LAB MANUAL 03

INPUT/OUTPUT

Lab Objectives:

At the end of this lab students will know about

- **How to take input**
- **How to make equations**
- **How to use different types of identifiers**
- **Compound Assignment**

C++ USER INPUT

You have already learned that `cout` is used to output (print) values. Now we will use `cin` to get user input.

`cin` is a predefined variable that reads data from the keyboard with the extraction operator (`>>`).

In the following example, the user can input a number, which is stored in the variable `x`. Then we print the value of `x`:

EXAMPLE

```
int x;
cout << "Type a number: "; // Type a number and press enter
cin >> x; // Get user input from the keyboard
cout << "Your number is: " << x; // Display the input value
```

STRING TYPES

The `string` type is used to store a sequence of characters (text). This is not a built-in type, but it behaves like one in its most basic usage. String values must be surrounded by double quotes:

EXAMPLE

```
string greeting = "Hello";
cout << greeting;
```

To use strings, you must include an additional header file in the source code, the `<string>` library:

EXAMPLE

```
// Include the string library
#include <string>

// Create a string variable
string greeting = "Hello";

// Output string value
cout << greeting;
```

BOOLEAN TYPES

A boolean data type is declared with the `bool` keyword and can only take the values `true` or `false`. When the value is returned, `true` = `1` and `false` = `0`.

EXAMPLE

```
bool isCodingFun = true;
bool isFishTasty = false;
cout << isCodingFun;  // Outputs 1 (true)
cout << isFishTasty;  // Outputs 0 (false)
```

ARITHMETIC OPERATORS

Arithmetic operators are used to perform common mathematical operations.

Operator	Name	Description	Example
+	Addition	Adds together two values	x + y
-	Subtraction	Subtracts one value from another	x - y

*	Multiplication	Multiplies two values	x * y
/	Division	Divides one value by another	x / y
%	Modulus	Returns the division remainder	x % y
++	Increment	Increases the value of a variable by 1	++x
--	Decrement	Decreases the value of a variable by 1	--x

ASSIGNMENT OPERATORS

Assignment operators are used to assign values to variables.

In the example below, we use the **assignment** operator (`=`) to assign the value **10** to a variable called **x**:

EXAMPLE

```
int x = 10;
```

COMPARISON OPERATORS

Comparison operators are used to compare two values.

Note: The return value of a comparison is either true (`1`) or false (`0`).

In the following example, we use the **greater than** operator (`>`) to find out if 5 is greater than 3:

EXAMPLE

```
int x = 5;
int y = 3;
cout << (x > y); // returns 1 (true) because 5 is greater than 3
```

A list of all comparison operators:

Operator	Name	Example
==	Equal to	x == y
!=	Not equal	x != y
>	Greater than	x > y
<	Less than	x < y
>=	Greater than or equal to	x >= y
<=	Less than or equal to	x <= y

COMPOUND ASSIGNMENT (+=, -=, *=, /=, %=, >>=, <<=, &=, ^=, |=)

Compound assignment operators modify the current value of a variable by performing an operation on it. They are equivalent to assigning the result of an operation to the first operand:

expression	equivalent to...
y += x;	y = y + x;

x -= 5;	x = x - 5;
x /= y;	x = x / y;
price *= units + 1;	price = price * (units+1);

and the same for all other compound assignment operators. For example:

```
// compound assignment operators
#include <iostream>
using namespace std;

int main ()
{
  int a, b=3;
  a = b;
  a+=2;              // equivalent to a=a+2
  cout << a;
}
```

Tasks:

Question # 1: Write a program to take two float numbers then find remainder of them by using type casting in integer form.

Question # 2: Write a program to take input name, address and age from user, then display data on screen.

Question # 3: Write a program to take input a character and display its ASCII code.

Question # 4: Take an amount from user, interest rate and number of years from user let suppose 1000, 5% and 3. Find Interest amount for those years. (e.g. output for above values is 150)

Question # 5: Write a program to take dividend and divisor. Then display the quotient and remainder.(e.g. 20 3. Quotient=6, Remainder=2)

Question # 6: Write a program to take input base and height of triangle. Now calculate area by using formula Area=1/2 x base x height;.

Question # 7: Write a program to take temperature in Celsius and convert it into Fahrenheit by using F=9/5 *C +32;.

Question # 8: Write a program to take three digit numbers from user then display its reverse order.