Experiment 3 The Simplest C Programming--Sequential Programming

1. Experimental Purpose

(1) Master one of the most frequently used sentences in C language--how to use assignment statements

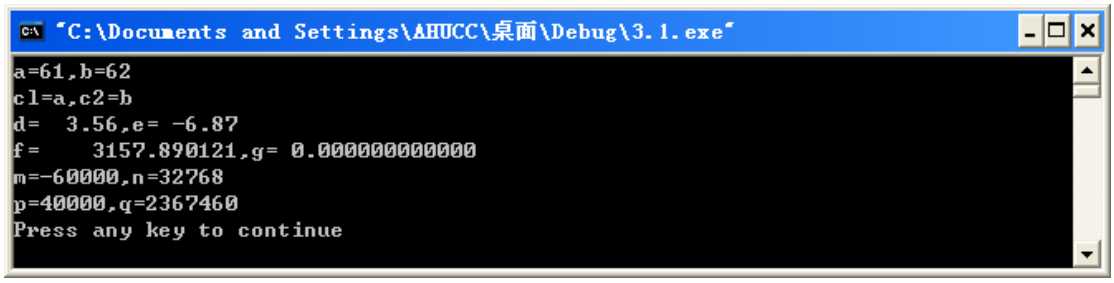
(2) Master the input and output methods of various types of data and use various format converters correctly.

(3) To further master the method of writing and debugging programs.

2. Experimental Contents and Steps

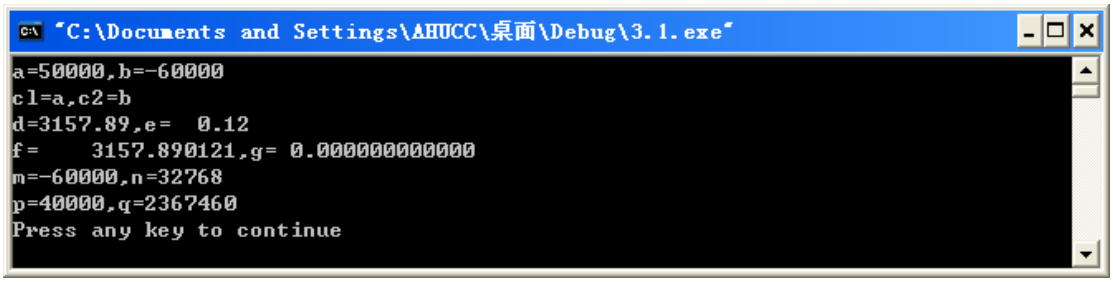
(1)

```
#include <stdio.h>
int main()
{
    int a,b;
    float d,e;
    char c1,c2;
    double f,g;
    long m,n;
    unsigned int p,q;
    a=61;b=62;
    c1='a';c2='b';
    d=3.56;e=-6.87;
    f=3157.890121;g=0.123456789;
    m=50000;n=-60000;
    p=32768;q=40000;
    printf("a=%d,b=%d\ncl=%c,c2=%c\nd=%6.2f,e=%6.2f\n",a,b,c1,c2,d,e);
    printf("f=%15.6f,g=%15.12f\nm=%ld,n=%ld\np=%u,q=%u\n",f,q,m,n,p,q);
    return 0;
}
```



On this basis, change lines 10-14 of the program to

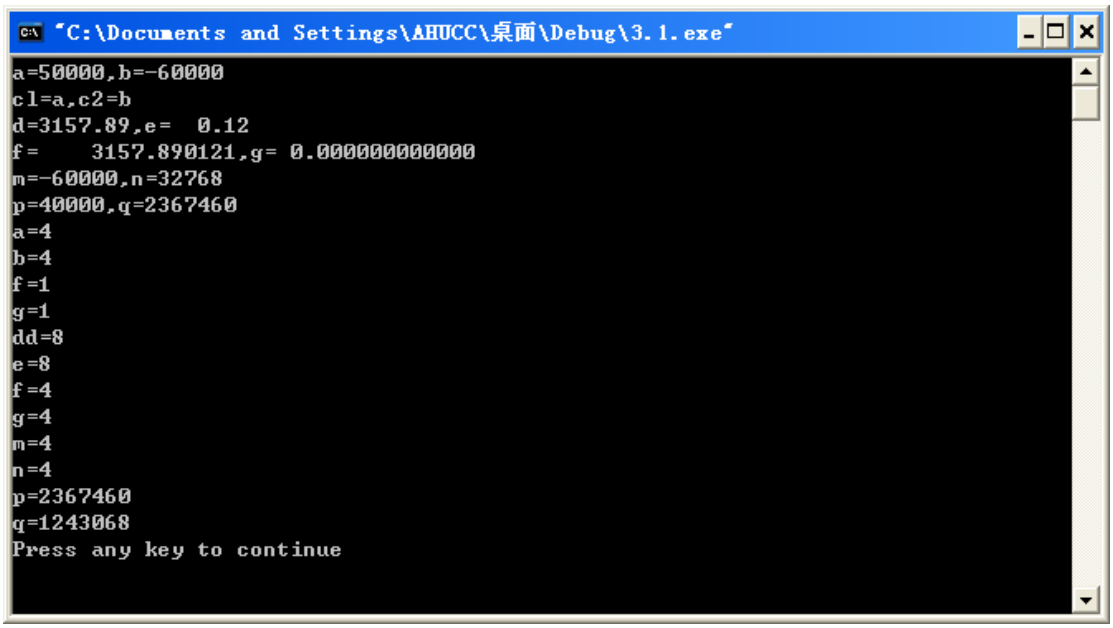
```
    c1=a;c2=b;
    f=3157.890121;g=0.123456789;
    d=f;e=g;
    p=a=m=50000;q=b=n=-60000;
    p=32768;q=40000;
```



