

Computer Prog. Fundamentals Lab 01

CPS 188

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Lab 1 Problem 1

Write a program that will figure out the largest and smallest number in a list.

Algorithm:

- 1) We will create the variables a, b, c, d, e, f, g and h to store our numbers
- 2) We will use float to declare the variables as using float allows us to work with decimal numbers.
- 3) Then we can use printf and scanf to give the option to choose our numbers.
- 4) After the numbers have been stored we can use if and else statements to figure out which number is the largest and which number is the smallest.
- 5) At the end we can use printf again to display our final answer.

Code:

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

```
int main() {
```

```
    //To store the numbers
```

```
    float a, b, c, d, e, f, g, h;
```

```
    printf("Choose first number, you will have to choose 8 numbers: ");
```

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

```
    printf("Choose second number: ");
```

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

```
    printf("Choose third number: ");
```

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

```
    printf("Choose forth number: ");
```

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

```
    printf("Choose fifth number: ");
```

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

```
    printf("Choose sixth number: ");
```

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

```
    printf("Choose seventh number: ");
```

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

```
    printf("Choose eighth number: ");
```

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

```
    //Will find out the largest number
```

```
    if (a>=b && a>=c && a>=d && a>=e && a>=f && a>=g && a>=h) {
```

```
        printf("The largest number is %.3f\n", a);
```

```
    } else if (b>=a && b>=c && b>=d && b>=e && b>=f && b>=g && b>=h) {
```

```
        printf("The largest number is %.3f\n", b);
```

```
    } else if (c>=a && c>=b && c>=d && c>=e && c>=f && c>=g && c>=h) {
```

```
        printf("The largest number is %.3f\n", c);
```

```
    } else if (d>=a && d>=b && d>=c && d>=e && d>=f && d>=g && d>=h) {
```

```

printf("The largest number is %.3f\n", d);
} else if (e>=a && e>=b && e>=c && e>=d && e>=f && e>=g && e>=h) {
printf("The largest number is %.3f\n", e);
} else if (f>=a && f>=b && f>=c && f>=d && f>=e && f>=g && f>=h) {
printf("The largest number is %.3f\n", f);
} else if (g>=a && g>=b && g>=c && g>=d && g>=e && g>=f && g>=h) {
printf("The largest number is %.3f\n", g);
} else if (e>=a && e>=b && e>=c && e>=d && e>=g && e>=f && e>=h) {
printf(" The largest number is %.3f\n", e);
}

//Will find out the smallest number
if (a<=b && a<=c && a<=d && a<=e && a<=f && a<=g && a<=h) {
printf("The smallest number is %.3f\n", a);
} else if (b<=a && b<=c && b<=d && b<=e && b<=f && b<=g && b<=h) {
printf("The smallest number is %.3f\n", b);
} else if (c<=a && c<=b && c<=d && c<=e && c<=f && c<=g && c<=h) {
printf("The smallest number is %.3f\n", c);
} else if (d<=a && d<=b && d<=c && d<=e && d<=f && d<=g && d<=h) {
printf("The smallest number is %.3f\n", d);
} else if (e<=a && e<=b && e<=c && e<=d && e<=f && e<=g && e<=h) {
printf("The smallest number is %.3f\n", e);
} else if (f<=a && f<=b && f<=c && f<=d && f<=e && f<=g && f<=h) {
printf("The smallest number is %.3f\n", f);
} else if (g<=a && g<=b && g<=c && g<=d && g<=e && g<=f && g<=h) {
printf("The smallest number is %.3f\n", g);
} else if (h<=a && h<=b && h<=c && h<=d && h<=e && h<=f && h<=g) {
printf("The smallest number is %.3f\n", h);
}

return 0;

}

