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C/C++

PAARAS INSTITUTE OF EDUCATION (KASHYAP SIR)

Unit-1

What is Programming Language and how many types are there?

What is programming language? What is Programming Language

The computer itself does not do any work until a command is given to the computer. So Programming language is used as a medium to give commands to the computer until the computer is nothing. Just like which language is needed to communicate with a person.

Programming in that way to communicate with the computer and to give orders to it Language is required. Programming language is used to communicate with computer. That's why it is known as computer language or computer language. Apart from this, it is also known as Active Programming, Computer Programming or Coding.

Since humans have designed the Programming Language to communicate with the computer. That's why it is also called Krilim language. Through this, the computer is ordered in such a way that what will happen if done on the computer. Or how will it react programming The programming is done first through the language.

Whatever you see in computer, mobile, tablet or any other device. Or whatever you can do with these Levies. tell him say no The program is done through the programming language. Programming language is used to give instructions to the computer and make it work as per its wish. Website, Application and Software are created through Programming Language.

What is progra? (Program Meaning) The

word Program has been used above. Which is very important in Luck Programming Language.

We do many things with the help of computer. Which happens very soon. But to get any kind of work done by the computer, orders or instructions have to be given to the computer. because

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Computer cannot do any work by itself. Programs are written to give instructions to the computer. Which is also called Computer Program or Code.

Program or Computer Program is called a set of commands or instructions written in Programming Language. Computer Program is written to perform which specific task in the computer and that task works like that. The way it is written in the program.

Note that the computer works according to the program written by us. to program
It is created or written by Programmer or Software Engineer.

What is a programmer? (Meaning of programmer)

A person knowledgeable in programming language is called Programmer or Computer Programmer. These are the people who create Website, Application or Software with their Programming Skills. They have good knowledge of Programming Language.

Application or Application Software is required to work in computer. ashamed
Programmer or Software Engineer complete. They have knowledge of Programming Language. With the help of which you can make different types of applications. By adding some new features to the well-built application, you can make more use than before. Or you can remove the shortcomings of the application. They are mainly known as Programmer, Computer Programmer, Coder, Software Engineer.

Types Of Programming Language

To get the computer working according to itself, it has to communicate with the computer. The way you communicate with the person. Language is required for this. But computer is a machine and machine has its own language. Lajce Machine
Language is called. Every machine works on the basis of this language and
Understands language.

But remembering Machine Language is very difficult. so a lot of different
Programming languages are written. Which is easy for human to remember and understand.
All these computer languages can be divided into two types based on the level of understanding by humans and computers.

1. Low Level Programming Language (Low Level Programming Language)
2. High Level Programming Language (High Level Programming Language)

1. What is a low level programming language? (What is Low Level Programming Language)

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Low Level Programming Language is the beginning language of computer. Which is considered to be of the level of computer hardware. It is very liberating to understand this. It has to be run in the computer. Compiler or Interpreter is not required. Due to which Low Level Programming
The program written in the language does not take much time to run.

This saves memory and processor. Low Level Programming Language is divided into two parts.

1. What is Sheen language? (What is Machine Language)

Machine language is the sign language of the computer. It is a simple programming language. For which no translator is required. Because computer can understand it very well. That's why it is known as the native language of the computer. Machine
Language works on the basis of Binary Digit. The sequence made up of 0 and 1 is called Binary Code or Binary Digit.

In which 0 is off (Off) and 1 is on (On) signal. A machine works on an off and on basis only. That's why it is called the native language of the computer. Use of Machine Language
To write programs is a free and more time consuming task. because in
To write programs, machine signals have to be remembered in numbers. That's why the chances of making a mistake in it are also very high.

2. What is assembly language? (What is Assembly Language)

In Machine Language, symbols had to be remembered in numbers. Which is a sacred work. This is why Assembly Language was developed. In Assembly Language, letters and symbols were used instead of binary digits. That's why it is also called Symbol Language.

This is the programming language of the second book. In which pneumonic code is used. Which is much easier to remember than Machine Language. like; LDA (Load), ADD
(Adding), SUB (Subtraction) etc. Machine code is determined for each of its codes. Which is translated by Assembler.

2. What is a high level programming language? (What is High Level Programming Language)

High Level Programming Language is a type of programming language. In which English letters, numbers and symbols are used. It does not depend on the machine. This is the link for the computer to understand because computer only understands machine language. That's why High Level Language is also later translated into Machine Language with the help of Compiler or Interpreter. like; Basic, C/C++ etc.

Programming

What is Translator? What is Translator

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Translator is also a set of instructions written in a computer program or programming language. Whose work except machine language, all other programming languages Converts or translates into Machine Language.

