

## Experiment 4 Selection Structure Programming

### 1. Experimental Purpose

- (1) Understand how C stands for Roche's measurement (0 stands for false, non-0 stands for true).
- (2) Learn to use logical operators and expressions correctly.
- (3) Master the use of if statements (including the nesting of if statements).
- (4) Master the number of multi-branch selection statements - switch statements.
- (5) Master some simple algorithms in combination with the program.
- (6) Learn more about debugging methods.

### 2. Experimental Contents

- (1) There is a function:

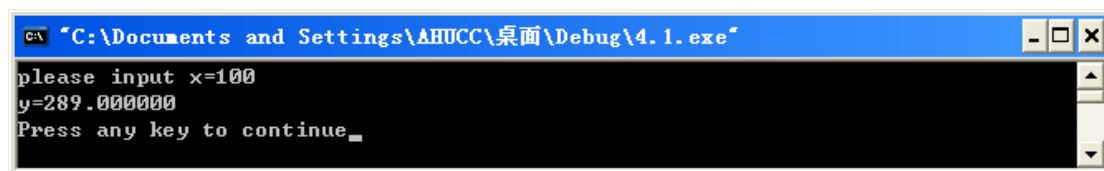
$X(x < 1)$

$Y = 2x - 1 \quad (1 \leq x < 10)$

$3x - 11 \quad (x \geq 10)$

Write a program, enter the value of  $x$ , output the corresponding value of  $Y$ .

```
#include <stdio.h>
int main()
{
    float x,y;
    printf("please input x=");
    scanf("%f",&x);
    if (x<1)
        y=x;
    else if (x<10 && x>=1)
        y=2*x-1;
    else y=3*x-11;
    printf("y=%f\n",y);
    return 0;
}
```



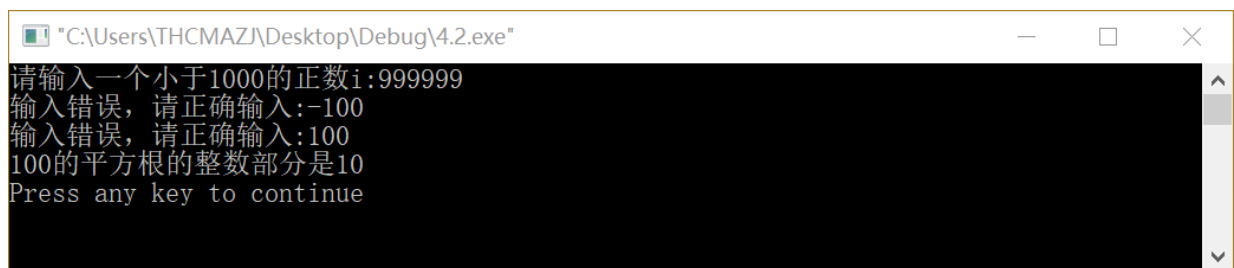
- (2) Enter a positive number less than 1000 from the keyboard, requiring the output of its square root (if the square root is not an integer, the output of its integer part). Input data is required to be checked for positive numbers less than 1000. If not, re-entry is required (Chapter 4, Title 5).

```
#include <stdio.h>
#include <math.h>
int main()
{
```

```

int i,k;
printf("Please enter a positive number i less than 1000:");
scanf("%d",&i);
while ((i<=0) || (i>=1000))
{
    printf("Input error, please enter correctly:");
    scanf("%d",&i);
    k=sqrt(i);
}
printf(" The integer part of %d the square root is%.0d\n",i,k);
return 0;
}

```



(3) Give a percentage result and ask for the output of grade A, B, C, D, E. Over 90 points are A, 81-89 points are B, 70-79 is divided into C, 60-69 into D and below 60 into E (Chapter 4, Question 8). And modify the program so that when the input data is greater than 100 and less than 0, the user is notified that the input data is wrong and the program ends.

```

#include <stdio.h>
int main()
{
    float score;
    char grade;
    printf("Please enter student results:");
    scanf("%f",&score);
    while (score>100 || score<0)
    {
        printf("\n Error in input, please retry");
        scanf("%f",&score);
    }
    switch((int)(score/10))
    {
        case 10:
        case 9:grade='A';break;
        case 8:grade='B';break;

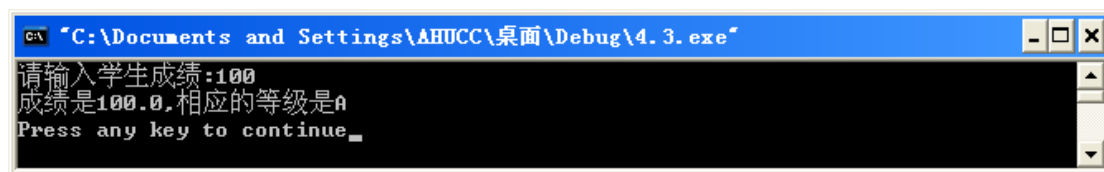
```

```

    case 7: grade='C'; break;
    case 6: grade='D'; break;
    case 5:
    case 4:
    case 3:
    case 2:
    case 1:
    case 0: grade='E';
}
printf("The score was%5.1f and the corresponding grade was%c\n", score, grade);
return 0;
}

```

结果截屏：



```

C:\Documents and Settings\AHUCC\桌面\Debug\4.3.exe
请输入学生成绩:100
成绩是100.0,相应的等级是A
Press any key to continue_

```

(4)

From small to large:

```

#include <stdio.h>
int main()
{
    int a[4], b, i, j;
    printf("Please enter 4 integers:\n");
    for (i=0; i<4; i++)
        scanf("%d", &a[i]);
    for (j=0; j<4; j++)
        for (i=0; i<4-j; i++)
            if (a[i] > a[i+1])
                {b=a[i]; a[i]=a[i+1]; a[i+1]=b;}
    printf("%d,%d,%d,%d\n", a[0], a[1], a[2], a[3]);
    return 0;
}

```



```

C:\Documents and Settings\AHUCC\桌面\Debug\4.4.exe
请输入4个整数:
211 985 100 1
1,100,211,985
Press any key to continue_

```