C++ Language Notes DEMO

Handwritten Notes

For more PDFs and notes visit my telegram page.. Named "BeingPro33"

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Programming Introduction

* A computer is an electronic device capable of performing arithmetic and logical operation.

* A computer system has two components : hardware and software.

* The CPU and the main memory are examples of hardware components.

* In computer system, when a user feed certain data for processing then it is up to the system that is respond on it or not.

* When there is no any action being expressed on it then it converted itself into garbage value.

* When certain processing happens as per the used software then it turns into as "Instruction".

* "The combination of specified instructions is known as Program".

* Every program tells a computer that what to do in order to come up with a solution to a particular problem.

* Programs are written using a programming language.

* The person who writes a program is known as programmer and the way of writing of a program is known as Programming.

* Programming Language -

A programming language is a formal language that is used to communicate instruction to a computer.

* A programming language consists of a set of rules, symbols and syntax that allow programmers to write code that the computer can understand and execute.

Eg:- C, C++, Java, Python, PHP ---

* Programming languages are often classified into different categories -

Here are three main categories of programming language.

i) Low-level languages -

These are programming language that are designed to be used directly with computer hardware.

Eg:- Assembly language, machine language

→ Assemblers are program that translate a program written in assembly language into machine language.

ii) Middle-level language -

These are programming languages are combine elements of both low-level and high-level languages.

Eg:- C and C++

Introduction to C++ Language

* C++ language is one of the world's most popular language.
* It is high-level language that means it is machine independent language.
* C++ language supports object oriented programming structure so it is called "Object Oriented Programming language.
* It is case sensitive language.
* It is developed by Bjarne Stroustrup in 1979 at AT and T's bell laboratory (USA).
* This language is first choice in programming competition because of its speed and easir less complex syntax.
* Features of C++ language -

i) Simple
ii) Portable
iii) Powerful
iv) Machine language
v) Structure oriented
vi) High level programming lang
vii) High speed
viii) High efficiency
ix) Flexible

* Application of C++ language -

i) Operating System development
ii) Web browser development (Not commonly)
iii) Game development.
iv) Database system
v) Network drivers
vi) Interpreters

* Difference b/w C and C++

C	C++
1) C follows procedural style programming.	1) It follows both procedural and object oriented programming
2) Data is less secured in 'C'.	2) In C++, we can use modifiers for class member to make it secure.
3) It follows top-down approach.	3) It follows bottom-up approach.
4) C doesn't support reference variable	4) C++ support reference variable.
5) Scanf() and printf() mainly used for ~~out~~ input/output.	5) cin and cout are used to perform input/output operations.
6) It doesn't provide feature of namespace.	7) It provides features of namespace.

Data types and Variables

* Any information is called as data.
  Eg:- name, age, marks etc.

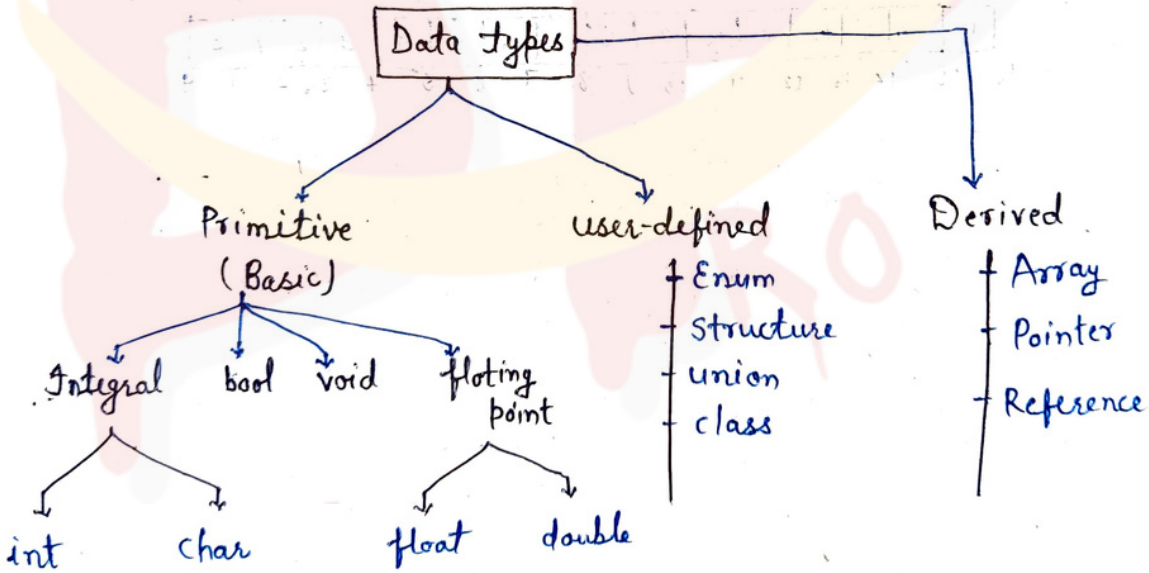
* Data types -

Data type is used to specify the type of data that a variable can hold.