Because the computer only understands Machine Language. But too many for the easy of human High Level Programming Language has been created. Machine with the help of Lajse Translator Language is entered. Translators are of different types.

1. Assembler

Assembler Assembly Language in which letters and symbols are used. Assembler is used to convert it into Machine Language.

2. Compiler (ÿÿÿÿÿÿÿÿ)

Compiler is used to convert the program or source code written in High Level Programming Language into Machine Language. Compiler can read the entire program at once and tell the errors in the program. When the errors are removed from the program, the program is converted into machine language.

3. Interpreter

Interpreter also translates to High Level Programming Language. But instead of translating the entire program at once, it translates instructions from the program one by one. When the whole program gets translated. Then the End Program responds.

Use of Programming Language

Above we have explained Programming Language in very easy language. Programming with What is Language? It must have been known. Here we have explained the use of Programming Language. Why and for what tasks is the programming language used? With this, its use and work will be clearly understood.

1. Used to give instructions to the computer. 2. Programming language is used to make the computer work according to itself. 3. Used to communicate with the computer. 4. Computer is used for customizing the design. 5. Programming language is used to create applications or software. 6. Programming Language is used to create a website.

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ÿÿ ÿ Popular Programming Language

1. JAVASCRIPT

Javascript was created in 1995 by Brendan Eich. Which is a popular Scripting Language. It is used for both Client Side and Server Side. but you are the best
Used as Client Side Scripting Language.

It is easy to dry and use. It is used to make the website dynamic. Web developers should learn Javascript along with HTML and CSS. Because with this the website can be made interactive.

2. PYTHON

Python was created in 1991 by Guido Van Rossum. It is called General Purpose and High Level Programming Language is called. It is also an object oriented text/intermediate language. It is also a scripting language. Which is easy to learn, understand and use.

If you are learning Programming Language for the first time. Then you can start with this also. It is used to create most web applications, game development, server sites and websites. It is being widely adopted in machine learning and artificial intelligence.

3. JAVA

Java was introduced in 1995 by Sun-Micro System. It is a General Purpose and
Is High Level Programming Language. James in the Weber of the Java Programming Language Gosling was a major developer. It is mainly called Software Development and Application are used for development.

Programs or codes written in Java can be run on any operating system. It is completely based on Object Oriented Programming Language. This C++ Programming
The functions of language are also similar.

4. C/C++

C and C++ both are different programming languages. and both High Level Programming Language is. The C programming language was created for Unix programs. But now it is used to make all kinds of applications.

C++

And this Programming Language also works on almost all the databases. He Programming language originated from C programming language. That's why C programming Language is similar to C++ Programming Language. But you are not one.

5. PHP

PHP is Open Source and Server Side Scripting Language. Which is specially used for server side in web development. Dynamic Webpage can be created from this. Today PHP is very popular for creating dynamic websites.

The full name of PHP is Hypertext Processor. Usually it is used for Dynamic Website, Static Website, Web Application and Login etc. are created.

What is Algorith - What is Algorithm

The word, Algorithm refers to those *'Series of Steps'* , which are responsible for completing or executing a particular computation or task. Next we will understand the definition of algorithm in more detail.

It was originally developed to solve mathematical problems. But currently the term is strongly associated with Computer Science.

Definition of Algorithm

Algorithm is a set of instructions, which defines the complete procedure to solve a problem. Its main goal is to get the expected output. There are many continuous steps in it, only after the completion of which the output comes.

This can be understood with the example of making a cup of tea:

Step 1. Fill the bowl with paan

Step 2. Boil the Paan

Step 3. Put tea leaves in the center

Step 4. Add ginger to the cooter.

Step 5. Add 1/2 teaspoon of chickpeas

Step 6. Let the tea brew

Step 7. Strain the tea and pour it into a cup.

Just like to make a cup of tea, we have to execute the above mentioned steps again and again. That way , in programming, Algorithm is written to perform which process or task, so that the desired result can be obtained.

It is used in many different fields, the main ones being computer science and error. For example Search Algorithm, it is a step by step process which is used to retrieve the web-page stored inside the data structure.

Who is the founder of the algorithm?

It has a long history, but the actual word "Algorithm" was first introduced in the 9th century. Abu Abdullah Muhammad ibn Musa Al-Khwarizmi, a Persian philosopher of that time, is considered its founder. He is also known as The Father of Algebra.

In fact, **Al-Khwarizmi** built upon Brahmagupta's work . Brahmagupta was a great Indian geographer and astronomer. Both these great men got fame when
The term 'Algorism' was used to refer to the Latin translations of their arithmetical rules using Arabic numerals.

