

《程序设计技术》(第三版) 习题参考答案及说明

习题 1

四、程序设计题

11xt 010401.cpp

```
#include <stdio.h>
#define PI 3.1415926
void main()
{   double r,h;
    printf("请输入半径 r 和高 h: ");
    scanf("%lf,%lf",&r,&h);
    printf("圆半径: %lf\n",2*PI*r);

    printf("圆面积: %lf\n",PI*r*r);

    printf("圆球表面积: %lf\n",4*PI*r*r);

    printf("圆球体积: %lf\n",4.0/3*PI*r*r);

    printf("圆柱体积: %lf\n",PI*r*r*h);
}
```

11xt 010402.cpp

```
#include <stdio.h>
void main()
{   int c;
    printf("Input a character:");
    c=getchar();
    printf("%c\t%d\n",c,c);
}
```

11xt 010403.cpp

```
#include <stdio.h>
void main()
{   int x,y,h=30,f=90;
    x=(4*h-f)/2;
    y=(f-2*h)/2;

    printf("鸡: %d, 兔: %d\n",x,y);
}
```

```
}
```

11xt 010404.cpp

```
#include <stdio.h>
```

```
#include <math.h>
```

```
void main()
```

```
{ double a,b,c,s,area;
```

```
printf("请输入三角形的三条边长 (注意三条边长应能够构成三角形): ");
```

```
scanf("%lf,%lf,%lf",&a,&b,&c);
```

```
s=(a+b+c)/2;
```

```
area=sqrt(s*(s-a)*(s-b)*(s-c));
```

```
printf("三角形的面积是: %lf\n",area);
```

```
}
```

11xt 010405.cpp

```
#include <stdio.h>
```

```
void main()
```

```
{ double f,c;
```

```
printf("请输入华氏温度: ");
```

```
scanf("%lf",&f);
```

```
c=5.0/9.0*(f-32);
```

```
printf("与华氏温度%.2lf 对应的摄氏温度是: %.2lf\n",f,c);
```

```
}
```

11xt 010406.cpp

```
#include <stdio.h>
```

```
void main()
```

```
{ char c1,c2,c3,c4,c5;
```

```
printf("请输入需加密的字符串 (5 个字符): ");
```

```
c1=getchar();
```

```
c2=getchar();
```

```
c3=getchar();
```

```
c4=getchar();
```

```
c5=getchar();
```

```
printf("加密后的字符串是: ");
```

```
putchar(c1+5);
```

```
putchar(c2+5);
```

```
putchar(c3+5);
```

```

    putchar(c4+5);
    putchar(c5+5);
    printf("\n");
}

```

习题 2

四、程序设计题

```

/* xt020401.cpp */
#include <stdio.h>
void main()
{
    int num;
    printf("**** Input num:   ****\n");
    scanf("%d",&num);
    if(num%3==0&&num%5==0&&num%7==0)
        printf("*** YES ! **\n");
    else
        printf("*** NO !   **\n");
}

/* xt020402.cpp */
#include <stdio.h>
void main()
{
    int h=15;
    float x1=2,y1=2,x2=-2,y2=2,x3=-2,y3=-2,x4=2,y4=-2,x,y,d1,d2,d3,d4;
    printf("**** input: x,y ****\n");
    scanf("%f,%f",&x,&y);

    d1=(x-x4)*(x-x4)+(y-y4)*(y-y4); /*点 (x,y) 到各中心点的距离*/
    d2=(x-x1)*(x-x1)+(y-y1)*(y-y1);
    d3=(x-x2)*(x-x2)+(y-y2)*(y-y2);
    d4=(x-x3)*(x-x3)+(y-y3)*(y-y3);

    if(d1>1&&d2>1&&d3>1&&d4>1)/*判断该点是否在塔外*/
        h=0;
    printf("x=%f, y=%f\n",x,y);
    printf("h=%d\n",h);
}

```

调试该程序时请输入两组数据： 0.5, 0.7

2.1, 2.3

```

/* xt020403.cpp */

```

```

#include <stdio.h>
void main()
{   int i,j,k,n;
    for(n=100;n<=999;n++)
    {i=n/100;
     j=n/10-i*10;
     k=n%10;
     if(n==i*i*i+j*j*j+k*k*k)
        printf("%d\n",n);
    }
}

/* xt020404.cpp */
#include <stdio.h>
#include <math.h>
#define EPS 1.0e-6
void main()
{
    float e=1,t;
    long int j=1,n=1;
    do
    { j=j*n;
      t=1.0/j;
      e=e+t;
      n++;
    }while ( fabs(t) >= EPS );
    printf("e=%f\n",e);
}

/* xt020405.cpp */
#include <stdio.h>
void main()
{   int num=1;
    do
    {   if((num+3)%5==0&&(num-3)%6==0)
        break;
        num+=1;
    }while(1);
    printf("num=%d\n",num);
}

/* xt020406.cpp */
#include <stdio.h>
void main()
{   int num;
    for(num=1;num<=99;num++)

```

```

        if(num*num%10==num||num*num%100==num)
            printf("%4d,%5d",num,num*num);
    printf("\n");
}
/* xt020407.cpp */
#include <stdio.h>
void main()
{
    int n,k=1;
    float s=0;
    for(n=1;n<=10000;n++)
    {
        s=s+1.0/(2.0*n-1)*k;
        k=-k;
    }
    printf("PI=%f\n",4*s);
}
/* xt020408.cpp */
#include <stdio.h>
void main()
{
    int n10,n5,n2,n1;
    for(n10=1;n10<=9;n10++)
        for(n5=1;n5<=17;n5++)
            for(n2=1;n2<=37;n2++)
                {
                    n1=40-n10-n5-n2;
                    if(n1>=1&&10*n10+n5*5+n2*2+n1==100)
                        printf("n10=%d,n5=%d,n2=%d,n1=%d\n",n10,n5,n2,n1);
                }
}
/* xt020409.cpp */
#include <stdio.h>
void main()
{
    float sn=100,hn=sn/2;
    int n=2;
    while(n<=10)
    {
        sn+=2*hn;
        hn=hn/2;
        n++;
    }
    printf("%f,%f\n",sn,hn);
}
/* xt020410.cpp */
#include <stdio.h>
void main()
{
    int day,x1,x2=1;
    for(day=9;day>0;day--)

```

```

        { x1=(x2+1)*2;
          x2=x1;
        }
    printf("Total=%d\n",x1);
}

```

习题 3

四、程序设计题

//xt 030401.cpp

```

#include <stdio.h>
#include <stdlib.h>
#include <time.h>
void main(void)
{
    int num[10], a;;
    srand((unsigned)time(NULL));

    printf("请输入一个 2 位数，试试您是否能中奖：");

    scanf("%d",&a);
    for(int i=0;i<10;i++)
        { num[i] = (rand()+10)%100;
          if(a == num[i])

              printf("猜中一个数  %d  下标是  %d",a,i);

        }
    }
    printf("-----\n");
    for( i=0; i<10; i++)
        printf("%d\t ",num[i]);
}

```

//xt 030402.cpp

```

#include <stdio.h>
#include <stdlib.h>
#include <time.h>
void main(void)
{ int a[5]={23,45,60,67,88},x,i,j,yes=0;
  for(i=0;i<5;i++)
      printf("%d,",a[i]);
      printf("\nwhich number do you want to delete?\n");
      scanf("%d",&x);

```

```

for(i=0;i<5;i++)
    if(a[i]==x)
    { yes=1;
for(j=i;j<5;j++) a[j]=a[j+1];
    }
if(yes==1) for(i=0;i<4;i++) printf("%d",a[i]);
    else printf("The number you want doesn't exist");
}

```

~~11xt~~ 030403.cpp

```

#include <stdio.h>
#include <stdlib.h>
#include <time.h>
#define SIZE 1000
void main()
{
    int x,a[SIZE],size,sum=0;
    srand((unsigned)time(NULL));
    while((size=rand()%1000)>200);
    printf("\nRandomiz list size(<1000):%d",size);
    printf("\nAuto make a %d size of list:\n",size);
    for(x=0;x<size;x++)
    { a[x]=rand()%1000 ;
    printf("%d\t",a[x]);
    sum+=arr[x];
    }
    printf("\nThe sum of array elements is %d", sum);
}

```

~~11xt~~ 030404.cpp

```

#include <stdio.h>
#include <stdlib.h>
#include <time.h>
#define SIZE 100
void main()
{
    int x,a[SIZE],max=0,min=1000,b1,b2;
    srand((unsigned)time(NULL));
    printf("\nAuto make a %d size of list:\n",size);
    for(x=0;x<SIZE;x++)
    { a[x]=rand()%1000 ;
    printf("%d\t",a[x]);
    }
    for(x=0;x<SIZE;x++)

```

```

    {
        if(a[x]>max)    max=a[x],b1=x;
        if(a[x]<min)    min=a[x],b2=x;
    }
printf("\nThe array elements max= %d in %d \n min=%d in %d\n",max,b1,min,b2);
}