→ Data stored only after the variable is declared.

→ Data can be both sign and unsigned.

* Types of data types -



Conditional Statements

* In C++, conditional statements is a type of control structure that allows the program to make decisions based on certain conditionas.

* The most common types of conditional statement in C++ are -

1) if statement -

The if statement is used to execute a block of code if a condition is true.

Syntax :

```
if (condition)
{
    // code to execute
        if condition is true
}
```

Eg:-

```
#include <iostream>
using namespace std;
int main()
{
    int x = 10;
    if (x > 5)
    {
        cout << "x is greater than 5" << endl;
    }
    return 0;
}
```

Loops in C++

* It is a block of statement that performs set of instructions.

"The looping is a process of repeating a single statement or a group of statements untill some condition for termination of loop is satisfied".

* **Types of loops -**

i) while loop -

When we want to do something a fixed no. of time but not known about the no. of iteration in a program then while loop is used

In this loop, first condition is checked, if it is true, body of the loop is executed otherwise control will be come out of the loop.

Syntax:

```
while (condition)
{
    // code to be executed repeatedly
}
```

Array

* Array is a collection of similar data items or elements.
* It is used to store group of data simultaneously.
* It can store data of same data type means an integer array can store only integer value, character array can store only character value and so on.
* Each location of an element in an array has a numerical index no., known as subscript, which is used to identify the element.
* Index is always starts with zero.

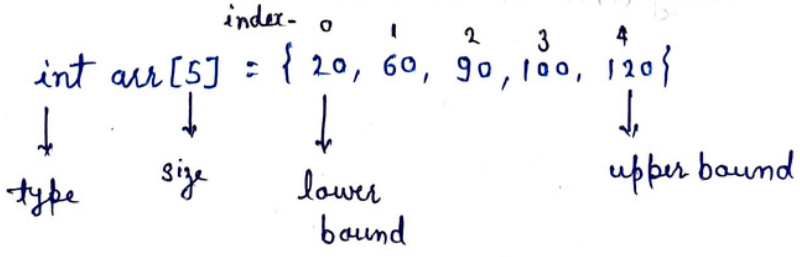
Syntax:

```
type  name[capacity];
```

Eg:- `int arr[100];` // declaration of an array

`int a[5] = {10, 20, 30, 40, 50};` // declaration & initialisation

* Array subscript (index) always start from zero which is known as lower bound and upper value is known as upper bound.



Pointer

* A pointer is a special variable that is used to store the address of some other variable.

* A pointer can be used to store the address of a single variable, array, structure, union or even a pointer.

* A pointer is a derived data type.

* Pointers provide a way to directly manipulate memory and can be used to create dynamic data structures.

* To declare a pointer, we use the asterisk (*) symbol before the variable name -

Eg:-

```
int *Ptr1; // Pointer to integer type

float *Ptr2; // Pointer to float type

char *Ptr3; // Pointer to char type
```

* When pointer declared, it contains garbage value ie it may point any value in the memory.

Note: `int *Ptr;`

→ Here the type int refers to the data type of the variable which is pointed by ptr not the type of the value of the pointer.

→ It means pointer 'ptr' can hold only the memory address of an integer variable.

String v/s Char

* Char type of variable can store a single character.

  Eg:- char c = 'A';

* String is an array of characters used for storing a name, word, sentence etc.

* "A group of characters enclosed b/w double quotes is called a string constant".

* It is terminated by '\0'.

  Eg:- char str[6] = {'H', 'e', 'l', 'l', 'o', '\0'};

  char str[] = "Hello"; ('\0' will be included at the end.)

* If null (\0) is not given at the end of character then the compiler automatically assume it.

* So, it is not necessary to giving null at last character of word.

Function

* When a task is more complicated then we divide the task into smaller task, in which each task is responsible for a part of the task.

"Function is a block of code that performs a specific task. It is a self-contained unit of code that can be called from others parts of a program."

* A function has a name, a return type and a set of parameters.

* Any c++ program contain at least one function i,e main().

* Why we need function -

i) Reduce program size

ii) Error checking (debugging) and maintenance are easy.

iii) Reusability

iv) Easier to write simpler task

* There are basically two types of function -

i) Predefined function (Library function)

ii) Userdefined function