```

Screenshot of the code:

```

1  #include <stdio.h>
2  int main() {
3      //To store the numbers
4      float a, b, c, d, e, f, g, h;
5      printf("Choose first number, you will have to choose 8 numbers: ");
6      scanf("%f", &a);
7      printf("Choose second number: ");
8      scanf("%f", &b);
9      printf("Choose third number: ");
10     scanf("%f", &c);
11     printf("Choose forth number: ");
12     scanf("%f", &d);
13     printf("Choose fifth number: ");
14     scanf("%f", &e);
15     printf("Choose sixth number: ");
16     scanf("%f", &f);
17     printf("Choose seventh number: ");
18     scanf("%f", &g);
19     printf("Choose eighth number: ");
20     scanf("%f", &h);
21     //Will find out the largest number
22     if (a>b && a>c && a>d && a>e && a>f && a>g && a>h) {
23         printf("The largest number is %.3f\n", a);
24     } else if (b>a && b>c && b>d && b>e && b>f && b>g && b>h) {
25         printf("The largest number is %.3f\n", b);
26     } else if (c>a && c>b && c>d && c>e && c>f && c>g && c>h) {
27         printf("The largest number is %.3f\n", c);
28     } else if (d>a && d>b && d>c && d>e && d>f && d>g && d>h) {
29         printf("The largest number is %.3f\n", d);
30     } else if (e>a && e>b && e>c && e>d && e>f && e>g && e>h) {
31         printf("The largest number is %.3f\n", e);
32     } else if (f>a && f>b && f>c && f>d && f>e && f>g && f>h) {
33         printf("The largest number is %.3f\n", f);
34     } else if (g>a && g>b && g>c && g>d && g>e && g>f && g>h) {
35         printf("The largest number is %.3f\n", g);
36     } else if (h>a && h>b && h>c && h>d && h>e && h>f && h>g) {
37         printf("The largest number is %.3f\n", h);
38     }
39     //Will find out the smallest number
40     if (a<b && a<c && a<d && a<e && a<f && a<g && a<h) {
41         printf("The smallest number is %.3f\n", a);
42     } else if (b<a && b<c && b<d && b<e && b<f && b<g && b<h) {
43         printf("The smallest number is %.3f\n", b);
44     } else if (c<a && c<b && c<d && c<e && c<f && c<g && c<h) {
45         printf("The smallest number is %.3f\n", c);
46     } else if (d<a && d<b && d<c && d<e && d<f && d<g && d<h) {
47         printf("The smallest number is %.3f\n", d);
48     } else if (e<a && e<b && e<c && e<d && e<f && e<g && e<h) {
49         printf("The smallest number is %.3f\n", e);
50     } else if (f<a && f<b && f<c && f<d && f<e && f<g && f<h) {
51         printf("The smallest number is %.3f\n", f);
52     } else if (g<a && g<b && g<c && g<d && g<e && g<f && g<h) {
53         printf("The smallest number is %.3f\n", g);
54     } else if (h<a && h<b && h<c && h<d && h<e && h<f && h<g) {
55         printf("The smallest number is %.3f\n", h);
56     }
57     return 0; }

```

Output:

Choose first number, you will have to choose 8 numbers: 2.7

Choose second number: 5.4

Choose third number: -13.2

Choose forth number: 22.22

Choose fifth number: 14.6

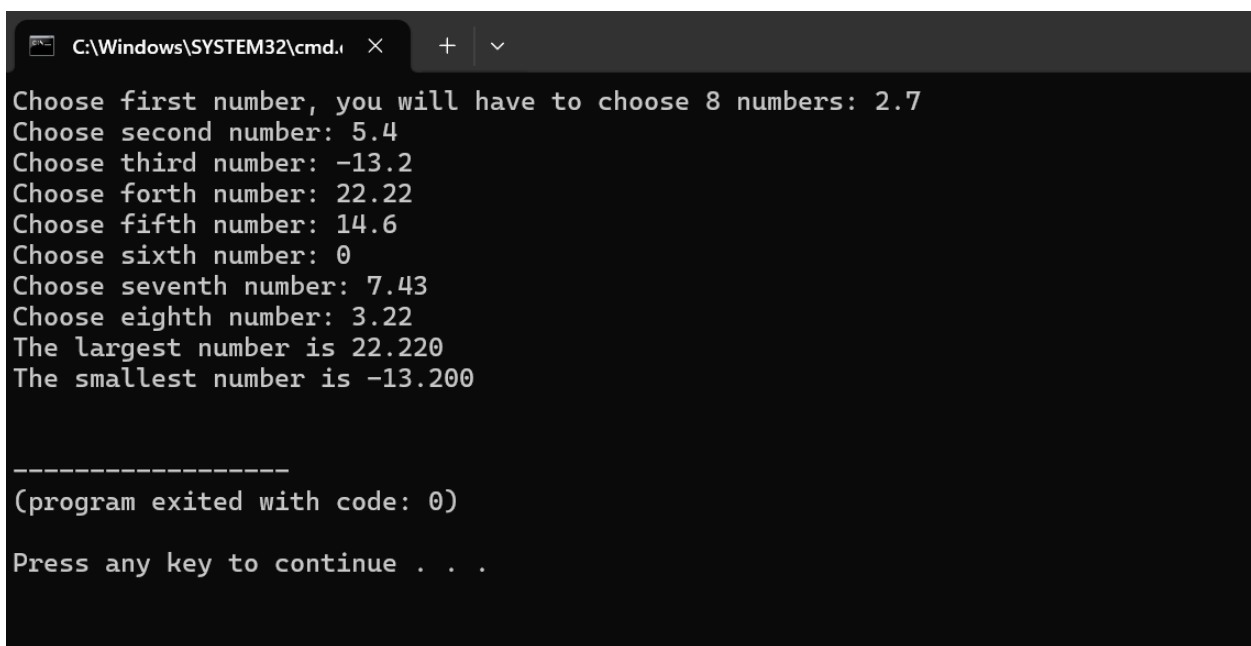
Choose sixth number: 0

Choose seventh number: 7.43

Choose eighth number: 3.22

The largest number is 22.220

The smallest number is -13.200



```
C:\Windows\SYSTEM32\cmd.exe
Choose first number, you will have to choose 8 numbers: 2.7
Choose second number: 5.4
Choose third number: -13.2
Choose forth number: 22.22
Choose fifth number: 14.6
Choose sixth number: 0
Choose seventh number: 7.43
Choose eighth number: 3.22
The largest number is 22.220
The smallest number is -13.200

-----
(program exited with code: 0)
Press any key to continue . . .
```

Lab 1 Problem 2

Write a program that will find the hypotenuse of a right triangle.

Algorithm:

-Ask the user to type in a value for “a” and the value for “b”, using printf and scanf and storing the number in the float variable.

-Use sqrt() to find the square root of a^2+b^2 which will give us the hypotenuse and have it displayed using printf.

Code:

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

int main ()
{
    //Introduction Statement
    printf("Let's find the hypotenuse, perimeter and area of a right triangle!\n");

    //Store the value in a and b
    float a;
    float b;

    //For you to choose your side length
    printf("write in the value for a: \n");
    scanf("%f", &a);
    printf("write in the value for b: \n");
    scanf("%f", &b);

    //Formula to find the hypotenuse, surface area and perimeter of a right triangle
    float c=sqrt(a*a+b*b);
    float p=a+b+c;
    float s=0.5*a*b;

    //Final statement
    printf("the hypotenuse of a triangle with a side of %.2f and %.2f is %.2f\n",a , b, c);
    printf("the perimeter of the triangle is %.2f\n", p);
    printf("the area of the triangle is %.2f", s);

    return 0;
}
```

Screenshot of the Code:

```

1  #include <stdio.h>
2  #include <math.h>
3
4  int main ()
5  {
6      //Introduction Statement
7      printf("Lets find the hypotenuse, perimeter and area of a right triangle!\n");
8
9      //Store the value in a and b
10     float a;
11     float b;
12
13     //For you to choose your side length
14     printf("write in the value for a: \n");
15     scanf("%f", &a);
16     printf("write in the value for b: \n");
17     scanf("%f", &b);
18
19     //Formula to find the hypotenuse, surface area and perimeter of a right triangle
20     float c=sqrt(a*a+b*b);
21     float p=a+b+c;
22     float s=0.5*a*b;
23
24     //Final statement
25     printf("the hypotenuse of a traingle with a side of %.2f and %.2f is %.2f \n",a , b, c);
26     printf("the perimeter of the triangle is %.2f \n", p);
27     printf("the area of the triangle is %.2f", s);
28
29     return 0;
30 }
31

```

Output:

Lets find the hypotenuse, perimeter and area of a right triangle!

write in the value for a:

5

write in the value for b:

5

the hypotenuse of a traingle with a side of 5.00 and 5.00 is 7.07

the perimeter of the triangle is 17.07

the area of the triangle is 12.50

```
C:\Windows\SYSTEM32\cmd.exe X + v
Lets find the hypotenuse, perimeter and area of a right triangle!
write in the value for a:
5
write in the value for b:
5
the hypotenuse of a traingle with a side of 5.00 and 5.00 is 7.07
the perimeter of the triangle is 17.07
the area of the triangle is 12.50

-----
(program exited with code: 0)
Press any key to continue . . .
```