```

//x 030405.cpp

```

#include <stdio.h>
#define SIZE 100
#define KIND 5
void main()
{
    int x,y,len,total[KIND+1];
    int a[]={1,1,1,1,2,2,2,3,5,5,5,5,1,1,3,3,3,3,3,2,2,2,5,5,5};
    len=sizeof(a)/sizeof(a[0]);
    for(x=0;x<KIND+1;x++)
    {
        total[x]=0 ;
    }
    for(y=1;y<KIND+1;y++)
    {
        for(x=0;x<len;x++)
        {
            if (a[x]==y) total[y]++;
        }
    }
    printf("\nThe list kinded:\n");
    for(x=0;x<len;x++) printf(" %d  ",a[x]);
    printf("\nThe total result: ");
    for(x=1;x<KIND+1;x++) printf(" %d-%d,  ",x,total[x]);
}

```

//x 030406.cpp

```

#define N 26
#include <stdio.h>
int main(void)
{
    static int a[N+1],b[N+1];
    int i,j,s,m,p;
    scanf("%d%d",&s,&m);
    for (i=1;i<=N;i++) a[i]=i;
    i=s-1;j=0;p=0;
    while (p<N)
    {
        i++;
        bh:
    }
}

```



```

        if (i>N) i-=N;
        if (a[i]==0) {i++;goto bh;}
        j++;
        if (j%m==0){ p++;b[p]=a[i];a[i]=0;j=0; }
    }
    for (i=1;i<=N;i++) printf("%3d",b[i]);
    printf("\n");
}

```

//xt 030407.cpp

```

#include <stdio.h>
void main()
{
    int i,j,s=0,ave,v[3];
    static int a[5][3]={ {80,75,92},{61,65,71},{59,63,70},{85,87,90},{76,77,85} };
    for(i=0;i<3;i++)
    {   for(j=0;j<5;j++){
            s=s+a[j][i];
        v[i]=s/5;
        s=0;
    }
    ave=(v[0]+v[1]+v[2])/3;
    printf("math:%d\nc language:%d\ndbase:%d\n",v[0],v[1],v[2]);
    printf("total ave:%d\n",ave);
}

```

//xt 030408.cpp

```

#include <stdio.h>
void main()
{
    int i,j,a[10][10], b[]={1,2,3,4,5,6,7,8,9,10};
    for(i=0;i<10;i++) a[0][i]=b[i];
    for(i=1;i<10;i++)
        for(j=0;j<10;j++)
            if(i>j) a[i][j]=a[j][i];
        else a[i][j]=a[i-1][j-1];
    for(i=0;i<10;i++)
        {   for(j=0;j<10;j++)
                printf("%d\t",a[i][j]);
            printf("\n");
        }
}

```

//xt 030409.cpp

```

#include <stdio.h>
#include <stdlib.h>
#include <time.h>
#define SIZE 5000
#define N 7
void main()
{
    int x,y,a[N]={0,0,0,0,0,0,0},s;
    srand((unsigned)time(NULL));
    x=0;
    while(x<SIZE)
    { s=rand()%6+1;
      if(s>0&&s<7)
        { a[s]++;
          x++;
        }
    }
    printf("\nRandomiz 1-6 list \n");
    for(x=1;x<N;x++)
    {
        s=a[x]*0.07;
        for(y=0;y<s;y++)
            printf("%d",x);
        printf("\t%d\t%2.1f%%\n",a[x],(float)a[x]*100/SIZE);
    }
}

```

11st 030410.cpp

```

#include <stdio.h>
#define N 20
int main()
{
    int x,s,tag;
    char a[N];
    printf("Please input numbers and it's length less then %d:",N-1);
    s=1;
    while(s<N)
    { scanf("%c",&a[s]);
      if(a[s]==10)break;
      s++;
    }
    printf("\nThe numbers is :\n");
    for(x=1;x<s;x++)
    {

```

```

        printf("%c",a[x]);
    }
    tag=0;
    for(x=1;x<s/2;x++)
    {
        if(a[x]!=a[s-x])
        { tag=1;
          break;
        }
    }
    if(tag==0)printf("\nThe number is palindrome!");
    else printf("\nThe number isn't palindrome!");
}

```

习题 4

四、程序设计题

~~11/21~~ 040401.cpp

```

#include <stdio.h>
void main( )
{ void dis(int n);
  int n;
  scanf("%d",&n);
  dis(n);
}
void dis(int n)
{ int k0,k,sum,i;
  k0=1;
  do
  { k=k0;
    sum=0;
    for(i=1;i<=n;i++)
    { sum=sum+k;
      k=k+2;
    }
    if(sum==n*n*n)
      break;
    else
      k0=k0+2;
  } while(1);
  for(i=1;i<=n;i++)
  { printf("%5d",k0);

```

```

        k0=k0+2;
    }
}

```

//xt 040402.cpp

```

#include <stdio.h>
void main( )
{
    float h(int n,float x);
    int n;
    float x;
    scanf("%d,%f",&n,&x);
    printf("h(%d,%f)=%f",n,x,h(n,x));
}
float h(int n,float x)
{
    if(n==0)
        return 1;
    else if(n==1)
        return(2*x);
    else
        return(2*x*h(n-1,x)-2*(n-1)*h(n-2,x));
}

```

//xt 040403.cpp

```

#include <stdio.h>
void main()
{
    int f(int n);
    int i;
    for(i=2;i<=1000;i++)
        if(f(i))
            printf("%6d",i);
}
int f(int n)
{
    if(n==n*n%10||n==n*n%100||n==n*n%1000)
        return 1;
    else
        return 0;
}

```

//xt 040404.cpp

```

#include <stdio.h>
void main( )
{
    long fun(int a,int n);
    int k,n;
    scanf("%d,%d",&k,&n);
}

```

```

        printf("%ld\n",fun(k,n));
    }
    long fun(int a, int n)
    {   int j;
        long s=0,t=0;
        for(j=1;j<=n;j++)
        {   t=t*10+a;
            s=s+t;
        }
        return s;
    }
}

```

//x 040405.cpp

```

#include <math.h>
#include <stdio.h>
void main()
{   int num,middle1,middle2;
    int detect(int d);
    printf("Please input a positive even number(>=6):");
    scanf("%d",&num);
    for(middle1=2;middle1<=num/2;middle1+=1)
        if(detect(middle1))
        {   middle2=num-middle1;
            if(detect(middle2))
            {   printf("%d=%d+%d\n",num,middle1,middle2);
                break;
            }
        }
    }
}

int detect(int d)
{   int i;
    for(i=2;i<=sqrt(d*1.0);i++)
        if(d%i==0)
            return(0);
    return 1;
}

```

//x 040406.cpp

```

#include <stdio.h>
void main()
{   float f(float x,int n);
    float x,an;
    int n;
    scanf("%f,%d",&x,&n);

```

```

        an=f(x,n);
        printf("an=%f\n",an);
    }
float f(float x,int n)
{
    if(n==0)
        return 1;
    else
        return x/n*f(x,n-1);
}

```

//x 040407.cpp

```

#include <stdio.h>
void main()
{
    float f(float x,int n);
    float x,fn;
    int n;
    scanf("%f,%d",&x,&n);
    fn=f(x,n);
    printf("an=%f\n",fn);
}
float f(float x,int n)
{
    if(n==0)
        return 1;
    else if(n>0)
        return x*f(x,n-1);
    else
        return f(x,n+1)/x;
}

```

//x 040408.cpp

```

#include <stdio.h>
void main( )
{
    void f(int n);
    int n;
    scanf("%d",&n);
    while(n<=0)
        scanf("%d",&n);
    f(n);
}
void f(int n)
{
    if(n/10==0)
        putchar(n%10+'0');
    else
        {
            putchar(n%10+'0');

```

```

        f(n/10);
    }
}

//xt 040409.cpp

```

```

#include <stdio.h>
void main( )
{
    void f(int n);
    int n;
    scanf("%d",&n);
    while(n<=0)
        scanf("%d",&n);
    f(n);
}
void f(int n)
{
    if(n/10)
        f(n/10);
    putchar(n%10+'0');
}

```

```

//xt 040410.cpp
#include <stdio.h>
void main()
{
    int f(int n);
    int n;
    for(n=2;n<=1000;n++)
        if(f(n))

            printf("%d is a 完数\n",n);
}
int f(int n)
{
    int i,s=0;
    for(i=1;i<n;i++)
        if(n%i==0)
            s=s+i;
    if(s==n)
        return 1;
    else
        return 0;
}

```

习题 5

四、程序设计题

//x 050401.cpp

```
#include "stdio.h"
void main()
{   void f(int,int,int);
    int a,b,c;
    void (*p)(int,int,int);
    scanf("%d%d%d",&a,&b,&c);
    p=f;
    (*p)(a,b,c);
}
void f(int x,int y,int z)
{   int t;
    if(x<y)
        t=x,x=y,y=t;
    if(y<z)
        t=z,z=y,y=t;
    if(x<y)
        t=x,x=y,y=t;
    printf("%5d%5d%5d\n",x,y,z);
}
```

