03603111: Programming Fundamentals I

	Function	Lab 7

Objective:

- Understand function definitions and calls
- Develop skill to discover structures in computational problems

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Example: Write a program that gets the width and height of a rectangle, and then create a function to calculate the area of the rectangle. Your code may look like the following:

```
#Define
float area_rec(float width,float height):
    return width*height;
int main(){
float w,h;
printf("Enter width:");
 scanf("%f",&w);
printf("Enter height:");
scanf("%f",&h);
print("The area of the rectangle =%.2f", area_rec(w,h))
}
```

The program may look like the following:

```
Enter width: 5
Enter height: 3.5
The area of rectangle = 17.5
```

Exercise 1. Write a function *bodyMassIndex(weight, height)* returns a body mass index calculated according to equation.

$$body\ mass\ index = \frac{weight(kg)}{height(m)^2}$$

The program may look like the following:

```
Enter weight (kg): 62
Enter height (m): 1.72
The BMI  = 20.95
```

Exercise 2. Write a function to compute the *perimeter* of a circle according to equation

$$perimeter = 2\pi r$$

```
Enter a radius of circle: 5
The perimeter of circle = 31.40
```

Exercise 3. Write a function to compute the *perimeter* of a circle according to equation

$$perimeter = initial\_investment * (1 + interest\_rate)^N$$

```
Enter an initial investment: 100
Enter an interest rate: 0.05
Enter a number of years: 5
The principal_year_N = 127.63
```

Exercise 4. Write a function to check if a given integer number if a prime number

```
Enter an integer number: 5

5 is a prime number.
```

```
Enter an integer number: 9

9 is not a prime number.
```

Exercise 5. Write a program to get 5 numbers from user and write a function to return the average of a list of numbers.

```
Enter an integer: 1
Enter an integer: 2
Enter an integer: 3
Enter an integer: 4
Enter an integer: 5

The average of [1,2,3,4,5] is 3.00
```

Exercise 6. Write a function, *printchars*(ch, n), to print the input character, ch, n times

```
Enter a character : x
Enter a number: 10

xxxxxxxxxx
```

Exercise 7. Write a function computing the factorial of a given input integer

```
Enter the number: 5

5! = 120
```

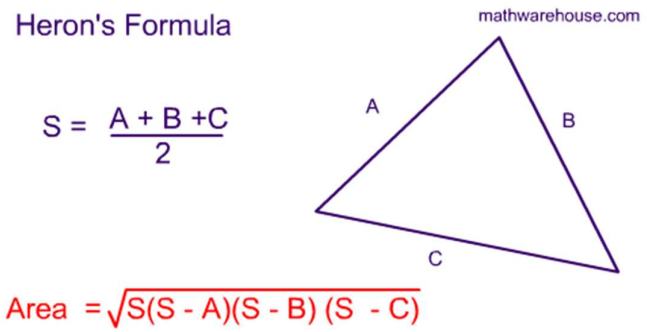
Exercise 8. Write a function *distance*(x_1, y_1, x_2, y_2) to compute the distance between two points (x_1,y_1) and (x_2,y_2)

$$distance = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$$

```
Enter x of point 1: 0
Enter y of point 1: 0
Enter x of point 2: 1
Enter y of point 2: 1

Distance between (0,0) and (1,1) =1.41
```

Exercise 9. Write a function areaT(x_1, y_1, x_2, y_2, x_3, y_3) to compute the area of a triangle with vertices (x_1,y_1), (x_2,y_2) and (x_3,y_3). (*Hint: first compute three edges then use Heron's formula*)




```
Enter point 1 (x1,y1)
x: 0
y: 0
Enter point 2 (x2,y2)
x: 1
y: 1
Enter point 3 (x3,y3)
x: 0
y: 1

The area of a triangle =0.50
```