LAB NO: 1 **Date:**

INTRODUCTION TO COMPUTERS AND PROGRAMMING IDE

Objectives:

In this lab, student will be able to:

1. Introduction to Computers
2. Core functionality of the computer system.
3. Introduction to problem solving & programing paradigms
4. Algorithms and Flowcharts
5. Understand different components of a C++ program.
6. Write, compile and execute simple C++ programs.

I. INTRODUCTION TO COMPUTER HARDWARE AND SYSTEM SOFTWARE CONCEPTS

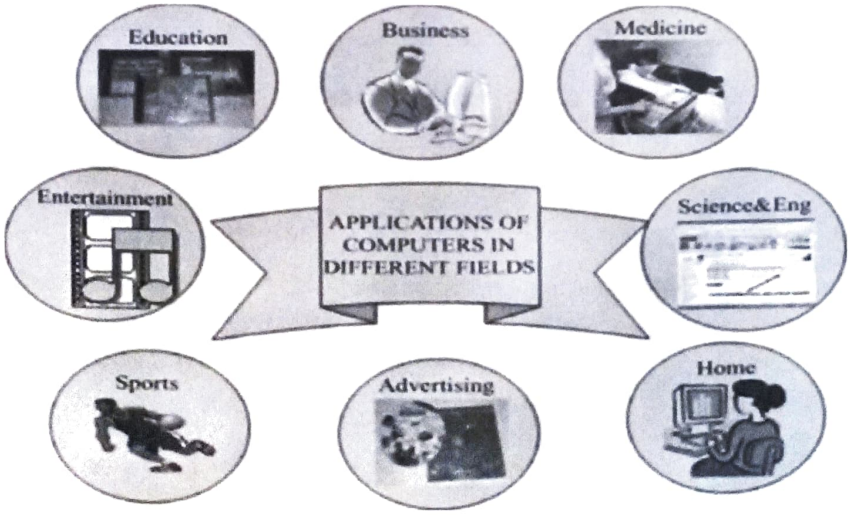
Introduction to computer

- ✓ What is a computer?
  - ✓ an electronic device
  - ✓ operates under the control of instructions stored in its own memory unit
  - ✓ accepts data (Input)
  - ✓ manipulates data (Process)
  - ✓ produces information (Output)

The key characteristics of a computer are

- ✓ Speed
- ✓ Accuracy
- ✓ Diligence – does not get tired
- ✓ Storage capability
- ✓ Versatility – doc preparation, play a music at the same time

Applications of a Computer



Example - Compute the area of circle

Name of the algorithm: Compute the area of a circle
Step 1: Start
Step 2: Input radius
Step 2: [Compute the area]
Area ← 3.1416 * radius * radius
Step 3: [Print the Area]
Print 'Area of a circle =', Area
Step 4: [End of algorithm]
Stop

Example - Largest of 3 Numbers

Name of the algorithm: Find largest of 3 numbers
Step 1: Start
Step 2: [Read the values of A, B and C]
Read A, B, C
Step 3: [Compare A and B]
IF A>B go to step 4
Step 4: [Otherwise compare B with C]
IF B>C then
Print 'B' is largest'
Else
Print 'C' is largest'
Go to Step 6
Step 5: [Compare A and C for largest]
IF A>C then
Print 'A' is largest'
Else
Print 'C' is largest'
Step 6: [End of the algorithm]
Stop

Example - Factorial of a number

Name of the algorithm: Compute the factorial of a number
Step1: start
Step 2: Input N
Step 3: fact ←1
Step 4: For count=1 to N in step of 1 do
begin
fact←fact*count
end
Step 5: Print 'fact of N=', fact
Step 6: [End of algorithm]
Stop

Assignment Statements

The statement *centimeters = inches * 2.54;* is an assignment statement. It calculates what is on the right hand side of the equation (in this case *inches * 2.54*) and stores it in the memory location that has the name specified on the left hand side of the equation (in this case, *centimeters*). So *centimeters = inches * 2.54* takes whatever was read into the memory location *inches*, multiplies it by 2.54, and stores the result in *centimeters*. The next statement outputs the result of the calculation.

Return Statement

The last statement of this program, *return 0;* returns the program control back to the operating system. The value 0 indicates that the program ended normally. The last line of every main function written should be return 0; this is indicated alternatively to void main ( ).

Syntax

Syntax is the way that a language must be phrased in order for it to be understandable. The general form of a C++ program is given below:

```
// program name
// other comments like what program does and student's name
# include <appropriate files>
void main()
{
Variable declarations;
Executable statements:
} // end main
```

Lab exercises

Most labs will have a synthesis section in which the student will write a program based on what the student has learned. The student is now directed to exercise the following simple programs using C++ code.

- Familiarization of Turbo C++ editor
- Menu Bar
- Key Short cuts (F1, F2,ALT-F9, CTRL-F9, ALT-F5)
- Context Help (CTRL-F1)
- Tracing a Program Execution- (CTRL-F7, F7, F8, F4)

Lab exercise

1. Type the following program in C++ Editor and execute it. Mention the errors in lab observation note

```
void main( )
{
        cout<<" This is my first program in C++ ";
}
```

2. Add the following line at the beginning of the above program. Recompile the program. What is the output?

```
#include<iostream.h>
```

3. Make the following changes to the program and observe the errors.

   i. Write **Void** instead of **void**

   ii. Re-write as **void main (void);**

   iii. Remove the semi colon '**;**' in statement (in bold letters) ii

   iv. Erase any one of brace '{' or '}'

4. Write down C++ statements to perform the following operations:

   i) $z = \dfrac{4.2(x + y)\ 5/z - 0.52x/(y + z)}{(x + y)^2}$

   ii) $x = a^2 + 2ab + b^2$

5. What will be the output of the mix mode use of integers and float (type the statements below in t program for outputs)

```
a=5/9;
b=5.0/9;
cout<<a<<b;
```