//x 050402.cpp

```
#include <stdio.h>
int max(int a,int b)
{   if(a>b)
        return a;
    else
        return b;
}
void main()
{   int max(int a,int b);
    int (*pmax)(int,int);
    int x,y,z;
    pmax=max;
    printf("input two numbers:\n");
    scanf("%d%d",&x,&y);
    z=(*pmax)(x,y);
    printf("maxmum=%d",z);
}
```

//x 050403.cpp

```
#include "stdio.h"
void gcd(int x,int y)
```



```

{   int temp;
    while(y!=0)
    {   temp=x%y;
        x=y;
        y=temp;
    }
    printf("The greatest common divisor is:%d\n",x);
}

void lcm(int x,int y)
{   int temp,m,n;
    m=x;
    n=y;
    while(x!=0)
    {   temp=y%x;
        y=x;
        x=temp;
    }
    printf("The lowest common multiple is:%d\n",m*n/y);
}

void main()
{   int a,b;
    void (*p)(int,int);
    printf("Please input a and b:");
    scanf("%d%d",&a,&b);
    if(a>b)
        p=gcd;
    else
        p=lcm;
    (*p)(a,b);
}

```

//xt 050404.cpp

```

#include "stdio.h"
void main()
{   int x,y;
    int sum(int,int),diff(int,int),product(int,int);
    void mma(int x,int y,int s(int,int));
    printf("Please input x,y:\n");
    scanf("%d%d",&x,&y);
    printf("The sum of x and y is:");
    mma(x,y,sum);
    printf("The difference of x and y is:");
    mma(x,y,diff);
    printf("The product of x and y is:");
}

```

```

        mma(x,y,product);
    }
int sum(int x,int y)
{
    return x+y;
}
int diff(int x,int y)
{
    return x-y;
}
int product(int x,int y)
{
    return x*y;
}
void mma(int a,int b,int s(int,int))
{
    int w;
    w=s(a,b);
    printf("%d\n",w);
}

```

~~11/11~~ 050405.cpp

```

#include <stdio.h>
double func1(int x),func2(int y);
void main()
{
    double  (*fptr)(int); /*定义指向函数的指针变量 fptr*/
    int n;
    printf("input a number : ");
    scanf("%d",&n);
    if(n>1)
    {
        if(n%2==0)
            fptr=func1; /*n 为偶数, 指针变量 ptr 指向函数 func1()*/
        else
            fptr=func2; /*n 为奇数, 指针变量 ptr 指向函数 func2()*/
        printf("value=%9.4f\n",(*fptr)(n));
    }
    else
        printf("error!\n");
}
double func1(int x)
{
    int k;
    double value;

```

```

        value=1.0;
        for(k=2;k<=x;k=k+2)
            value=value+1/(double)k;
        return value;
    }
double func2(int y)
{
    int k;
    double value;
    value=1.0;
    for(k=3;k<=y;k=k+2)
        value=value+1/(double)k;
    return value;
}

```

//xt 050406.cpp

```

#include "stdio.h"
#include "math.h"
void main()
{
    int n,yinzi(int),(*f)(int);
    f=yinzi;
    printf("input a number n:");
    scanf("%d",&n);
    if((*f)(n)==2)
        printf("\n%d is a prime number.",n);
    else
        printf("\n%d is not a prime number.",n);
}
int yinzi(int x)
{
    int i,k=0,q=(int)sqrt(x);
    for(i=1;i<=q;i++)
        if(x%i==0)
        {
            k+=2;
            printf("%5d%5d",i,x/i);
        }
    return k;
}

```

//xt 050407.cpp

```

#include <stdio.h>
#include <math.h>
double f1(double x)
{
    return x*x*log(x);
}

```

```

double f2(double x)
{
    return x*sin(x);
}
double f3(double x)
{
    return x/exp(x);
}
double collect(double (*p)(double x),double a,double b,double n)
{
    int i;
    double h,area;
    h=(b-a)/n;
    area=((*p)(a)+(*p)(b))/2.0;
    for(i=1;i<n;i++)
        area+=(*p)(a+i*h);
    return(area*h);
}
void main()
{
    double y1,y2,y3;
    y1=collect(f1,1.0,2.0,1000);
    y2=collect(f2,0.0,3.0,500);
    y3=collect(f3,0.0,1.0,10000);
    printf("y1=%6.2f  y2=%6.2f  y3=%6.2fn",y1,y2,y3);
}

```

11/11 050408.cpp

```

#include "stdio.h"
#include "math.h"
int root(double *x,int m,double eps,double (*f)(double))
{
    double x0;
    do
    {
        x0=*x;
        *x=(*f)(x0);
        m=m-1;
    }while((m!=0)&&(fabs(*x-x0)>=eps));
    if(m==0) return (0);
    return (1);
}
double f1(double x)
{
    return(1.0+atan(x));
}
double f2(double x)
{

```

```

        return(0.5*cos(x));
    }
double f3(double x)
{
    return((6.0+3*x-x*x)/4);/* x=(6+3*x-x*x)/4*/
}

```

```

void main()
{
    double x,(*p)(double);
    x=1.0;
    p=f1;
    if(root(&x,50,0.00001,p))
        printf("x1=%f\n",x);
    p=f2;
    if(root(&x,50,0.00001,p))
        printf("x1=%f\n",x);
    p=f3;
    if(root(&x,50,0.00001,p))
        printf("x1=%f\n",x);
}

```

//xt 050409.cpp

```

#include "stdio.h"
int * f(int p[],int q[],int m)
{
    int i;
    for(i=0;i<m;i++)
        q[i]=p[i]*p[i];
    return q;
}
void main()
{
    int a[6]={1,2,3,4,5,6},i,*k;
    int b[6];
    k=f(a,b,6);
    for(i=0;i<6;i++)
        printf("%5d",k[i]);
}

```

//xt 050410.cpp

```

#include <stdio.h>
#include <stdlib.h>
void main()
{
    int wanshu(int x);
    int *ptr;
    ptr=(int *)malloc(sizeof(int));
}

```

```

if(ptr==NULL)
{   printf("Failed to create a new object.");
    exit(0);
}
scanf("%d",ptr);
if(wanshu(*ptr))

    printf("%d is a 完数:",*ptr);

else

    printf("%d is not a 完数:",*ptr);

free(ptr);
}
int wanshu(int x)
{   int i=1,sum=0;
    while(i<x)
    {   if(x%i==0)
        sum+=i;
        i++;
    }
    if(sum==x)
        return 1;
    else
        return 0;
}

```

习题 6

四、程序设计题

11.11 060401.cpp

```

#include <stdio.h>
void main()
{   int yh[11],row,col,i;
    *(yh+1)=1;
    for(i=0;i<40-2;i++)
        printf(" ");
    printf("%4d\n",*(yh+1));
    for(row=2;row<=10;row++)
    {   *(yh+row)=1;        /*每行的最后一个元素值为 1*/

```

```

        for(col=row-1;col>=2;col--)      /*生成一行*/

            *(yh+col)=*(yh+col)+*(yh+col-1);
        for(i=0;i<40-2*row;i++) /*输出合适的空格*/

            printf(" ");

        for(col=1;col<=row;col++)      /*输出一行*/

            printf("%4d",*(yh+col));
        printf("\n");
    }
}

```

//xt 060402.cpp

```

#include <stdio.h>
#include <stdlib.h>
#include <time.h>
void main()
{
    int a[10][5],b[10],i,j;
    srand(time(NULL));
    for(i=0;i<10;i++)
        for(j=0;j<5;j++)
            *(a[i]+j)=rand()%100;
    for(i=0;i<10;i++)
    {
        *(b+i)=a[i][0];
        for(j=0;j<5;j++)
            if(*(b+i)<*(*(a+i)+j))
                *(b+i)=*(*(a+i)+j);
    }
    for(i=0;i<10;i++)
    {
        for(j=0;j<5;j++)
            printf("%4d",a[i][j]);
        printf("\t%4d\n",b[i]);
    }
}

```

//xt 060403.cpp

```

#include <stdio.h>
#include <stdlib.h>
#include <time.h>
int delmem(int *v,int n,int del);
void main()
{
    int *a,i,n,del;
    srand(time(NULL));

```

```

printf("请输入处理的数组长度:");

scanf("%d",&n);
a=(int *)malloc(sizeof(int)*n);
for(i=0;i<n;i++)
    *(a+i)=rand()%100;

printf("删除操作前的数据如下所示:\n");

for(i=0;i<n;i++)
    printf("%4d",*(a+i));

printf("\n 请输入欲删除的元素值:");

scanf("%d",&del);
n=delmem(a,n,del);

printf("删除操作后的数据如下所示:\n");

for(i=0;i<n;i++)
    printf("%4d",*(a+i));
printf("\n");
}
int delmem(int *v,int n,int del)
{
    int i,j;
    for(i=0;i<n;i++)
        if(*(v+i)==del)
        {
            for(j=i;j<n-2;j++)
                *(v+j)=*(v+j+1);
            n--,i--;
        }
    return n;
}

