National University
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LAB 05

Summary

Items	Description
Course Title	Programming Fundamentals
Lab Title	Operators in C++
Duration	3 Hours
Operating System/Tool/Language	Ubuntu/ g++/ C++
Objective	To get familiar Arithmetic and Logical operators in C++

1) Variables: Data Types, sizeOf and Polarity:

Example 1.1:

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

int main(){

        int age = 20;
        cout<<"Size of age (int) is : "<<sizeof(age)<<endl;
        float average = 2.2;
        cout<<"Size of average (float) is : "<<sizeof(average)<<endl;
        char alpha = 'a';
        cout<<"Size of alpha (char) is : "<<sizeof(alpha)<<endl;
        bool flag = 0;
        cout<<"Size of flag (bool) is : "<<sizeof(flag)<<endl;
}
```

```
kainat@kainat:~/Desktop/PF_Lab04$ g++ -o a.out task1.cpp
kainat@kainat:~/Desktop/PF_Lab04$ ./a.out

Size of age (int) is : 4

Size of average (float) is : 4

Size of alpha (char) is : 1

Size of flag (bool) is : 1
```

Example 1.2:

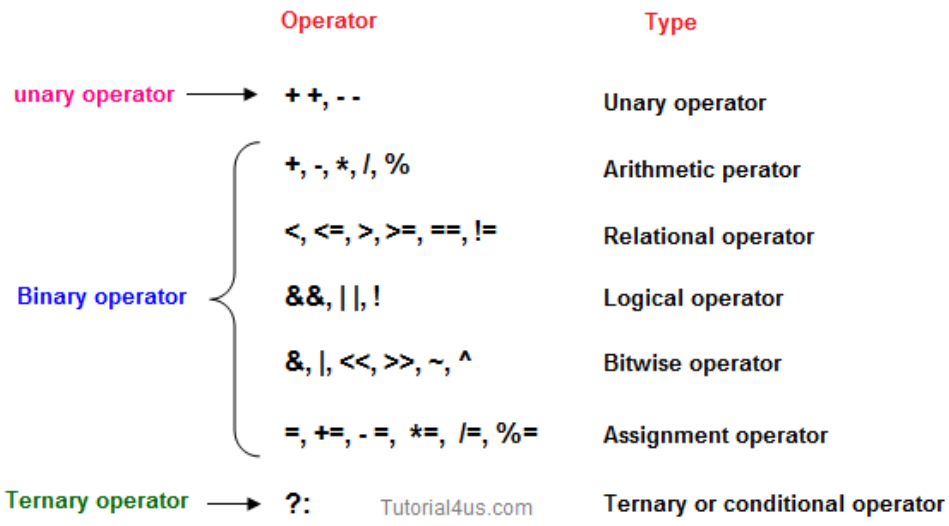
```
#include<iostream>
using namespace std;

int main(){
        unsigned int price = 100;
        cout<<"The value of price is : "<<price<<endl;
        signed int x = -10;
        cout<<"The value of x is : "<<x<<endl;
}
```

```
The value of price is : 100

The value of x is : -10
```

Operator Presedence



Sample#02

```
int a,b;
cout<<"please eneter vale of A"<<endl;
cin>>a;
cout<<"please enter value of B"<<endl;
cin>>b;
int c;
c=a+b;
int d,e;
d=a&&b;
e=a||b;
cout<<"sum of "<<a<<" and "<<b<<" = "<<c<<endl;
cout<<"   AND of "<<a<<" and "<<b<<" = "<<d;
cout<<"   OR of "<<a<<" and "<<b<<" = "<<e<<endl;
```

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LAB TASKS

Task 1

Run all sample programs and note down the output of each program

Task 2

Write a C++ program to print the following lines:

Narrated `Abdullah bin `Amr: A man asked the Prophet (PBUH), "What sort of deeds or (what qualities of) Islam are good?" The Prophet (PBUH) replied, 'To feed (the poor) and greet those whom you know and those whom you do not Know.'

Task 3

Create a program that solves the following mathematical equation:

$$\frac{-b + b^2 - 4ac}{2a}$$

Where a,b,c, will be entered by user, your program should calculate the result.

Task 4

Write a program that prints the truth table of OR Gate. Use relational and logical operators for the result of the truth table. In OR gate, the output will be 1 if at least 1 input is non-zero.

Sample Output:

A B X
0 0 0
0 1 1
1 0 1
1 1 1

Task 5

Write a program that asks a shopkeeper to input unit price of chocolate mini bar and stores in a variable. It then asks to input the quantity of chocolates sold in a particular day and store in another variable. Now it calculates and displays the total sales amount of chocolates earned by the shopkeeper. Now calculate 10% tax on total sales amount and store in another variable. Display the total sales amount of chocolates after tax deduction.

Task 6

If a five-digit number is input through the keyboard, write a program to calculate the sum of its digits.
(Hint: Use the modulus operator '%')
Sample output:
enter a 5 digit single number: 12423
Sum of all digits of the number is 12
NOTE : Your input is a single number not 5 different inputs

Task 7

Write a program for the following mathematical trick:

- Declare an integer variable
- Take input from user and assign the value to the variable
- Double the value of variable and store in the same variable.
- Add 10 to the value of variable and store in the same variable.
- Now half the value of variable and store in the same variable.
- Then subtract the number entered by user from the current value of the variable and store in the same variable.

Finally display the value of the variable. The answer must always be five.

Task 8

If a four - digit number is input through the keyboard, write a program to reverse the number.
Sample Output:
Enter a four digit number: 7412
Reverse of a number: 2147
NOTE : Your input is a single number not 4 different inputs

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Submission Instructions:

1. Save all .cpp files with your roll no and task number
   e.g. i21XXXX_Task01.cpp
2. Save all screenshots of terminal with your roll no and task number
3. Now create a new folder with name ROLLNO_LAB03 e.g. i21XXXX_LAB03
4. Move all your .cpp files to this newly created directory and compress it into .zip file.
5. Now you must submit this zipped file on Google Classroom.

OR
You can make a single file where you will be pasting all your solutions with screenshots.