LAB No .05

Task01

Write a C function `'int test_prime(int);'` that takes in a positive number as input and returns ***true*** (1) if the input number is prime or *false* (0) if the input is not prime. Then using this function, write a C program that takes a number (N) as input from the user and prints out the first N prime numbers.

Task 02

(a) Write a C program that asks user to input a value for θ in degrees .It should then calculate the value of the mathematical function **y** and print its value on screen. Write separate functions to implement $f_1(\theta)\ and\ f_2(\theta)$.

Hint: include the **'math.h'** library and use the following functions. Remember that these functions expect inputs to be in ***Radians***.

```
double sin(double x);
```

```
double cos(double x);
```

$$y = f_1(\theta) + f_2(\theta)$$

$$f_1(\theta) = \left(\cos\frac{\theta}{2}\right)^2$$

$$f_2(\theta) = -\left(\sin\frac{\theta}{2}\right)^2$$

(b) Modify the above program to calculate the value of y.

Hint: include the **'math.h'** library and use the following function:

```
double sqrt(double x);
```

$$y = f_1(\theta) + f_2(\theta) + f_3(\theta)$$

$$f_1(\theta) = \left(\cos\frac{\theta}{2}\right)^2$$

$$f_2(\theta) = 0.5\sqrt{\frac{1+\cos 2\theta}{2}}$$

$$f_3(\theta) = \frac{1}{2}$$

Post Lab

Write a C program that takes two floating type inputs from the user and calculates their average, individual factorials, and a function $f(x,y) = \sqrt{x^2+y^2}$. Use separate C functions to compute the average, factorial and the function 'f'. The program should print the results in the **main** function.