```

~~//xt~~ 060404.cpp

```

#include <stdio.h>
#include <stdlib.h>
#include <time.h>
#define N 15
void main()
{
    int score[N][4]={0},i,j,x;
    srand(time(NULL));
    for(i=0;i<N;i++)
        for(j=0;j<3;j++)
        {
            x=rand()%100;
            if(x<50)
                j--;
        }
}

```



```

        else
            score[i][j]=x;
    }
    for(i=0;i<N;i++)
        for(j=0;j<3;j++)
            (*(score+i)+3)+=*(score+i+j);
    printf("score1\tsocre2\tsocre3\tscore3\tscore4\tscore5\n");
    for(i=0;i<N;i++)
    {
        for(j=0;j<4;j++)
            printf("%d\t",*(score+i+j));
        printf("\n");
    }
}

```

~~11x1~~ 060405.cpp

```

#include <stdio.h>
#include <stdlib.h>
#include <time.h>
#define N 15
void main()
{
    int score[N][4]={0},i,j,x;
    int t[4];
    srand(time(NULL));

    for(i=0;i<N;i++)    //生成模拟成绩数据

        for(j=0;j<3;j++)
        {
            x=rand()%100;
            if(x<50)
                j--;
            else
                score[i][j]=x;
        }

    for(i=0;i<N;i++)    //统计每个学生的总分

        for(j=0;j<3;j++)
            (*(score+i)+3)+=*(score+i+j);
    for(i=0;i<N-1;i++)
    {
        x=i;
        for(j=i+1;j<N;j++)
            if(score[j][3]>score[x][3])
                x=j;
        if(x!=i)
            for(j=0;j<4;j++)
            {
                *(t+j)=*(score+x+j);
            }
    }
}

```

```

                (*(score+x)+j)=*(*(score+i)+j);
                (*(score+i)+j)=*(t+j);
            }
        }
    printf("score1\tsocre2\tsocre3\tscore3\tscore4\n");
    for(i=0;i<N;i++)
    {
        for(j=0;j<4;j++)
            printf("%d\t",*(*(score+i)+j));
        printf("\n");
    }
}

```

//xt 060406.cpp

```

#include <stdio.h>
#include <stdlib.h>
void main()
{
    int *ArrayCat(int *s,int slen,int *t,int tlen);
    int a[]={1,3,5,7,9},b[]={2,4,6,8,10},*p=NULL,i;
    p=ArrayCat(a,sizeof(a)/sizeof(int),b,sizeof(b)/sizeof(int));
    for(i=0;i<(sizeof(a)+sizeof(b))/sizeof(int);i++)
        printf("%4d",p[i]);
    printf("\n");
}
int *ArrayCat(int *s,int slen,int *t,int tlen)
{
    int *st,i;
    st=(int *)malloc(sizeof(int)*(slen+tlen));
    for(i=0;i<slen;i++)
        st[i]=*(s+i);
    for(i=slen;i<slen+tlen;i++)
        st[i]=*(t+i-slen);
    return st;
}

```

//xt 060407.cpp

```

#include <stdio.h>
#include <stdlib.h>
#include <time.h>
void main()
{
    void reverse(int *v,int n);
    int *a,n,i;
    srand(time(NULL));

    printf("请输入数组的长度: ");

    scanf("%d",&n);
}

```

```

a=(int *)malloc(sizeof(int)*n);
for(i=0;i<n;i++)
    a[i]=rand()%100;
for(i=0;i<n;i++)
    printf("%4d",a[i]);
printf("\n");
reverse(a,n);
for(i=0;i<n;i++)
    printf("%4d",a[i]);
printf("\n");
}
void reverse(int *v,int n)
{
    int i,j,t;
    for(i=0,j=n-1;i<j;i++,j--)
        t=*(v+i),*(v+i)=*(v+j),*(v+j)=t;
}

```

//xt 060408.cpp

```

#include <stdio.h>
#include <stdlib.h>
#include <time.h>
int *ArrayCopy(int *source,int n);
void main()
{
    int *a,*b=NULL,n,i;
    srand(time(NULL));

    printf("请输入被拷贝的数组长度: ");

    scanf("%d",&n);
    a=(int *)malloc(sizeof(int)*n);
    for(i=0;i<n;i++)
        *(a+i)=rand()%100;
    b=ArrayCopy(a,n);
    for(i=0;i<n;i++)
        printf("%4d",b[i]);
    printf("\n");
}
int *ArrayCopy(int *source,int n)
{
    int i,*target;
    target=(int *)malloc(sizeof(int)*n);
    for(i=0;i<n;i++)
        target[i]=source[i];
    return target;
}

```

//xt 060409.cpp

```

#include <stdio.h>
#include <stdlib.h>
#include <time.h>
void sort(int v[],int n);
void reverse(int v[],int n);
void main()
{   int *data,i,n;
    srand(time(NULL));

    printf("请输入需要处理的数据个数: ");

    scanf("%d",&n);
    data=(int *)malloc(sizeof(int)*n);
    for(i=0;i<n;i++)
        *(data+i)=rand()%100;

    printf("排序前的数据如下所示: \n");

    for(i=0;i<n;i++)
        printf("%4d",data[i]);
    sort(data,n);
    reverse(data,n);

    printf("\n 排序后的数据如下所示: \n");

    for(i=0;i<n;i++)
        printf("%4d",data[i]);
    printf("\n");
}
void sort(int v[],int n)
{   int i,j,k,temp;
    for (i=0; i<n; i++)
    {   k=i;
        for(j=i+1;j<n;j++)
            if(v[j]<v[k])
                k=j;
        if(k!=i)
            temp=v[i],v[i]=v[k],v[k]=temp;
    }
}
void reverse(int v[],int n)
{   int i,j;
    for(i=0,j=n-1;i<j;i++,j--)
        v[i]=v[i]+v[j],v[j]=v[i]-v[j],v[i]=v[i]-v[j];
}

```

//xt 060410.cpp

```

#include <stdio.h>
#include <stdlib.h>
#include <time.h>
void sort(int v[],int n);
void reverse(int v[],int n);void main()
{   int m,n,i,j,**row;
    srand(time(NULL));

    printf("请输入二维数组的行数: ");

    scanf("%d",&m);

    printf("请输入二维数组的列数: ");

    scanf("%d",&n);
    row=(int **)malloc(sizeof(int*)*m);
    for(i=0;i<m;i++)
        row[i]=(int *)malloc(sizeof(int)*n);
    for(i=0;i<m;i++)
        for(j=0;j<n;j++)
            row[i][j]=rand()%100;
    for(i=0;i<m;i++)
        if(i%2==0)
            sort(row[i],n);
        else
        {   sort(row[i],n);
            reverse(row[i],n);
        }
    for(i=0;i<m;i++)
    {   for(j=0;j<n;j++)
        printf("%4d",row[i][j]);
        printf("\n");
    }
}
void sort(int v[],int n)
{   int i,j,k,temp;
    for (i=0; i<n; i++)
    {   k=i;
        for(j=i+1;j<n;j++)
            if(v[j]<v[k])
                k=j;
        if(k!=i)
            temp=v[i],v[i]=v[k],v[k]=temp;
    }
}
void reverse(int v[],int n)

```

```

{   int i,j;
    for(i=0,j=n-1;i<j;i++,j--)
        v[i]=v[i]+v[j],v[j]=v[i]-v[j],v[i]=v[i]-v[j];
}

```

习题 7

四、程序设计题

//xt 070401.cpp

```

#include <stdio.h>
int find_char( char *str,int ch)
{   int k,num=0;
    for(k=0;str[k]!='\0';k++)
        if(str[k]==ch)
            num++;
    return num;
}
void main( )
{   char s[100];
    int num,c;
    printf("\nInput a String:");
    gets(s);
    printf("\nInput a character:");
    c=getchar();
    num=find_char(s,c);
    printf("\nnum=%d",num);
}

```

//xt 070402.cpp

```

#include <stdio.h>
#include <string.h>
void main()
{   char s1[50],s2[50];
    int k,t;
    puts("\nInputs string s1:");
}

```

```

    gets(s1);
    puts("\nInputs string s2:");
    gets(s2);
    k=0;
    while(s1[k]==s2[k]&& s1[k]!=0)
        k++;
    t=s1[k]-s2[k];
    printf("\nt=%d",t);
}

```

//xt 070403.cpp

```

#include <stdio.h>
char *Myitoa(int n,char *p)
{
    int k,len=-1,t;
    t=n;
    do
    {
        n=n/10;
        len++;
    }while(n>0);
    *(p+len+1)=0;
    do
    {
        k=t%10;
        t=t/10;
        *(p+len)=k+48;
    }while(--len>=0);
    return p;
}
void main()
{
    char string[20];
    int k=12345;
    Myitoa(k,string);
    printf("%s",string);
}