After this, the word 'Algorism' became the modern "Algorithm" around the 18th century. In its modern form, it is also used in areas like Calculation, Data Processing and Programming, besides solving the problems of daily life. So the word algorithm is a step by step process that is designed to solve a problem or task.

Properties of Algorithm

We cannot call any process as Algorithm. The optimal algorithm should be used or it should solve the problem. For this to happen, some tricks of an algorithm
(Properties) exist. That is, it should fulfill the following criteria as mentioned below:

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1) **Input:** An algorithm should have well-defined inputs. Input is the data or information that we enter in order to provide output.

2) **Output:** It should produce the output. That is, the correct solution to the problem should be provided.

3) **Clarity (Unambiguous):** Every instruction or step written should be clear. The input/output of each step should also be clear.

4) **Finiteness:** It means that there are a finite number of steps written in the algorithm.
Should be terminated after (finite number). Finish means, you should get the expected output and not get stuck in the processing loop.

5) **Effectiveness:** The algorithm should be practical, so that it should be possible to execute the instructions with the available resources. i.e. any unnecessary instructions in it
(Unnecessary Instructions) which would make it ineffective.

6) **Language Independent:** The instructions should be written in different languages. Which can be implemented in any programming language.

Example of Algorithm

Different languages are used to write the Algorithm. Let us understand this with the simplest example.

Example 1– Calculating the average for 3 numbers.
Algorithm:

Step 1. Start

Step 2. Read 3 numbers A, B, C

Step 3. Calculate the average by the equation

Average = (A+B+C)/3

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Step 4. Display Average

Step 5. Stop

Example 2– Find the largest among three different numbers entered by user.
Algorithm:

Step 1. Start

Step 2. Declare variables a,b and c

Step 3. Read variables a,b and c.

Step 4. If a > b

If a > c

Display a is the largest number.

Else

Display c is the largest number.

Else

If b > c

Display b is the largest number.

Else

Display c is the greatest number.

Step 5. Stop

Types of Algorithm

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Although there are many types of it, but the most basic types are given below.

1. Simple Recursive Algorithms
2. Backtracking
3. Divide and Conquer
4. Dynamic Programming Algorithm
5. Greedy Algorithms
6. Branch and bound Method
7. Brute Force Algorithms
8. Randomized Algorithms

What is Flowchart? What is Flowchart

Flowchart What is a flowchart?

The representation of an algorithm or program in the form of lines is called Flowchart . That is, in flowcharts, the algorithm or program is displayed with the help of lines.

Flowcharts prove to be very useful in writing programs, through this we can understand the solution easily. programs

There are many symbols used in the flowchart which program to the flow of indicate.

It helps the user to understand complex processes. it step by step Which helps in understanding and solving the problem.

Flowcharts are used in programming to perform many tasks such as – in creating programs, debugging programs, and solving complex programs.

Flowchart Symbols

Start/Stop Symbol – This symbol is used at the beginning and end of each algorithm. This is the first and last symbol on each chart. Its head is oval (shaped). It is also known as terminal symbol.

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startstop symbol

Input/Output Symbol – In this the input symbol is used to represent the input and the output symbol is used to represent the output. Its plane is a parallelogram (parallelogram).

input output symbols

Processing Symbol – It is used to represent error or operations like – multiplication, division, addition, subtraction etc. Its handle is rectangle.

processing symbol

Decision Symbol– It is used to give decision. There are decisions like true / false or yes / no. Its key is diamond (diamond).

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codesign symbol

Connector Symbol – This symbol is used to connect two or more parts of the flowchart. Its target is circle.

connector symbol

Flow Line Symbol – It is used to represent the sequence of flowcharts. Its pointer is arrow and the direction of this arrow can be up, down, right, left.

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flow line symbol

Hexagon Symbol – This symbol is also called preparation symbol. It is used to introduce for loop, while loop, or other loops. Its latch is a hexagon.

Hexagon

Symbol Document Symbol– It is used to represent the document. Its address has been given.

document symbol

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Advantages of Flowchart in Hindi – Advantages of Flowchart 1- It helps to understand the logic of which program.

2- Through this we can easily design the Lux program and software.

3- Flowchart helps in debugging.

4- Using this the program can be easily analyzed.

5- It helps programmers to write the code of high-level language like- Java, C, C++ etc.

6- It helps in maintaining the documents.

7- Documents can be connected and stored using flowcharts.

8- It helps in texting software. 9- With the help of flowcharts, it is easy to maintain the program.

Disadvantages of Flowchart

1- Making a flowchart of a big program is very liberating.

2- It takes a lot of time to make flowcharts.

3. It is free to reproduce the flowchart.

4- Making changes in flowchart is free.

5- It does not have any stand.

