; break;
    }
    return p;
}
```

90
```c
#include <stdio.h>
void del(int *,int,int,int);
int main()
{
    int n,k,m,i,j;
    printf("輸入n, k, m值：");
    scanf("%d %d %d",&n,&k,&m);
    int a[n];
    for(i=0;i<n;i++) a[i]=i+1;
    del(a,n,k,m);
    for(i=0;i<n;i++)
      if(a[i]!=0) printf("%d ",a[i]);
    return 0;
}

void del(int a[],int n,int k,int m)
{
    int i,counter,pos;
    for(counter=n, pos=-1; counter>m; counter--) {
        i=0;
        while(i<k) {
            pos=(pos+1)%n;
            if(a[pos]!=0)
                i++;
        }
        a[pos]=0;
    }
}
```

考試版本

```
#include <stdio.h>
void del(int *,int,int,int);
int main()
{
    int n,k,m,i,j;
    scanf("%d %d %d",&n,&k,&m);
    int a[n];
    for(i=0;i<n;i++) a[i]=i+1;
    del(a,n,k,m);
    for(i=0;i<n;i++)
       if(a[i]!=0) printf("%d ",a[i]);
    return 0;
}

void del(int a[],int n,int k,int m)
{
    int i,counter,pos;
    for(counter=n, pos=-1; counter>m; counter--) {
        i=0;
        while(i<k) {
            pos=(pos+1)%n;
            if(a[pos]!=0)
                i++;
        }
        a[pos]=0;
    }
}
```

==========