```

//xt 070404.cpp

```

#include <stdio.h>
#include <string.h>
int IsAplidrome(char *word)
{
    char *head,*end;
    int len,flag=1;
    len=strlen(word);
    head=word;
    end=head+len-1;
    while(*head==' ')

```

```

        head++;
    if(head>end)
        return 0;
    while(*end==' ')
        end--;
    for(;head<end;)
    {   if(*head!=*end)
        {   flag=0;
            break;
        }
        head++;
        end--;
    }
    return flag;
}
void main()
{   char word[80];
    printf("Input a word:");
    gets(word);
    if(IsAplidrome(word))
        printf("\n%s is a palindrome.",word);
    else
        printf("\n%s is not a palindrome.",word);
}

```

///xt 070405.cpp

```

#include <stdio.h>
int Isdigit(char c)
{   if(c>='0'&&c<='9')
    return 1;
    return 0;
}
void main()
{   char p[80],tmp[80],*s=p,flag=0;
    int num=0;
    gets(s);
    while(*s)
    {   if(Isdigit(*s))
        {   tmp[num]=*s;
            num++;
            flag=1;
        }
        if(flag&&Isdigit(*(s+1))==0)
        {   tmp[num]='\0';

```



```

        printf("\n%s",tmp);
        flag=0;
        num=0;
    }
    s++;
}
}

```

//x 070406.cpp

```

#include <stdio.h>
#include <string.h>
void invertp(char *p)
{
    static int len,k=0;
    int tmp;
    len=strlen(p);
    if(k>len/2-1)
        return;
    tmp=*(p+k);
    *(p+k)=*(p+len-k-1);
    *(p+len-k-1)=tmp;
    k++;
    invertp(p);
}
void main()
{
    char string[80]="1234567";
    invertp(string);
    printf("\nThe new string is:%s",string);
}

```

//x 070407.cpp

```

#include <stdio.h>
void Myput(char *s)
{
    while(*s!='\0')
        printf("%c",*s++);
    printf("\n");
}
void main()
{
    char word[80]="How are You!";
    Myput(word);
}

```

//x 070408.cpp

```

#include <stdio.h>
#include <string.h>

```

```

void main()
{ char s[100];
  int k;
  printf("\nInput String s:");
  gets(s);
  for(k=0;s[k]!=0;k++)
  {
    if(s[k]>='A'&&s[k]<='U')
    { s[k]+=5;
      continue;
    }
    if(s[k]>='V'&&s[k]<='Z')
      s[k]=s[k]+5-26;
  }
  printf("\nThe new string is:%s",s);
}

```

~~//st~~ 070409.cpp

```

#include <stdio.h>
#include <string.h>
#include <stdlib.h>
void to_lowercase(char *s)
{ while(*s)
  { if(*s>='A'&&*s<='Z')
    *s+=32;
    s++;
  }
}
int My_Find(char *p1,char *p2)
{ char *s1,*s2,*p,*t1,*t2;
  int len2,num=0;
  s1=(char *)malloc(strlen(p1)+1);
  s2=(char *)malloc(strlen(p2)+1);
  t1=s1;
  t2=s2;
  strcpy(s1,p1);
  strcpy(s2,p2);
  to_lowercase(s1);
  to_lowercase(s2);
  len2=strlen(p2);
  while((p=strstr(s1,s2))&&len2!=0)
  { num++;
    s1=p+strlen(s2);
  }
}

```

```

        free(t1);
        free(t2);
        return num;
    }
void main()
{
    char s1[100],s2[50];
    int len2;
    printf("\nInput String s1:");
    gets(s1);
    printf("\nInput string s2:");
    gets(s2);
    len2=My_Find(s1,s2);
    printf("\nnum=%d",len2);
}

```

//xt 070410.cpp

```

#include <stdio.h>
#include <string.h>
void main()
{
    char word[80];
    int max=0,len,k=0,ptmp;
    puts("Input a string:");
    gets(word);
    len=strlen(word);
    while(word[k])
    {
        while(word[k]==' ') k++;
        len=0;
        while(word[k]!=' '&&word[k])
        {
            len++;
            k++;
        }
        if(max<len)
        {
            max=len;
            ptmp=k-max;
        }
    }
    printf("\nThe word is:");
    for(k=ptmp;k<ptmp+max;k++)
        printf("%c",word[k]);
}

```

习题 8

四、程序设计题

//x 080401.cpp

```
#include <stdio.h>
struct comp
{
    double re;
    double im;
};
typedef struct comp COMP;
void main()
{
    COMP sub(COMP x,COMP y);
    COMP a,b,res;
    printf("Input complex num a:");
    scanf("%lf,%f",&a.re,&a.im);
    printf("Input complex num b:");
    scanf("%lf,%f",&b.re,&b.im);
    res=sub(a,b);
    printf("res.re=%g,res.im=%g\n",res.re,res.im);
}
COMP sub(COMP x,COMP y)
{
    COMP t;
    t.re=x.re-y.re;
    t.im=x.im-y.im;
    return t;
}
```

//x 080402.cpp

```
#include <stdio.h>
#include <malloc.h>
void main()
{
    struct node
    {
        int x;
        struct node *next;
    };
    int n;
    struct node *h=NULL,*p,*q;
    printf("Input a number: ");
    scanf("%d",&n);
    while(n)
    {
        p=(struct node *)malloc(sizeof(struct node));
        p->x=n;
        p->next=h;
        if(!h)
            h=p;
        else if(n<=h->x)
```

```

        {   p->next=h;
            h=p;
        }
        else
        {   q=h;
            while(q->next&& n>q->next->x)
                q=q->next;
            p->next=q->next;
            q->next=p;
        }
        printf("Input a number: ");
        scanf("%d",&n);
    }
    p=h;
    n=0;
    while(p)
    {   printf("%8d",p->x);
        if(++n%6==0)
            printf("\n");
        p=p->next;
    }
    printf("\n");
}

```

~~11st~~ 080403.cpp

```

#include <stdio.h>
#include <stdlib.h>
#define N 3
struct stud
{   char id[5];
    char name[20];
    int score[4];
    double ave;
};
void inputscore(struct stud *rec);
void printscore(struct stud *s);
void sum_ave(struct stud *s);
void main()
{   struct stud st[N];
    int i;
    for(i=0;i<N;i++)
        inputscore(&st[i]);
    sum_ave(st);
    printscore(st);
}

```

```

}
void inputscore(struct stud *rec)
{
    int i;
    char in_buf[10];
    gets(rec->id);
    gets(rec->name);
    for(i=0;i<4;i++)
    {
        gets(in_buf);
        rec->score[i]=atoi(in_buf);
    }
}
void sum_ave(struct stud *s)
{
    int k,i,sum;
    for(k=0;k<N;k++)
    {
        sum=0;
        for(i=0;i<4;i++)
            sum+=s[k].score[i];
        s[k].ave=sum/4;
    }
}
void printscore(struct stud *s)
{
    int i,k;
    for(k=0;k<N;k++)
    {
        printf("%s\t%s:",s[k].id,s[k].name);
        for(i=0;i<4;i++)
            printf("%5d",s[k].score[i]);
        printf("\t%f\n",s[k].ave);
    }
}

```

11/11 080404.cpp

```

#include <stdio.h>
#include <malloc.h>
#define N 10
void main()
{
    void reverse(int v[],int n);
    int arr[N],i;
    printf("Input the element of array:\n");
    for(i=0;i<N;i++)
        scanf("%d",&arr[i]);
    reverse(arr,N);
    for(i=0;i<N;i++)
        printf("%5d",arr[i]);
    printf("\n");
}

```

```

}
void reverse(int v[],int n)
{
    struct node
    {
        int x;
        struct node *next;
    };
    struct node *h=NULL,*p;
    int i;
    for(i=0;i<n;i++)
    {
        p=(struct node *)malloc(sizeof(struct node));
        p->x=v[i];
        p->next=h;
        h=p;
    }
    p=h;
    for(i=0;p;i++,p=p->next)
        v[i]=p->x;
}

```

~~11st~~ 080405.cpp

```

#include <stdio.h>
#define N 3
struct stu
{
    long id;
    double shu,yu,ave;
};
void main()
{
    struct stu s[N];
    void sort(struct stu v[],int n);
    struct stu *p;
    for(p=s;p<s+N;p++)
    {
        scanf("%ld,%lf,%lf",&(p->id),&(p->shu),&(p->yu));
        p->ave=(p->shu+p->yu)/2;
    }
    sort(s,N);
    for(p=s;p<s+N;p++)
        printf("%ld--%5.2f %5.2f %5.2f\n",p->id,p->shu,p->yu,p->ave);
}
void sort(struct stu v[],int n)
{
    int i,j,k;
    struct stu t;
    for(i=0;i<n-1;i++)
    {
        k=i;
        for(j=i+1;j<n;j++)

```

```

        if((*v+j)).ave>(*v+k).ave)
            k=j;
        if(k!=i)
            t=*(v+i),*(v+i)=*(v+k),*(v+k)=t;
    }
}