How to make a flowchart

There are some rules to make flowchart which we should follow.

In flowcharts , the center V can be a start and stop symbol. In this only conventional (conventional) symbol should be used.

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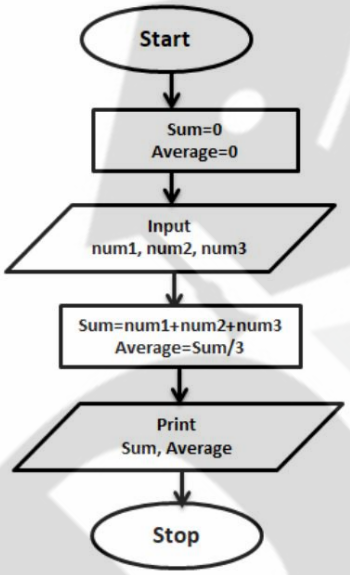
Name and variable should be used in flowchart . If the flowchart is big and clean, then connector symbols should be used in it.

Example of Flowchart –

Given below is the flowchart of sum (sum) and average (average) of the following numbers: –



Flowchart to find sum and average of three numbers

What is C language? What is C Language

C language is a computer programming language that was created about 50 years ago. Almost all the programming languages that came after this have been derived directly or indirectly from these languages. Today we are going to talk in detail about what is C language.

C Language ÿÿÿÿ ÿÿ? What is C Language

C language is a type of computer programming language which is used for Software, Desktop Application, It is used in making Operating System etc. It is one of the most widely used programming language in the world.

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C/C++

The C language was created in 1972 by Dennis Ritchie at Bell Telephone Laboratories, which was initially developed to create an operating system.

This language is a middle level language in which English words are used like other high level languages and it is also a user friendly language but along with this low level features are also found in it.

This is the reason why C language is used in both application programming and system programming (to create operating system).

C Language is a general purpose programming language that can be used to create any type of program.

It is also called structured programming language because in it all the codes are divided into different blocks and organized from top to bottom.

Features of C Language – Features of C Language

1. **Portable:** C programming is portable i.e. once the program is created it can be run on any other machine. 2. **Easy to learn:** C programming is very simple and can be learned by school children very easily.
   Can
3. **Simple & Efficient:** The method and syntax of writing code in this is very easy.
4. **Speed:** It is compiler based language which is faster than interpreter based programming languages like Java, Python etc. 5. **Library files:** In C, you get a library of built in functions, using which you can easily make programs in less time. 6. **Procedural Language:** C programming is a procedural language i.e. in this all the instructions are written step by step and execute in this order. 7. **General Purpose Language:** C is used to create different types of software-, applications etc. 8. **Statically Typed Language:** Statically type means here the programmer has to tell the data type of each variable in advance. That is, in compile time itself it is known that in which variable which type of data input is to be given.

History of C language

In 1958, a computer programming language named ALGOL (Algorithmic Language) was invented and influenced by it, many other languages were created.

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In 1967 Martin Richards invented BCPL (Basic Combined Programming Language) which was developed for creating system software. In 1969 Ken Thompson created another language influenced by BCPL called B Language
Name loaded.

BCPL and B language both were typeless language ie datatype was not used in it and same memory was allocated for each type. In 1972, Dennis M. Ritchie discovered C language which was created for Unix OS.
Was.

C was derived from ALGOL , BCPL and B but added the important feature of data types. In 1983, the ANSI (American National Standard Institute) team defined the standard for C language.

This work took 6 years and in 1989 the approved version was named ANSI C. In 1990, ISO (International Standard Organization) approved C too, which

Known as the C89.

What are the benefits of learning C programming language?

C is a middle level language and how it compiles and executes computer programs,
The understanding of CPU cache, register, memory, computer architecture etc. increases and with this you can also do complex level programming like operating system, compiler designing.

By learning C language, you can go into the field of Embedded Programming where the robot goes and for which the hardware and software
make different types of machines
Coding is done for interaction.

C language has been around for 50 years but despite this it is still included in the list of most popular programming languages.

C language is a generic type, procedure oriented programming language developed in 1972 **by Dennis Ritchie at AT & T'S Bell Telephone Laboratories,** US. Dennis Ritchie created the C language to make the Unix Operating System.

What is C language? – What is C

Language C Language is a **general-purpose** programming language created by **Dennis Ritchie** in 1972 at AT **& T'S Bell Telephone Laboratories .** Dennis Ritchie wanted to build an operating system called **Unix Operating System,** for which Dennis Ritchie had developed the language.

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The special thing is that with the help of this language we can do **low level** programming. its this Due to the feature use of C programming language System software like – **Operating system, Device Driver, Compiler** Used to make Alad.

