PF LAB #04
LAB TASK

1. Consider the definition of the function main.

```
int main()
{
        int x, y;
        char z;
        double rate, hours;
        double amount;
.
.
}
```

The variables x, y, z, rate, and hours referred to in items a through f below are the variables of the function main. Each of the functions described must have the appropriate parameters to access these variables. Write the following definitions:

a. Write the definition of the function initialize that initializes x and y to 0 and z to the blank character.
b. Write the definition of the function getHoursRate that prompts the user to input the hours worked and rate per hour to initialize the variables hours and rate of the function main
c. Write the definition of the value-returning function payCheck that calculates and returns the amount to be paid to an employee based on the hours worked and rate per hour. The hours worked and rate per hour are stored in the variables hours and rate, respectively, of the function main. The formula for calculating the amount to be paid is as follows: For the first 40 hours, the rate is the given rate; for hours over 40, the rate is 1.5 times the given rate.
d. Write the definition of the function printCheck that prints the hours worked, rate per hour, and the salary.
e. Write the definition of the function funcOne that prompts the user to input a number. The function then changes the value of x by assigning the value of the expression 2 times the (old) value of x plus the value of y minus the value entered by the user.
f. Write the definition of the function nextChar that sets the value of z to the next character stored in z.
g. Write the definition of a function main that tests each of these functions

2. Write a progam that reads a string and outputs the number of times each lowercase vowel appears in it. Your program must contain a function with one of its parameters as a string variable, and return the number of times each lowercase vowel appears in it. Also write a program to test your function. (Note that if str is a variable of type string, then str.at(i) returns the character at the ith

position. The position of the first character is 0. Also, str.length() returns the length of the str, that is, the number of characters in str.)

3. Write a value-returning function, isVowel, that returns the value true if a given character is a vowel and otherwise returns false.

4. Write a program that prompts the user to input a sequence of characters and outputs the number of vowels. (Use the function isVowel you defined in task 3)

5. Write a program that defines the named constant PI, const double PI = 3.1419 which stores the value of p. The program should use PI and the functions listed in Table below

    a. Output the value of $\sqrt{\Pi}$
    b. Prompt the user to input the value of a double variable r, which stores the radius of a sphere. The program then outputs the following
        i. The value of 4 πr^2, which is the surface area of the sphere.
        ii. The value of (4/3) πr^3, which is the volume of the sphere.