National University of Sciences and Technology (NUST), Balochistan Campus (NBC).

Assignment, Lab9

Department:
Computer Science

Course Title:
Fundamental of FOP (LAB)

Course Code:
CS-110

ASSIGNMENT TOPICS:

✓**Four tasks given below.**

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Student sign

Instructor sign

Task #1

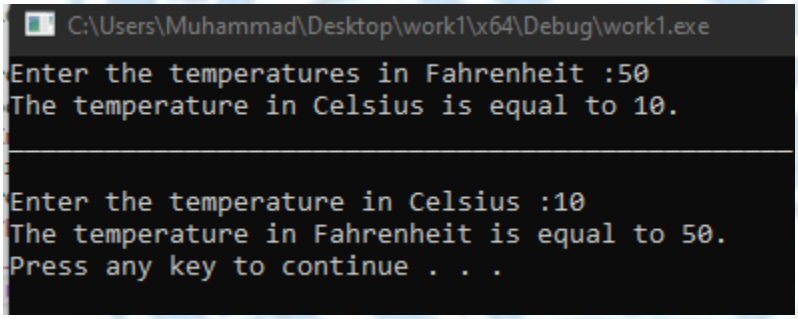
Temperature Conversion
Implement the following functions
a) Function Celsius returns the Celsius equivalent of a Fahrenheit temperature
b) Functions Fahrenheit returns the Fahrenheit equivalent of a Celsius temperature.

CODE

```cpp
// Temperature Conversion

#include<iostream>      // Preprocessive directive to include input and output streams.
using namespace std;    // Defining the context in which names are defined.
float functionCelsius(float& temp);     // Funtion Prototype gives information to the compiler about the structure of it and it is needed when a function is defined after main function.
float functionsFahrenheit(float& temp);  // Funtion Prototype
// Main function, entry point.
int main() {
    float fahrenheit, celsius;   // Two variables of int data type, used to store the data of user when he enters them.
    float temperature;         // Defined a temperature variable of data type of float to store the returing value of the both user-defined fuctions. The functions are given in line#22 and 28.
    cout << "Enter the temperatures in Fahrenheit :"; // Asking the user to enter the temperature in fahrenheit and storing it in variable, fahrenheit, at the next line.
    cin >> fahrenheit;
    temperature = functionCelsius(fahrenheit); // Assigning temperature to the returning value of functionCelsius and passing fahrenheit arguement by reference.
    cout << "The temperature in Celsius is equal to " << temperature << ".\n"; // Displaying the final result.
    cout << "_____________________________________________\n"; // Used to indicate the 2nd part of the program.
    cout << "Enter the temperature in Celsius :";      // Asking the user to enter the temperature in Celsius and storing it in variable, celsius, at the next line.
    cin >> celsius;
    temperature = functionsFahrenheit(celsius);      // Calling the function and assigning temperature to the returning value of functionCelsius and passing celsius arguement by reference.
    cout << "The temperature in Fahrenheit is equal to " << temperature << ".\n"; // Displaying the final result.
    system("pause");   // Temporarily stops the operations when executed.
    return 0;    // Return integer value 0 to the main function.
}
// Function Celsius returns the Celsius equivalent of a Fahrenheit temperature and passing the value by adress.
float functionCelsius(float& temp) {
    float celsius = 5.0 / 9.0 * (temp - 32);   // Formula
    return celsius;   // returing celsius at calling point of the function.
}
// Functions Fahrenheit returns the Fahrenheit equivalent of a Celsius temperature and passing the value by adress.
float functionsFahrenheit(float& celsius) {
    float fahrenteit = (celsius * 9 / 5) + 32;  // Formula
    return fahrenteit;     // Returning celsius at the calling point of the functioin.
}
```

OUTPUT:



Task#2:

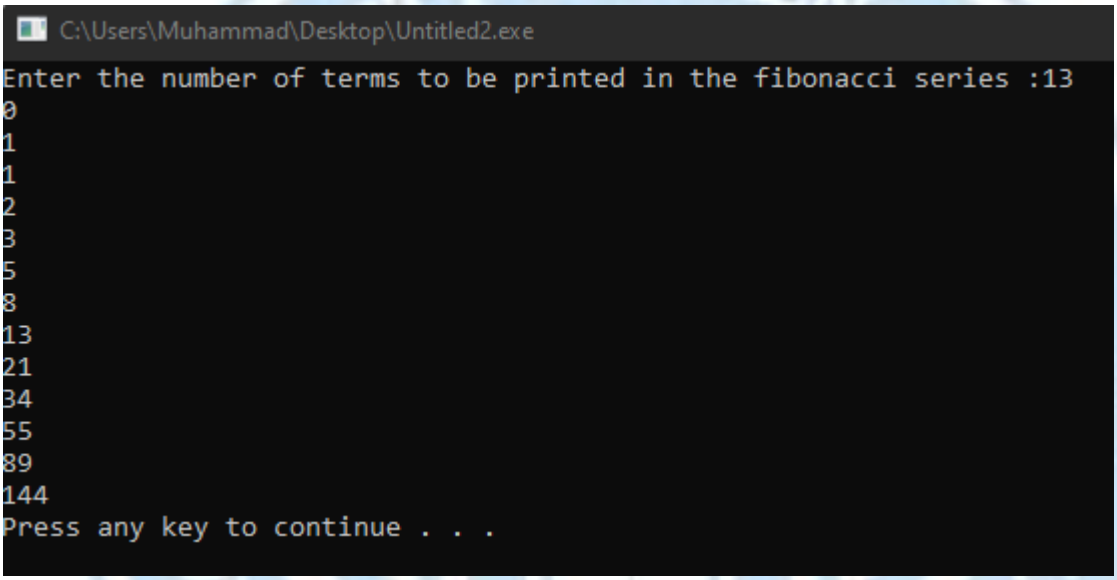
Write a function Fibonacci which calculates the Fibonacci number in series. For example
0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, …
Fibonacci (1) is 0

Fibonacci (8) is 13

CODING:

```cpp
#include<iostream>      // Preprocessive directive to include input and output streams.
using namespace std;    // Defining the context in which names are defined.
// A function Fibonacci which calculates the Fibonacci number in series
void fibonacci(int& num) {
    int firstValue = 0, secondValue = 1, next;
    for (int i = 0; i < num; i++) {
        cout << firstValue << endl;       // Displaying the first fibonacci number.
        next = firstValue + secondValue;  // Calculating the next number.
        firstValue = secondValue;         // Arraning them for the next.
        secondValue = next;               // Arraning them for the next.
    }
}
// Main function, entry point.
int main() {
    int terms; // Declared terms variable of data type of int
    cout << "Enter the number of terms to be printed in the fibonacci series :";  // Asking the user to enter how many fibonacci numbers he or she needs.
    cin >> terms;    // Storing the inputed value in num here.
    fibonacci(terms);  // Calling the function and passing num variable by adress.
    system("pause");   // Temporarily stops the operations when executed.
    return 0;    // Return integer value 0 to the main function.
}
```

OUTPUT:



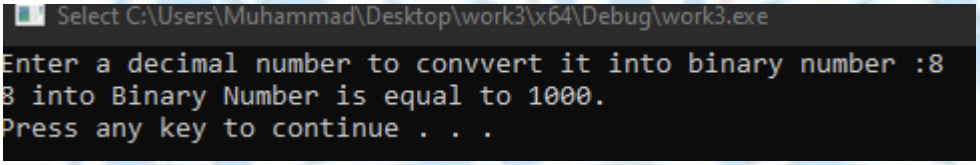
Task#3:

Write a program in C++ to convert decimal number to binary number using the function.

CODING:

```cpp
#include<iostream>
using namespace std;
// A function to convert decimal number to binary number.
int decimalNumberCalculation(int n) {
    int binary = 0, i = 1;
    if (n == 0) {
        cout << n << " ,itself is a binary number!";
    }
    else {
        while (n != 0) {
            binary = binary + (n % 2) * i;
            n = n / 2;
            i = i * 10;
        }
    }
    return binary;
    }
    int main() {
    int decimalNumber;
    cout << "Enter a decimal number to convvert it into binary number :";
    cin >> decimalNumber;
    cout << decimalNumber << " into Binary Number is equal to " << decimalNumberCalculation(decimalNumber) << ".\n";
    system("pause");
    return 0;
}
```

OUTPUT:



Task#4:

Write a program to find diameter, circumference and area of circle using functions.

CODING and OUTPUT :

```cpp
#include <iostream>
#include <math.h>
using namespace std;
// All Function declaration
double getDiameter(double radius);
double getCircumference(double radius);
double getArea(double radius);
int main() {
    float radius, diameter, circle, area;
    // Inputting radius of circle from user
    cout << "Enter radius of circle: ";
    cin >> radius;
    diameter = getDiameter(radius);        // Calling getDiameter function
    circle = getCircumference(radius);     // Calling getCircumference function
    area = getArea(radius);                // Calling getArea function
    cout << "Diameter of the circle: " << diameter << " units" << endl;
    cout << "Circumference of the circle: " << circle << " units" << endl;
    cout << "Area of the circle:" << area << " sq. units" << endl;
    system("pause");
    return 0;
}
// Calculating diameter of circle whose radius is given
double getDiameter(double radius) {
    return (2 * radius);
}
//Calculating circumference of circle whose radius is given
double getCircumference(double radius) {
    return (2 * 3.14 * radius); // PI = 3.14
}
//Finding area of circle whose radius is given
double getArea(double radius) {
    return (3.14 * radius * radius); // PI = 3.14
}
```