Use the sizeof operator to detect how many bytes each type of data is in the program. For example, the number of bytes of an int variable a is sizeof (a) or sizeof (int), and the printf function statement outputs the length of each type of variable (number of bytes).

On the last line, add:

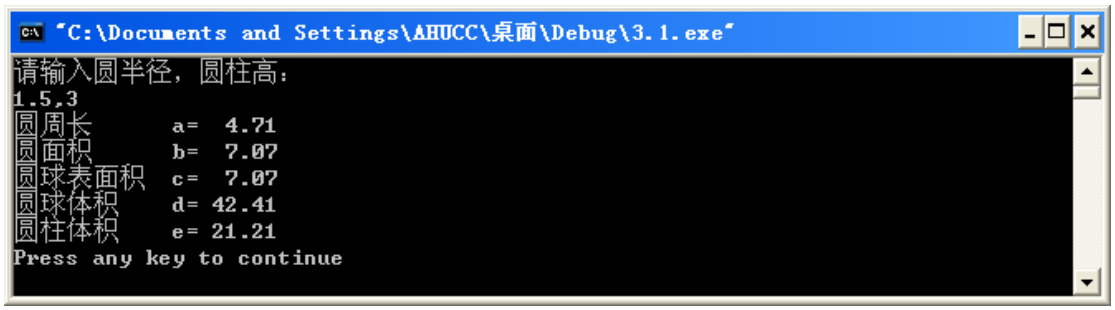
printf("a=%d\nb=%d\nf=%d\ng=%d\ndd=%d\ne=%d\nf=%d\ng=%d\nm=%d\nn=%d\np=%d\nq=%d\n",sizeof(a),sizeof(b),sizeof(c1),sizeof(c2),sizeof(f),sizeof(g),sizeof(m),sizeof(n),sizeof(p),sizeof(q));



2. Set the radius of the circle r=1.5 and the height of the cylinder h=3 to find the circumference, the area of the circle, the surface area of the circle, the volume of the circle and the volume of the cylinder. Programming program, scanf input data, output calculation results. The output is a caption with two digits after the decimal point (Chapter 3, Question 7).

```
#include <stdio.h>
int main()
{
    float r,h,a,b,c,d,e,pi;
    printf("Please enter the radius and height of the circle:");
    scanf("%f,%f",&r,&h);
    pi=3.141526;
    a=pi*r;
```

```
    b=pi*r*r;
    c=4/3*pi*r*r;
    d=4*pi*r*r*r;
    e=pi*r*r*h;
    printf("Circumference          a=%6.2f\n",a);
    printf("Circle Area          b=%6.2f\n",b);
    printf("Spherical surface area    c=%6.2f\n",c);
    printf("Spherical volume       d=%6.2f\n",d);
    printf("Cylindrical volume       e=%6.2f\n",e);
    return 0;
}
```



（3）Calculating Interest on Deposits (Chapter 3, Section 2)

There are 1,000 yuan. To save for 5 years, you can save it in the following five ways:

1. One deposit period of 5 years.

2. The principal and interest shall be deposited for another 3 years after the expiration of the existing 2-year period.

3. The principal and interest shall be deposited for a period of three years before maturity.

4. Save the principal and interest for one year after maturity and save them for five consecutive times.

5. Survival deposits. The current interest is settled quarterly.

Bank deposit rate 2017:

1.5% for a one-year period;

Periodic period of 2 years is 2.1%;