In C Language, the basic topics of all programming languages are covered (like – **Variable, Data Types, Array, String, Function, Structure, Pointer, Loop** etc.) due to which C language is called **mother** language of all programming languages.

Once after learning this language, you child can learn all the programming languages very easily.

What is the history of C language? (History of C language in Hindi)

Before becoming **C Language ,** in 1966 , a person named **Martin Richard** made a programming language named **BCPL** by combining the basic concepts of all the programming languages of that time in AT & T'S Bell Telephone Laboratories, US, whose full name is **Basic Combine Programming Language** |

BCPL was not suitable for making large software. Also it had coding in Low Level style.

Ken Thompson , who worked with Martin Richard at **AT & T'S Bell Telephone Laboratories ,** created **B Language** in 1969 by improving the BCPL language.

Actually Ken Thompson wanted to make an operating system which needed a good programming language to make it and that language was B Language. After creating the language, he created the Unix **Operating System .**

Dennis Ritchie at AT & T'S Bell Telephone Laboratories who **created** the C language in 1972 and said to Ken Thompson
If made with the help of language, more things can be done in it, in which the biggest feature was the **portability** of the operating system.

Following are the features of C language (Features of C language) :

C is a simple and easy programming language. In C language, there are Command/Instructions like English, which have to read, understand, code It is very easy for a programmer to do. C is a Procedure Oriented Programming Language.

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C is very powerful and case sensitive programming language. C Language is Compiler based, dynamic programming language. C Language is a Middle level language due to which both Low Level and High Level programming can be done. Most widely used in developing language operating systems and embedded systems

What is known programming language.

C language is portable and powerful programming language. The language is a Syntax Based Language. It is a generic type programming language which covers the basic topics of all languages.

does it

Hello World Using C language In Hindi Just to

give you a little excitement about C programming, I have written a small traditional C programming **Hello World** program.

```
#include<stdio.h> int
main() { printf("Hello
World"); return (0): }
```

Output -:

Hello World

Difference between C and C++ in hindi

c	**C++**
C is a Procedural Oriented Programming language	C is an Object Oriented Programming language of sorts
there is no reference variable in it is found.	Reference variable is found in it.

In this scanf is used for input and printf is used for output.	In this, cin is used for input and cout is used for output. use for
Here the members of the structure cannot be of function type, all the members will be of data type.	In this, members of a structure can be of both data-type and function types.
Because it is POP type language so it does features like data hiding, class Encapsulation data abstraction data inheritance. no support	It supports all oops features.
In this memory allocation is done by calloc() and malloc() whereas memory de-locate is done by free().	In this dynamic memory allocation is done with new operator while memory de -location is done with operator delete.
In c language divided into a program function, I get divided.	there is program class and object in c++ language.
The extension type of c file is .c.	The extension type of a c++ file is .cpp.

If we talk about the difference between C and C++, then it is mainly the difference of OOPs.

The concept of OOPs is based on class and object, because in C++ almost all the features of OOPs like data abstraction, data hiding, inheritance etc. are implemented from the class itself.

What is C++ in Hindi? What is C plus plus?

C++ is a very powerful **General Purpose Programming** language. It can be used to create Operating System, Browser, Games etc. C++ explains the different methods of programming such as Procedural, Object Oriented and

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functional and thus it makes C++ powerful as well as very fast.

C ++ can also be called a Middle Level Programming Language. Because it supports both High Level and Low Level Programming Languages and allows to choose them.

Game programming, Software Engineering, Data Structure, developing browser, operating system, different types of applications, and many more are programmed in C ++, do you know how to make iPhone and iPad programming codes very easy and reusable Also “C++” language is used for this.

History of C++ language

The C++ language was created in 1979 by Bjarne **Stroustrup ,** a computer expert. When he made it, he named it C with Class. because it is called C Programming language was created by adding sambolit and some new features. The main purpose of its creation was to include Object Oriented Programming. But he had to face some difficulties in this too due to which it was abandoned in the year 1983. was addressed as C++.

What is C++ in Hindi

Features of C++ language

There are many features of C++, so let's see them -

Object Oriented Programming - C++ is completely an Object Oriented programming language is because in this we write programs considering things as objects.

Linked to compiler (Compiler based)

C ++ language is a compiler based programming language in which the program cannot be run without compiling it, therefore it works on compiler system that if we call a program then we can execute and run that program from which we will get its output.

Platform Converter (Platform Dependent)

Platform Dependent means that in which the versions of the program can be executed on the operating system where it is developed and executed. It can neither write nor execute on any other operating system.

C++ is a database dependent language. Having said that, C++ programs can be executed on multiple machines with little or no change.

