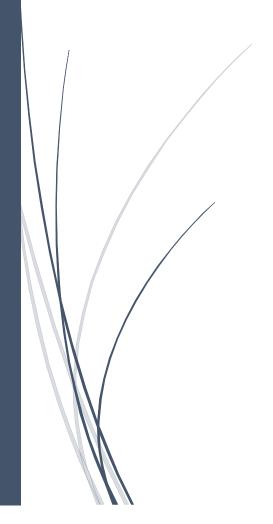4/19/2021

Programming Fundamentals

Lab Manual 8

Programming Fundamentals

LAB TOPIC: FOR Loop and While loop

A for loop is a repetition control structure which allows us to write a loop that is executed a specific number of times. The loop enables us to perform n number of steps together in one line.

Syntax:
```
for (initialization expr; test expr; update expr)

{

    // body of the loop

    // statements we want to execute

}
```

In for loop, a loop variable is used to control the loop. First initialize this loop variable to some value, then check whether this variable is less than or greater than counter value. If statement is true, then loop body is executed and loop variable gets updated. Steps are repeated till exit condition comes.

Example Program of FOR loop in C++

```
#include<iostream>
using namespace std;
int main()
{
    cout<<"We will print numbers from 1 to 20 using for loop"<<endl;
    for(int i=1;i<=20;i++)
    {
        cout<<"The number is:"<<i<<endl;
    }
    return 0;
}
```

Lab Tasks

1. Write a program that input series of temperature inputs from the user In Fahrenheit and convert them into Celsius until the user inputs a zero temperature value. Use for loop for the conversion of values into Celsius. Note the formula is

Celsius = (5.0/9.0) × (Fahrenheit - 32.0)

2. Write a program for a bank account that has initially $1000 in it and the owner earns interest every year at the rate of 4% of the original value. Calculate the total money in the account with interest until next 10 years with the increase of 4% every year. Note: Use for loop for every year increment. Also display the incremented amount in account for every year.

3. Write a program for a shopkeeper that has earnings of $2000 per month along with the expenditures. Calculate the earnings of the person for each month until a year(12 months) passes and it crosses $20000 and 10% of tax is also imposed on the person as this limit of 20000 is crossed. Also display the amount of tax calculated along with earnings of a year.

4. Write a program in C++ to display the cube of the number up to given an integer.

    Sample Output:

    Input the number of terms : 5

    Number is : 1 and the cube of 1 is: 1

    Number is : 2 and the cube of 2 is: 8

    Number is : 3 and the cube of 3 is: 27

    Number is : 4 and the cube of 4 is: 64

    Number is : 5 and the cube of 5 is: 125

5. Calculate the average score of each player using the chart given:

    1st player: 286 262 265

    2nd player: 212 152 215

    3rd bowler: 365 432 216

    4th bowler: 192 154 235

    Use for loop in input the score for each game.