

National University of Computer and Emerging Sciences



**Lab Manual # 04**

**Programming Fundamentals**

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## Instructions:

- Do your tasks individually
- Anyone indulged in the act of plagiarism would be awarded zero
- Pay attention to details, do paper work before starting your code
- Understanding of the question is also part of the lab work

## Objectives:

In this lab, students will study:

- Usage of Input/output statements
- Conditional Structures
  - If- selection statement
  - If-else statement
  - Nested if statement
- Control Structures
  - 'while' loop

## Input Output streams

**cin** and **cout** are two predefined objects which represent standard input and output stream. The standard output stream **cout** represents value on the screen, while the standard input stream **cin** represents the keyboard (read value enter by user). The header file of these stream is **<iostream>**.

Solve the following problems for better understanding of the topic.

### Task 0:

- a) (*cin usage*) How to read value from the user and store in a variable? By using cin stream object. Now, copy the given code and see what the following code prints.

```
#include <iostream>
using namespace std;

//main function starts here.
int main()
{
    int x;
    cout <<"Enter an integer value x = "<<endl;
    cin>>x;
    cout <<"Your number is = "<< x <<endl;
    return 0;
}
//main function ends here.
```

Output:

```
Enter an integer value x = 10
Your number is = 10
```

b) (*Shapes with Asterisks: cout usage*) What does the following code print?

```
#include<iostream>
using namespace std;
int main()
{
    //copy this code
    cout<<"*\n**\n***\n****\n*****\n";

    system("pause");
    return 0;
}
```

**Task 1:** Write a program that prompts the user to enter a number. Your task is to determine whether a number is positive or negative. If a number is positive, then check whether it is an even number or odd number, if the number is negative then simply print the message “Negative”.

```
#include<iostream>
using namespace std;
int main()
{
    Input number
    //check number is positive
    if(condition 1)
    {
        //check number is even or not
        if(condition 2)
        {
            //code
        }
        else
        {
            //code
        }
    }
    else
    {
        //code
    }
    system("pause");
    return 0;
}
```

Sample Output:  
Enter a number: 7  
It is positive odd number.

Enter a number: 96  
It is a positive even number

Enter a number: -8  
It is a negative number

**Task 2: (Nested-if)** Write a C++ program that takes four numbers from user as an input. Find the maximum from the given numbers using nested IF.

```
Sample Output:
```

```
Input: 21 7 11 34
```

```
Output: 34
```

**Task 3: (if else ladder)** Write a program that simulates a simple calculator. It reads two operands (int type) and an operator (character type). It performs the following arithmetic operations.

- $a + b$
- $a - b$
- $a * b$
- $a / b$
- $a \% b$

```
Sample Output:
```

```
Input:
```

```
Enter First Operand: 10
```

```
Enter Second Operand: 5
```

```
Enter operator: +
```

```
Output:
```

```
10 + 5 = 15
```

**Task 4:** A student buys various books at the start of the semester from a bookshop. Write C++ code for a program which takes the amount spent on each book and the total number of books as input and outputs the average cost per book.

**Task 5: (while loop)** Write a program that prints the numbers from 1 to 100. But for multiples of three print "Fizz" instead of the number and for the multiples of five print "Buzz". For numbers which are multiples of both three and five print "FizzBuzz".