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Powerful and Fast)-

C ++ is a very fast and powerful language because it takes less time for compilation user and execution or we can also say that it takes less time to execute the source code. The time taken to output minutes is reduced. Apart from this, it has a very large variety of data types, functions and operators.

Case sensitive language (C++ is case sensitive)

C++ is a case sensitive language because the words written in C++ in lower case letters (small letters) and upper case letters (capital letters) have different meanings.

C (Applications of C++ Language)

There are many applications of C++ language, let's have a look at all of them -

Who doesn't like
playing computer games, **nowadays** not all people are fond of computer games, but do you know how they are made? If not then know that C++ language is used in this

C ++ language is used by most of the biggest gaming companies, the first name comes in this, Rock star Games, which made games like GTA, the engines of these companies are also completely written in C ++ language.

C++ simplifies the complexity of 3D games and helps optimize resources.

Using Media Access

C++ is also used to create Media Player, Video Files and Audio Files.

The best example of this is Winamp Media Player, built in C++, which allows users to enjoy music, access and share videos and music files.

Scanning apps and software

C ++ is also very useful in scanning apps and software, the codes of applications like film scanner or camera scanner are also written in C ++, if you see more in this, then the use of C ++ is useful in converting PDF technology and document technology.

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C++Basic Codes of C++ language

After knowing so much about C++, it is of course that you would like to know about its calling as well, then the most basic calling in C++ starts with 'Hello World'. So let's see how its code is written and how it is executed after writing the code.

```
#include <iostream>

Int main()
   { Std::cout << “Hello World!”;
   Return 0;
}

Hello World
```

Concepts of OOPS in Hindi – OOPS ÿÿ ÿÿÿÿÿÿÿÿ ÿ what are s

OOPS concepts

The full name of OOP is object-oriented programming (object-oriented programming). The concepts are as follows: - ls. oops

1. Object 2. Class
3. Encapsulation 4. Abstraction 5. Inheritance
6. Polymorphism 7. Message Passing **Object**

object is an instance of a class which holds the actual value in place of a variable. An object is a concrete run-time entity. In general, an object is anything that can be identified. The abstract objects around us like:- pen, book, chair, stool etc. are all objects.

, T and

Class

A class is a group of objects of the same type. For example:- Mango, guava and apple etc. are all fruits, and they all became members of the class fruit. A class is a user-defined data type and a class is a collection of data and functions.

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Encapsulation

Combining (combining) data and functions into a single unit is called Encapsulation . In this the variables of the class are private and they cannot be accessed directly outside the class.

Encapsulation is done in the form of a class. In a class, we can keep data and methods together in the form of a unit.

Abstraction

Abstraction means to display only the essential information of the object and keep the background information hidden.

For example – when we drive a car, we know that when we press the accelerator, the speed will increase and when we press the brake, the car will stop, but we do not know why it stops. In this way pressing the keys easily things are shown. In Java, abstract class and interface are used to achieve abstraction. complex (clear) things are hidden in OOPS and only necessary and simple

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Inheritance

The meaning of inheritance is 'Lavasat'. Inheriting the properties and methods of another class by one class in Java is called inheritance.

The class which is derived from another class is called subclass and the class from which subclass is derived is called super class.

We also call superclass as base class and we also call subclass as derived class.

Polymorphism

Polymorphism is a word derived from the Greek language, in which poly means many and morphism means forms. So polymorphism means many forms.

Polymorphism is such a concept in which we can do the same thing in two different ways.

1:- Compile-time polymorphism (static polymorphism)
2:- Run-time polymorphism (Dynamic polymorphism)

1: - Compile time polymorphism: - We also call Compile time polymorphism as method overloading or early binding. This polymorphism means that we declare methods of the same name with different signatures because we can perform different tasks with the same method name.

2: - Run-time polymorphism: - This type of polymorphism is called late binding or dynamic binding or method overriding. This polymorphism means that we declare methods of the same name with the same signature.