```

~~11st~~ 080406.cpp

```

#include <stdio.h>
#include <stdlib.h>
struct list
{
    int d;
    struct list *link;
};
typedef struct list L;
void main()
{
    L *createlist();
    void printlist(L *h);
    L *head;
    head=createlist();
    printlist(head);
}
L *createlist()
{
    L *p,*q,*ph;
    int a;
    ph=(L *)malloc(sizeof(L));
    p=q=ph;
    printf("Input the element of list,-1 for end.\n");
    scanf("%d",&a);
    while(a!=-1)
    {
        p=(L *)malloc(sizeof(L));
        p->d=a;
        q->link=p;
        q=p;
        scanf("%d",&a);
    }
    p->link=NULL;
    return ph;
}
void printlist(L *h)
{
    L *p=h->link;
    while(p!=NULL)
    {
        printf("%5d",p->d);
        p=p->link;
    }
}

```



```

    }
    printf("\n");
}

```

~~11/21~~ 080407.cpp

```

#include <stdio.h>
#include <stdlib.h>
struct list
{
    int d;
    struct list *link;
};
typedef struct list L;
void main()
{
    L *createlist();
    void printlist(L *h);
    void insert(L *h,int a,int key);
    int a,k;
    L *head;
    head=createlist();
    printf("Input value for Insert.\n");
    scanf("%d,%d",&a,&k);
    insert(head,a,k);
    printlist(head);
}
L *createlist()
{
    L *p,*q,*ph;
    int a;
    ph=(L *)malloc(sizeof(L));
    p=q=ph;
    printf("Input the element of list,-1 for end.\n");
    scanf("%d",&a);
    while(a!=-1)
    {
        p=(L *)malloc(sizeof(L));
        p->d=a;
        q->link=p;
        q=p;
        scanf("%d",&a);
    }
    p->link=NULL;
    return ph;
}
void printlist(L *h)
{
    L *p=h->link;
    while(p!=NULL)

```

```

        {   printf("%5d",p->d);
            p=p->link;
        }
        printf("\n");
    }
void insert(L *h,int a,int key)
{   L *s,*p,*q;
    s=(L *)malloc(sizeof(L));
    s->d=key;
    q=h;
    p=h->link;
    if(p==NULL)
    {   s->link=p;
        q->link=s;
        return;
    }
    while(p->d!=a&& p->link!=NULL)
    {   q=p;
        p=p->link;
    }
    if(p->d==a)
    {   s->link=p;
        q->link=s;
    }
    else
    {   s->link=NULL;
        p->link=s;
    }
}

```

//rt 080408.cpp

```

#include <stdio.h>
#include <stdlib.h>
struct list
{   int d;
    struct list *link;
};
typedef struct list L;
void main()
{   L *createlist();
    void printlist(L *h);
    void insert(L *h,int a,int key);
    void reverselist(L *h);
    int a,k;

```

```

    L *head;
    head=createlist();
    printf("Input value for Insert.\n");
    scanf("%d,%d",&a,&k);
    insert(head,a,k);
    printlist(head);
    reverselist(head);
    printlist(head);
}
L *createlist()
{
    L *p,*q,*ph;
    int a;
    ph=(L *)malloc(sizeof(L));
    p=q=ph;
    printf("Input the element of list,-1 for end.\n");
    scanf("%d",&a);
    while(a!=-1)
    {
        p=(L *)malloc(sizeof(L));
        p->d=a;
        q->link=p;
        q=p;
        scanf("%d",&a);
    }
    p->link=NULL;
    return ph;
}
void printlist(L *h)
{
    L *p=h->link;
    while(p!=NULL)
    {
        printf("%5d",p->d);
        p=p->link;
    }
    printf("\n");
}
void insert(L *h,int a,int key)
{
    L *s,*p,*q;
    s=(L *)malloc(sizeof(L));
    s->d=key;
    q=h;
    p=h->link;
    if(p==NULL)
    {
        s->link=p;
        q->link=s;
        return;
    }

```

```

    }
    while(p->d!=a&& p->link!=NULL)
    {
        q=p;
        p=p->link;
    }
    if(p->d==a)
    {
        s->link=p;
        q->link=s;
    }
    else
    {
        s->link=NULL;
        p->link=s;
    }
}

void reverselist(L *h)
{
    L *p,*q;
    p=h->link;
    if(p!=NULL)
    {
        h->link=NULL;
        do
        {
            q=p->link;
            p->link=h->link;
            h->link=p;
            p=q;
        } while(p!=NULL);
    }
}

```

///xt 080409.cpp

```

#include <stdio.h>
#include <malloc.h>
typedef struct node
{
    int no;
    struct node *next;
}NODE;
void main()
{
    int n,start,end,i,count;
    NODE *h,*p,*tail,*newh;
    printf("Input the number of people: ");
    scanf("%d",&n);
    if(n<=0)
    {
        printf("n must be >=0!\n");
        return;
    }
}

```

```

printf("Input the starting point and ending point:");
scanf("%d,%d",&start,&end);
if(start<1||end<1)
{   printf("Data error!\n");
    return ;
}
newh=NULL;
tail=(NODE *)malloc(sizeof(NODE));
h=tail;
h->no=n;
for(i=n-1;i>=1;i--)
{   p=(NODE *)malloc(sizeof(NODE));
    p->no=i;
    p->next=h;
    h=p;
}
tail->next=h;
h=tail;
start=(start-1)%n;
for(i=0;i<start;i++)
    h=h->next;
for(count=n;count>1;count--)
{   start=(end-1)%count;
    for(i=0;i<start;i++)
        h=h->next;
    if(newh)
    {   tail->next=h->next;
        tail=h->next;
    }
    else
    {   newh=h->next;
        tail=newh;
    }
    h->next=h->next->next;
}
tail->next=h;
tail=h;
tail->next=NULL;
count=0;
if(n==1)
    newh=tail;
while(newh)
{   printf("%5d",newh->no);
    newh=newh->next;
}

```

```

        if(++count%6==0)
            printf("\n");
    }
    printf("\n");
}

```

//xt 080410.cpp

```

#include <stdio.h>
#include <malloc.h>
typedef struct node
{
    float coef;
    int exp;
    struct node *next;
}NODE;
void main()
{
    NODE *pa,*pb,*pc,*tail,*p,*q,*r;
    float coef;
    int exp,count;
    pa=(NODE *)malloc(sizeof(NODE));
    pa->coef=0.0;

    pa->exp=-1; /*建立多项式 A 的头节点*/

    tail=pa;
    do
    {
        printf("输入多项式 A 中每一项的系数和指数 (指数小于 0 时结束) :");

        scanf("%f,%d",&coef,&exp);
        if(exp<0)
            break;
        p=(NODE *)malloc(sizeof(NODE));
        p->coef=coef;
        p->exp=exp;
        tail->next=p;
        tail=p;
    }while(1);
    tail->next=NULL;

    pb=(NODE *)malloc(sizeof(NODE));
    pb->coef=0.0;

    pb->exp=-1; /*建立多项式 B 的头节点*/

    tail=pb;
    do
    {
        printf("输入多项式 B 中每一项的系数和指数 (指数小于 0 时结束) :");
    }
}

```

```

scanf("%f,%d",&coef,&exp);
if(exp<0)
    break;
p=(NODE *)malloc(sizeof(NODE));
p->coef=coef;
p->exp=exp;
tail->next=p;
tail=p;
}while(1);
tail->next=NULL;

if(pa->next==NULL)
    pc=pb;
else if(pb->next==NULL)
    pc=pa;
else
{
    pc=(NODE *)malloc(sizeof(NODE));
    pc->coef=0.0;

    pc->exp=-1; /* 建立多项式 C 的头节点 */

    pc->next=NULL;
    tail=pc;

    pa=pa->next;
    while(pa)
    {
        p=pb->next;
        while(p)
        {
            coef=pa->coef*p->coef;
            exp=pa->exp+p->exp;
            q=pc;
            while(q->next)
            {
                if(exp==q->next->exp)
                {
                    q->next->coef+=coef;
                    goto next;
                }
                else if(q->next->exp>exp)
                    break;
                else
                    q=q->next;
            }
            r=(NODE *)malloc(sizeof(NODE));
            r->coef=coef;
            r->exp=exp;
            r->next=q->next;

```

```

        q->next=r;
next:    p=p->next;
        }
        pa=pa->next;
    }
}
p=pc;
while(p->next)
{   if(p->next->coef==0.0)
    {   q=p->next;
        p->next=q->next;
        free(q);
    }
    p=p->next;
}
printf("多项式A和多项式B的乘积为: \n");

p=pc;
count=0;
while(p->next)
{   printf("(%5.1f,%2d)",p->next->coef,p->next->exp);
    if(++count%6==0)
        printf("\n");
    p=p->next;
}
printf("\n");
}

```

习题9

四、程序设计题

11.11 090401.cpp

```

#include<stdio.h>
#include<stdlib.h>
void main()
{   struct person{
        char name[20];
        char sex;
        int age;
        float height;
    }person1;
    FILE *fp;

