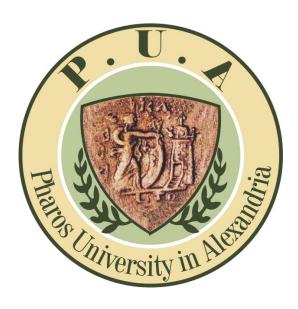
Pharos University
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## **Data Structures and Algorithms (CS201)**

Lab: 1

(variable - if condition - loops)

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## What is C++

- C++ is a cross-platform language that can be used to create highperformance applications.
- C++ can be found in today's operating systems, Graphical User Interfaces, and embedded systems.
- C++ is an object-oriented programming language which gives a clear structure to programs and allows code to be reused

### C++ syntax

```
#include <iostream>
using namespace std;
int main() {
  return 0;
}
```

**Line 1:** #include <iostream> is a **header file library** that lets us work with input and output objects, such as cout (used in line 5). Header files add functionality to C++ programs.

**Line 2:** using namespace std means that we can use names for objects and variables from the standard library.

Line 3: Another thing that always appear in a C++ program, is int main(). This is called a **function**. Any code inside its curly brackets {} will be executed.



Line 4: return 0 ends the main function.

# **Declaring (Creating) Variables**

To create a variable, specify the type and assign it a value:

### Type variableName =value

Create a variable called **myNum** of type **int** and assign it the value **15**:

```
int myNum = 15;
cout << myNum; -----> to print value of myNum
```

# datatype of variables:

# to display variables Cout<<

```
int myAge = 35;
cout << "I am " << myAge << " years old.";</pre>
```



## C++ User Input cin>>

```
int x;
cout << "Type a number: "; // Type a number and press enter</pre>
cin >> x;
The if Statement
if (condition) {
 // block of code to be executed if the condition is true
if (condition1) {
 // if condition1 is true
} else if (condition2) {
 // if the condition1 is false and condition2 is true
} else {
 // if the condition1 is false and condition2 is false
Example
int x = 20;
int y = 18;
```

```
int x = 20;
int y = 18;
if (x > y) {
   cout << "x is greater than y";
}

int time = 22;
if (time < 10) {
   cout << "Good morning.";
} else if (time < 20) {

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```

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```
cout << "Good day.";
} else {
  cout << "Good evening.";
}</pre>
```

# **Short Hand If...Else (Ternary Operator)**

```
variable = (condition) ? expressionTrue : expressionFalse;

Example
int time = 20;
string result = (time < 18) ? "Good day." : "Good evening.";
cout << result;</pre>
```

## **Switch**

```
switch(expression) {
  case x:
    // code block
    break;
  case y:
    // code block
    break;
  default:
    // code block
}
```



# loops

<u>While</u>	Do while	<u>For</u>
<pre>while (condition) {    // code block to   be executed } as long as a specified condition is true:</pre>	<pre>do {     // code block to be executed } while (condition);</pre>	<pre>for (st1; cond.; st2) {     // code block to be executed }</pre>

## **Example**

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### **Data Structures and Algorithms (CS201)**

## Sheet 1

- 1- Create a program that adds two integers using variables
- 2- Write a program in C++ to swap two numbers.
- 3- Write a program in C++ to find the Area and Perimeter of a Rectangle.

```
area=(lngth*width);
peri=2*(lngth+width);
```

- 4- Write a program in C++ to check whether a number is positive, negative or zero.
- 5- Write a program in C++ that takes a number as input and prints its multiplication table upto 10.