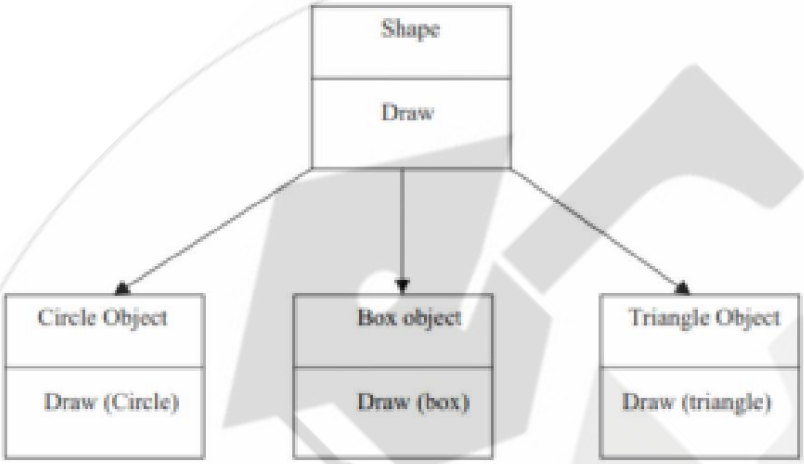


Fig. 1.7 Polymorphism

Message

Passing Objects communicate with each other by sending and receiving information. Objects send and receive messages in the same way as people do. A message is a request for a procedure and it invokes a method in the receiving object.

Advantage of OOP

Its benefits are as follows:-

1. The structure of the program is very simple in this, due to which the complexity is reduced. 2. We only need to write the code once in it and we can use it again and again. can do. 3. It provides data redundancy. 4. In this we can easily maintain the code, which saves time. 5. Data hiding and abstraction are used in object-oriented programming, which improves security in it. 6. If debugging is to be done in it then it can be done easily.

c++ function introduction

A function is a group of programming statements that perform a particular task, such as addition or calculation of the floor area, etc. Every function has a unique name, by this name you can use the function anywhere. Let's call this function program

By using the function, you need to write the same code again and again. You can create a function and cannot use it anywhere in the program. By using the function, your program becomes more readable. can be debugged easily program

c++ There are **2 types** of functions

Built **in function** – These are the functions that c++ already provides you through libraries.

User **defined functions** – These are the functions that programmers create themselves, the most common user defined function is main(), you are being given about it below

main() function

There is a starting point of the program which is specified by the main() function, its example is being given to you below.

c language but in c++ main() function return of integer in c++ return data in the main() function Let's type in

int main()

Whenever the return type of a function is defined, the function returns a value, so you define the return zero statement at the end of the main() function, whose example is given below.

return 0;

In creating function in c+

c++ + you create functions in 2 steps

1. function declaration/prototyping

-

2. function definition

You are being given below about these steps

function declaration /prototyping

Whenever you create a function in c ++, first of all you define the function prototype, the function prototype provides basic information about the function to the compiler like
K

1. **return** type-what kind of value the function will return 2. name-function will be called by which name 3. **parameters-** what type and how many arguments in the function pass can be locked

The compiler uses this information to call and execute the function, so let us now see how you can define a function prototype whose general syntax is given below.

return_type function-name(parameter1,parameter2,.....parameter n);

Whenever you define the prototype of the function, first of all define the function return type, it can be any data type like int, float, etc. After that you give a unique name to the function, after that you define the parameter. This is the value that you will pass while calling the function, along with the parameter, you also define their type, so let's try to understand it with an example.

Suppose you are creating a function, which takes 2 integer numbers as an argument, and multiplying them returns the result, then you can define the prototype for this function as follows

int mul(int a,int b);

function definition

The function definition is a block in which you write the statements that you want to execute when the function is called, then the function definition is defined like a function declaration / prototype, but it is not terminated with a semicolon and Inside the curly braces, you write the statement that you want to execute, the structure of the function definition is being given below.

return-type function-name(parameter1,parameter2,....parameter n)

```
{

    //statement

}
```

So let's understand it by example, below the definition of that function has been created whose prototype has been created above.

```
int mul(int a ,int b)

{

   return a*b;

}
```

using function

Once after creating the function, you use it in the program wherever you want to use the function, then you call it there, then at the time of calling the function, you do the required arguments in it, which is the type of these arguments. It should be the value that you had given while defining the parameter, otherwise the compiler generates an error.

If arguments are not passed in which function, the pass If you want to do, you simply put brackets and semicolon basic syntax for calling the function is given below.

```
function-name(argument1,argument2,....argument n);
```

For example, if you want to call the function created above, then you will do it like this

```
mul(3,8);
```

In the above example , **the mul() function** has been called, while declaring the function, the type of parameter was given as int, so here I have passed two integer values, so this function will multiply these two values and return the result if you want. You can also pass 2 integer variables without passing the value directly, as in the example given below.

-


```
int a=3;

int b=8;

mul(a,b);
```

If you call the same function as in the above example, the result will be the same. A complete example of the use of the function is being given below.

```
#include<iostream>

Int mul(int a,int b);

Int main()

{

    Int a=2;

    Int b=3;

     Cout<<"multiplication of 2 & 3 is :"<<mul(a,b);

}

Int mul(int a,int b)

{

   Return a*b;

}
```

below The above program generates the output given

multiplication of 2 & 3 is :6

call by reference

you call the function which is assigned to the value pass, all the changes are made in these parameter variables only and there is no change in the value of the actual variables.