```



```

char fname[20];
int i;
printf("please input a file name:\n");
scanf("%s",fname);
if((fp=fopen(fname,"wb"))==NULL)
{   printf("cannot open this file!\n");
    exit(1);
}
printf("please input three persons' name,sex,age and height:\n");
for(i=0;i<3;i++)
{
scanf("%s%c%d%f",&person1.name,&person1.sex,&person1.age,&person1.height);
    if(fwrite(&person1,sizeof(person1),1,fp)!=1)
    {   printf("write error!\n");
        exit(2);
    }
}
fclose(fp);
if((fp=fopen(fname,"rb"))==NULL)
{   printf("cannot open this file!\n");
    exit(3);
}
printf("\nthe content of the file is:\nName\t\tSex\tAge\tHeight\n");
while(!feof(fp))
{   if(fread(&person1,sizeof(person1),1,fp)==1)
        printf("%-16s%-8c%-8d%-10.2f\n",person1.name,person1.sex,
            person1.age,person1.height);
}
fclose(fp);
exit(0);
}

```

11/11 090402.cpp

```

#include<stdio.h>
#include<math.h>
#include<stdlib.h>
void main()
{   int i;
    FILE *fp;
    if((fp=fopen("result.txt","w"))==NULL)
    {   puts("OPen file failed!");
        exit(1);
    }
    double result=0.0;

```

```

    for(i=0;i<=32;i++)
    {
        result=cos((double)(i*2)/32);
        printf("%lf\n",result);
        fprintf(fp,"%9.6f",result);
    }
    fclose(fp);
}

```

~~Let~~ 090403.cpp

```

#include<stdio.h>
#include<stdlib.h>
void main()
{
    FILE *fp;
    int i,j,n,ni;
    char c[160],t,ch;
    if((fp=fopen("file1","r"))==NULL)
    {
        printf("file 1 cannot be opened\n");
        exit(1);
    }
    printf("\n A contents are :\n");
    for(i=0;(ch=fgetc(fp))!=EOF;i++)
    {
        c[i]=ch;
        putchar(c[i]);
    }
    fclose(fp);
    ni=i;
    if((fp=fopen("file2","r"))==NULL)
    {
        printf("file 2 cannot be opened\n");
        exit(2);
    }
    printf("\n B contents are :\n");
    for(;(ch=fgetc(fp))!=EOF;i++)
    {
        c[i]=ch;
        putchar(c[i]);
    }
    fclose(fp);
    n=i;
    for(i=0;i<n;i++)
        for(j=i+1;j<n;j++)
            if(c[i]>c[j])
            {
                t=c[i];c[i]=c[j];c[j]=t;
            }
    if((fp=fopen("file3","w"))==NULL)
    {
        printf("file 3 cannot be opened\n");
    }
}

```

```

        exit(3);
    }
    for(i=0;i<n;i++)
    {   putc(c[i],fp);
        putchar(c[i]);
    }
    fclose(fp);
    exit(0);
}

```

//xt 090404.cpp

```

#include<stdio.h>
#include<stdlib.h>
#include<string.h>
void main()
{   FILE *fp;
    char str[100];
    int i=0;
    if((fp=fopen("test","w"))==NULL)
    {   printf("cannot open the file\n");
        exit(1);
    }
    printf("please input a string:\n");
    gets(str);
    while(str[i]!='\0')
    {   if(str[i]>='a'&&str[i]<='z')
        str[i]=str[i]-32;
        fputc(str[i],fp);
        i++;
    }
    fclose(fp);
    fp=fopen("test","r");
    fgets(str,strlen(str)+1,fp);
    printf("%s\n",str);
    fclose(fp);
}

```

//xt 090405.cpp

```

#include<stdio.h>
int main(int argc, char* argv[])
{   char filename[20];
    FILE *fpt;
    printf("Input filename:\n");
    gets(filename);
}

```

```

    if((fpt=fopen(filename,"w"))==NULL)
    {   printf("Can not Open File!");
        return 1;
    }
    char ch;
    ch=getchar();
    while(ch!='#')
    {   fputc(ch,fpt);
        ch=getchar();
    }
    return 0;
}

```

11st 090406.cpp

```

#include<stdio.h>
char Line[2000];
void clearLine()
{
    Line[0]='\0';
}
int getMaxLineNum(char filename[20])
{   int LineMax=0,Count=0,LineNum=0,LenMaxLine=0;
    char ch;
    FILE *fpt;
    if((fpt=fopen(filename,"r"))==NULL)
    {   printf("Can not Open File!");
        return 1;
    }
    ch=fgetc(fpt);
    while(ch!=EOF)
    {   putchar(ch);
        if(ch==10)
        {   if(LineMax<Count)
            {   LineMax=Count;
                LenMaxLine=LineNum;
            }
            Count=0;
            LineNum++;
        }
        else
            Count++;
        ch=fgetc(fpt);
    }
    fclose(fpt);
}

```

```

        return LenMaxLine;
    }
int printline(char filename[],int line)
{
    int LineNum=0;
    char ch;
    FILE *fpt;
    if((fpt=fopen(filename,"r"))==NULL)
    {
        printf("Can not Open File!");
        return 1;
    }
    ch=fgetc(fpt);
    while(ch!=EOF)
    {
        if(LineNum<line)
        {
            ch=fgetc(fpt);
            if(ch==10)
                LineNum++;
        }
        if(LineNum==line)
        {
            ch=fgetc(fpt);
            putchar(ch);
            if(ch==10)
                break;
        }
    }
    fclose(fpt);
    return 0;
}
int main(int argc, char* argv[])
{
    char filename[200];
    printf("Input filename:\n");
    gets(filename);
    int linenum=0;
    linenum=getMaxLineNum(filename);
    printf("LineNum %d\n",linenum);
    printline(filename,linenum);
    return 0;
}

```

~~11st~~ 090407.cpp

```

#include <stdio.h>
struct Student
{
    char name[20];
    char phone[20];
}

```

```

        int score;
    };
    struct Student inputStudent()
    {
        struct Student Stu;
        printf("Name:\n");
        gets(Stu.name);
        printf("Phone:\n");
        gets(Stu.phone);
        printf("Score:\n");
        scanf("%d",&Stu.score);
        getchar();
        return Stu;
    }
    int writeStus(struct Student Stus[],int num)
    {
        char filename[]="class.txt";
        FILE *fpt;
        if((fpt=fopen(filename,"w"))==NULL)
        {
            printf("Can not Open File!");
            return 1;
        }
        fwrite(Stus,sizeof(struct Student),num,fpt);
        fclose(fpt);
        return 0;
    }
    void write()
    {
        struct Student Stus[5];
        for(int i=0;i<5;i++)
        {
            printf("Input Infomation of the %dth Student:\n",i);
            Stus[i]=inputStudent();
        }
        writeStus(Stus,5);
    }
    void main(int argc, char* argv[])
    {
        write();
    }

```

//xt 090408.cpp

```

#include<stdio.h>
struct Student
{
    char name[20];
    char phone[20];
    int score;
};

```

```

void outputStudent(struct Student Stu)
{   printf("Name:%s\n",Stu.name);
    printf("Phone:%s\n",Stu.phone);
    printf("Score:%5d\n",Stu.score);
}
int  readStudent(struct Student *stu,int num)
{   char filename[]="class.txt";
    FILE *fpt;
    if((fpt=fopen(filename,"r"))==NULL)
    {   printf("Can not Open File!");
        return 1;
    }
    fseek(fpt,sizeof(struct Student)*num,SEEK_SET);
    fread(stu,sizeof(struct Student),1,fpt);
    fclose(fpt);
    return 0;
}
void read()
{   struct Student Stu;
    readStudent(&Stu,2);
    outputStudent(Stu);
}
void main(int argc, char* argv[])
{
    read();
}

```

11st 090409.cpp

```

#include<stdio.h>
#include<string.h>
struct Student
{   char name[20];
    char phone[20];
    int score;
};
int readStudentArr(struct Student Stus[],int num)
{   char filename[]="class.txt";
    FILE *fpt;
    if((fpt=fopen(filename,"r"))==NULL)
    {   printf("Can not Open File!");
        return 1;
    }
    fread(Stus,sizeof(struct Student),num,fpt);
    fclose(fpt);
}

```

```

        return 0;
    }
int writeStudentArr(struct Student Stus[],int num)
{
    char filename[]="class.txt";
    FILE *fpt;
    if((fpt=fopen(filename,"w"))==NULL)
    {
        printf("Can not Open File!");
        return 1;
    }
    fwrite(Stus,sizeof(struct Student),num,fpt);
    fclose(fpt);
    return 0;
}
int SwapSudent(struct Student *StuOne,struct Student *StuTwo)
{
    struct Student StuTemp;
    StuTemp=*StuOne;
    *StuOne=*StuTwo;
    *StuTwo=StuTemp;
    return 0;
}
void bubble(struct Student Stus[],int num)
{
    for(int i=0;i<num;i++)
        for(int j=0;j<num-i-1;j++)
            if(strcmp(Stus[j].name,Stus[j+1].name)>0)
                SwapSudent(&Stus[j],&Stus[j+1]);
}
void showdata(struct Student Stus[],int num)
{
    printf("Name\t Phone\t Score\t\n");
    for(int i=0;i<num;i++)
        printf("%s %s %8d \n",Stus[i].name,Stus[i].phone,Stus[i].score);
}
void restoreStudentArr()
{
    struct Student Stus[5];
    readStudentArr(Stus,5);
    bubble(Stus,5);
    showdata(Stus,5);
    writeStudentArr(Stus,5);
}
int main(int argc, char* argv[])
{
    restoreStudentArr();
    return 0;
}