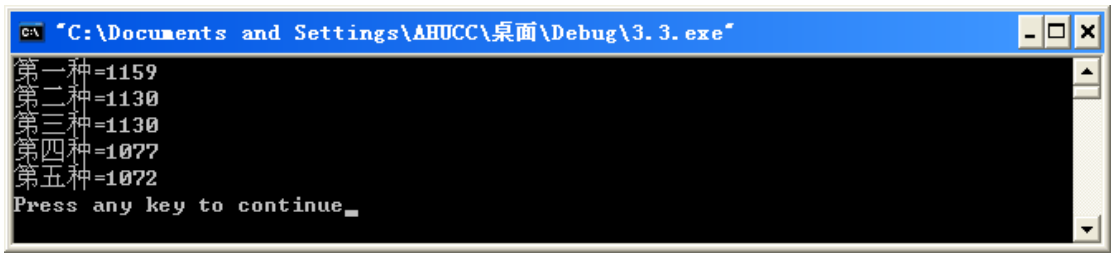
3-year period 2.75%;

Five-year period 3%;

The current period is 0.35%;

```
#include <stdio.h>
#include <math.h>
int main()
{
    int n,num,a1,a2,a3,a4,a5;
    float k1,k2,k3,k5,kh;
    n=1000;
    k1=0.015;k2=0.021;k3=0.0275;k5=0.03;kh=0.0035;
```

```
    a1=pow(1+k5,5)*n;
    a2=pow(k2+1,2)*pow(k3+1,3)*n;
    a3=pow(1+k3,3)*pow(1+k2,2)*n;
    a4=pow(1+k1,5)*n;
    a5=pow(1+kh,20)*n;
    printf ("first=%d\n second=%d\n third=%d\n fourth=%d\n fifth=%d\n", a1, a2, a3, a4, a5);
return 0;
}
```



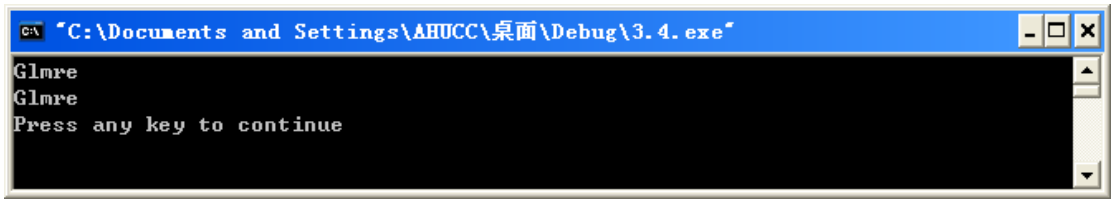
（4）The program has turned "China" into a password. The password rule is to replace the original letter with four non-letters after the original letter. For example, the fourth letter after'A'is'E', and'E' is used instead of'A'. Therefore, "China" should be translated as "Glmre". Make a program that uses the method of assigning initial values to make the values of c1, c2, c3, c4, C5 variables'C','h','i','n','a', and make c1, c2, c3, c4, C5 change to'G','l','m','r','e'. Output these five characters using the putchar function and the printf function respectively (Chapter 3, Chapter 6).

Method 1：

```
#include <stdio.h>
int main()
{
    char c1,c2,c3,c4,c5;
    c1='C';
    c2='h';
    c3='i';
    c4='n';
    c5='a';
    c1=c1+4;
    c2=c2+4;
    c3=c3+4;
    c4=c4+4;
    c5=c5+4;
    putchar(c1);putchar(c2);putchar(c3);putchar(c4);putchar(c5);
    printf("\n%c%c%c%c%c\n",c1,c2,c3,c4,c5);
    return 0;
}
```

Method 2：

```
#include <stdio.h>
int main()
{
    int i;
    char c[5];
    c[0]='C';
    c[1]='h';
    c[2]='i';
    c[3]='n';
    c[4]='a';
    for(i=0;i<5;i++)
        if((c[i]<='z'&&c[i]>='w')||(c[i]<='Z'&&c[i]>='W'))
            c[i]=c[i]-22;
        else c[i]=c[i]+4;
    for (i=0;i<5;i++)
        putchar(c[i]);
    printf("\n%c%c%c%c%c\n",c[0],c[1],c[2],c[3],c[4]);
    return 0;
}
```



Change the initial values of c1, c2, c3, c4, c5:'T','o','d','a','y', and a d d the following rules to the decoding rules:'W'replaces'A','X' replaces'B','Y'replaces'C','B' replaces'X','A'replaces'V'. Modify the program and run it.

```
#include <stdio.h>
int main()
{
    int i;
    char c[5];
    c[0]='T';
    c[1]='o';
    c[2]='d';
    c[3]='a';
    c[4]='y';
    for(i=0;i<5;i++)
        if((c[i]<='d'&&c[i]>='a')||(c[i]<='d'&&c[i]>='a'))
            c[i]=c[i]+22;
        else c[i]=c[i]-4;
    for (i=0;i<5;i++)
```

```
            putchar(c[i]);
        printf("\n%c%c%c%c%c\n",c[0],c[1],c[2],c[3],c[4]);
        return 0;
}
```