Computer Prog. Fundamentals Lab 01

CPS 188
Mansur Hasan
501285994
Jan 24, 2025
Prof: Dr. Hamelin

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:

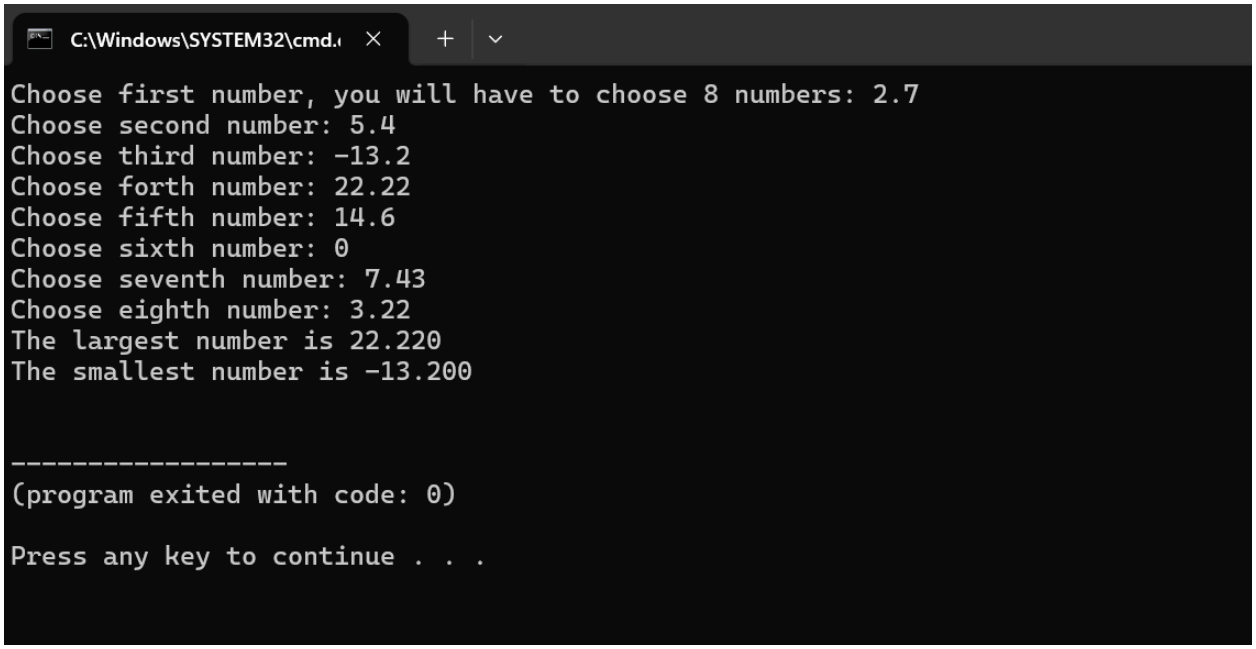
```
#include <stdio.h>

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:

```c
#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;   }
```

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



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*a+b*b which will give use our hypotenuse and have it displayed using printf.

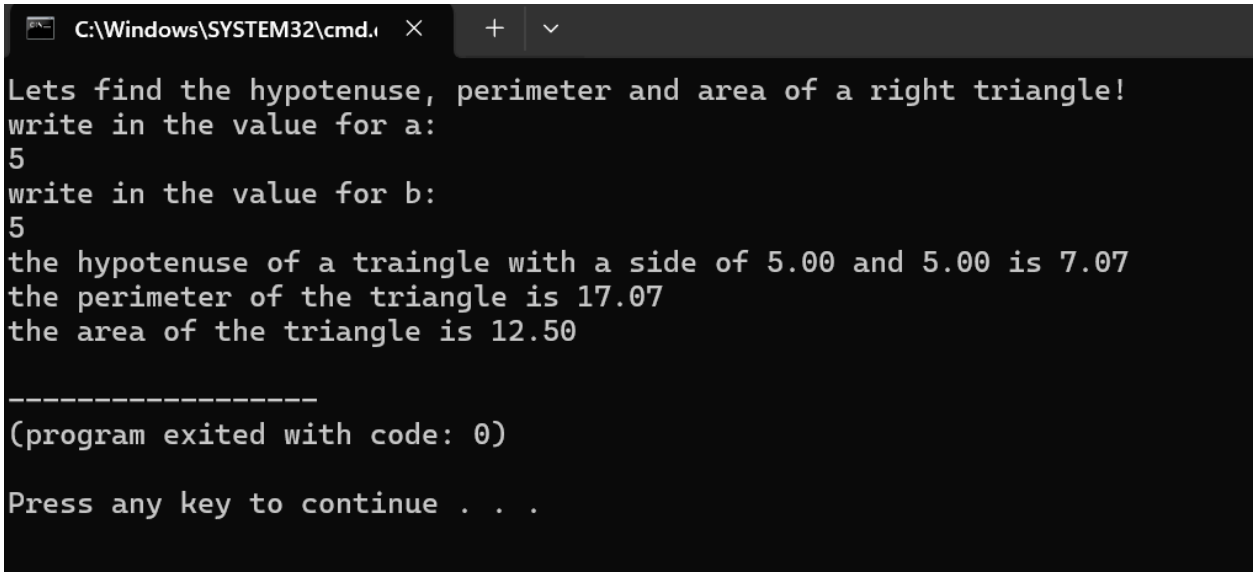
Code:

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

	int main ()
	{
		//Introduction Statement
		printf("Lets 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 traingle 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:

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

int main ()
    {
        //Introduction Statement
printf("Lets 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 traingle 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;
    }
```

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.
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 . . .