```

11/11 090410.cpp


```

#include<stdio.h>
#include<string.h>
struct Student
{
    char name[20];
    char phone[20];
    int score;
};
int readStudentArr(struct Student Stus[],int num)
{
    char filename[]="class.txt";
    FILE *fpt;
    if((fpt=fopen(filename,"r"))==NULL)
    {
        printf("Can not Open File!");
        return 1;
    }
    fread(Stus,sizeof(struct Student),num,fpt);
    fclose(fpt);
    return 0;
}
int writeStudentArr(struct Student Stus[],int num)
{
    char filename[]="class.txt";
    FILE *fpt;
    if((fpt=fopen(filename,"w"))==NULL)
    {
        printf("Can not Open File!");
        return 1;
    }
    fwrite(Stus,sizeof(struct Student),num,fpt);
    fclose(fpt);
    return 0;
}
int SwapSudent(struct Student *StuOne,struct Student *StuTwo)
{
    struct Student StuTemp;
    StuTemp=*StuOne;
    *StuOne=*StuTwo;
    *StuTwo=StuTemp;
    return 0;
}
void bubble(struct Student Stus[],int num)
{
    for(int i=0;i<num;i++)
        for(int j=0;j<num-i-1;j++)
            if(strcmp(Stus[j].name,Stus[j+1].name)>0)
                SwapSudent(&Stus[j],&Stus[j+1]);
}
struct Student inputStudent()
{
    struct Student tempstu;

```

```

    puts("Name:");
    gets(tempstu.name);
    puts("Phone:");
    gets(tempstu.phone);
    puts("Score:");
    scanf("%d",&tempstu.score);
    return tempstu;
}
void showdata(struct Student Stus[],int num)
{
    printf("Name\t Phone\t Score\t\n");
    for(int i=0;i<num;i++)
        printf("%s %s %8d \n",Stus[i].name,Stus[i].phone,Stus[i].score);
}
void insertStudent()
{
    struct Student Stus[6];
    Stus[5]=inputStudent();
    readStudentArr(Stus,5);
    bubble(Stus,6);
    showdata(Stus,6);
    writeStudentArr(Stus,6);
}
int main(int argc, char* argv[])
{
    insertStudent();
    return 0;
}

```

习题 10

四、程序设计题

~~11xt~~ 100401.cpp

```

#include <stdio.h>
void main()
{
    void displayBits(unsigned num);
    unsigned a;
    printf("please a number of HEX:");
    scanf("%x",&a);
    displayBits(a);
}
void displayBits(unsigned num)
{
    int mask, i;
    mask = 1<<15;
    for(i=1; i<=16; i++)

```

```

        {   putchar(num&mask ? '1' : '0');
            num <<= 1;
            if( i%4==0 )
                putchar(',');
        }
        printf("B\n");
    }
}

```

//xt 100402.cpp

```

#include <stdio.h>
void main()
{   void displayBits(unsigned num);
    unsigned a;
    printf("please a number of HEX:");
    scanf("%x",&a);
    displayBits(a);
    a>>=4;
    displayBits(a);
}
void displayBits(unsigned num)
{   int mask, i;
    mask = 1<<15;
    for(i=1; i<=16; i++)
    {   putchar(num&mask ? '1' : '0');
        num <<= 1;
        if( i%4==0 )
            putchar(',');
    }
    printf("B\n");
}

```

//xt 100403.cpp

```

#include <stdio.h>
void main()
{   void displayBits(unsigned num);
    unsigned power2(int number,int pow);
    unsigned a,pow;
    printf("please a number of DEC:");
    scanf("%d",&a);
    printf("input left move bits:<16:");
    scanf("%d",&pow);
    displayBits(a);
    displayBits(power2(a,pow));
    printf("\n %d",power2(a,pow));
}

```

```

}
unsigned power2(int number,int pow)
{
    return number<<pow;
}
void displayBits(unsigned num)
{
    int mask, i;
    mask = 1<<15;
    for(i=1; i<=16; i++)
    {
        putchar(num&mask ? '1' : '0');
        num <<= 1;
        if( i%4==0 )
            putchar(',');
    }
    printf("B\n");
}

```

~~100404~~ 100404.cpp

```

#include <stdio.h>
void main()
{
    void displayBits(unsigned num);
    unsigned packCharacters(char c1,char c2);
    unsigned a;
    char c1,c2;
    printf("please two characters:");
    scanf("%c%c",&c1,&c2);
    a=packCharacters(c1,c2);
    printf("\nresult : %c  %c  %x\n",c1,c2,a);
    displayBits(a);
}
unsigned packCharacters(char c1,char c2)
{
    unsigned a=c1;
    a<<=8;
    a|=c2;
    return a;
}
void displayBits(unsigned num)
{
    int mask, i;
    mask = 1<<15;
    for(i=1; i<=16; i++)
    {
        putchar(num&mask ? '1' : '0');
        num <<= 1;
        if( i%4==0 )
            putchar(',');
    }
}

```

```

    }
    printf("B\n");
}

```

~~100405~~ 100405.cpp

```

#include <stdio.h>
void displayBits(unsigned num);
void main()
{
    void unpackCharacters(unsigned num);
    unsigned a;
    scanf("%d",&a);
    unpackCharacters(a);
}
void unpackCharacters(unsigned num)
{
    unsigned a;char c1,c2;
    a=num&0xFF00;
    c1=a>>8;
    c2=num&0x00FF;
    displayBits(num);
    printf("\nc1=%x,c2=%x",c1,c2);
    printf("\nc1=%c,c2=%c",c1,c2);
}
void displayBits(unsigned num)
{
    int mask, i;
    mask = 1<<15;
    for(i=1; i<=16; i++)
    {
        putchar(num&mask ? '1' : '0');
        num <<= 1;
        if( i%4==0 )
            putchar(',');
    }
    printf("B\n");
}

```

~~100406~~ 100406.cpp

```

#include <stdio.h>
char *encrypt(char *word,char code);
void main()
{
    char *p,s[]="lost control of the skidding car.";
    p=encrypt(s,'G');
    printf("\nencrypt string=%s",p);
    p=encrypt(s,'G');
    printf("\nunencrypt string=%s",p);
}

```

```

char *encrypt(char *word,char code)
{
    char *p=word;
    while(*word)
    {
        *word^=code;
        word++;
    }
    return p;
}

```

//xt 100407.cpp

```

#include <stdio.h>
void main()
{
    void displayBit(unsigned num);
    unsigned getbits(unsigned value,int n1,int n2);
    unsigned a,n1,n2;
    printf("please a number of HEX:");
    scanf("%x",&a);
    printf("\n and input n1,n2(start is 0)?");
    scanf("%d%d",&n1,&n2);
    printf("(a)from n1 to n2=%x\n ",getbits(a,n1,n2));
    displayBit(a);
    displayBit(getbits(a,n1,n2));
}
unsigned getbits(unsigned value,int n1,int n2)
{
    unsigned i;
    i=~0;
    i=(i>>n1)&(i<<(15-n2));
    i=value&i;
    i=i>>(15-n2);
    return i;
}
void displayBit(unsigned num)
{
    int mask, i;
    mask = 1<<15;
    for(i=1; i<=16; i++)
    {
        putchar(num&mask ? '1' : '0');
        num <<= 1;
        if( i%4==0 )
            putchar(',');
    }
    printf("B\n");
}

```

//xt 100408.cpp

```

#include <stdio.h>
void main()
{
    unsigned extracteOddBits(unsigned x);
    int n=123;
    n=extracteOddBits(n);
    printf("%d\n",n);
}
unsigned extracteOddBits(unsigned x)
{
    int i,j;
    unsigned z,a,q;
    z=0;
    for(i=1;i<=15;i+=2)
    {
        q=1;
        for(j=1;j<=(16-i-2)/2;j++)
            q=q*2;
        a=x>>(16-i);
        a=a<<15;
        a=a>>15;
        z=z+a*q;
    }
    return z;
}

```

11x1 100409.cpp

```

#include <stdio.h>
void main()
{
    unsigned unmutexCode (unsigned value);
    unsigned a;
    printf("please a number of HEX:");
    scanf("%x",&a);
    printf("Bcode(a)=%x ", unmutexCode (a));
}
unsigned unmutexCode (unsigned value)
{
    unsigned i;
    i=value&0x8000;
    if(i==0x8000)
        i=~value+1;
    else
        i=value;
    return i;
}

```