For example, suppose that you have created the increment() function, which increases the value of the variable by 1 number.

```
void increment(int a)

{

   a=a+1;

}
```

While calling the function created above, in this you will do a variable like this

```
int a=10;

increment(a);
```

According to the definition of the function, when the function is called, the value of a variable should change from 10 to 11, but this will not happen, the change made in the variable inside the function will affect the parameter variable, original variable will remain the same outside the function, if you print the value of a from the function, then the value will be 11.

Many times while programming, there is such a situation that you have to change the value of the original variable, for example, if a website creates a function to cout the number of its visitors, then it is necessary that the change should be on the original variable.

In such a situation, you can use the call by reference feature of c++, c++ provides you the capabilities to pass the reference of the actual variable in the function, you do this by the address-of (&) operator.

When you declare a parameter variable in a function by reference, then these variables also point to the memory location to which the original variable points, so when you perform any change on these variables, the original variable also changes.

-

To call the function by reference, you read the address of operator before the parameter variable, whose example is being given below.

```
void increment(int &a)

{

    a=a+1;

}
```

You will call this function like this

```
int a=10;

increment(a);
```

When you call the increment function, then the value of a variable here is the original variable, it will change to 11, it is being explained by a complete example below.

```
#include<iostream>

Using namespace std;

Void increment(int &a);

Int main()

{

   Int a=10;

    Increment(a);

   Cout<<"value of after function call is <<a;

}

Void increment(int &a)
```

-


```
{

    a=a+1;

}
```

The above program generates the following output

value of a after function call is : 11

Prototype Meaning in C/C++

Prototype Meaning in Hindi: The initial form of any Model is called **Prototype ,** then that Model can be of any type. For example for which Builder which new
The map or blue print of the building is the prototype of the building for that builder. In this way, for which automobile company, which new car model, which new car to be made?
Prototype. Generally **"C"** and **"C++"** programming under Programming Concept
The word Prototype is used in languages. When we
create a program in **"C"** and **"C++"** programming languages, we create different types of functions to meet different needs, which are used by the user.
are called **defined functions .**
Since these functions are created by the programmers themselves according to their needs, therefore generally the compilers of **"C"** and **"C++"** programming languages were made these new ones.
There is no information about functions and until the compiler
There is no information about the created User Defined Function, till then we
Those newly created functions cannot be used in the program. If we do this, then the Compiler gives **us Compile Time Error** while compiling the program. our vehicle
Does not allow the program to
compile. To avoid this problem, it is necessary that whatever User Defined Function we have created, before using **it in the main ()** Function, the Compiler should be aware that in the main () Function, the functions are used. has gone. To give information about this to Compiler, we specify **Prototype** of all our created functions before main () Function. These Specifications are also called **Function Declaration .**
To understand the concept of Prototype easily, we see an example as follows, in which we have a Function Declaration (Prototype) to add two numbers and that Function
Creating both the definitions and then calling that function in the main() function-

```
/*Header File for using printf() and scanf() like Built-In Functions  in our main() Function.*/ #include
<stdio.h>
```

-


```
/* Function Declaration or Function Prototype of User Defined Function  "addition()", so that we can use it in main() Function. */ int addition(int, int);


main() {

        printf("Total of 10 and 20 is %d", addition(10,20));
}

/* Function Definition */ int addition(int a,
int b) {

        return a+b;
}

/*OUTPUT*/
Total of 10 and 20 is 30
```

When this program is compiled, then Compiler ***Top to Bottom*** and ***Left to Right*** compiles this program. As a result Compiler first finds the *#include <stdio.h>* statement, which instructs the Compiler to include the Header File named **stdio.h** in the current program, so that this Header File already **defines** Functions like printf **(), scanf ()** done can be used in **main ()** Function. Irr Compiler **int addition(int, int);** Statement is reached. This statement instructs the compiler that in the main() function of the current program, we will use a *UDF (User Defined Function)* named **addition() ,** which will accept two Integer Type values as parameters and return

The value calling function will return an integer type as the value. **This Declaration itself is called Prototype,** which gives the following information to the Compiler about a new User Defined Function: 1. What is the name of the new User Defined Function. 2. What type of function and how many parameters it accepts as Argument

And

3. What type of value does it return as Return Value? After this Function

Declaration Compiler reaches to main( ) Function and executes **printf()** Statement of main() Function, in which Function value named **addition()** is called with two Parameters of **10** and **20 .** Function calls are there when the program control reaches the definition of the function named addition(). The parameters coming in the Function Definition are processed and added to each other and their sum is then returned to the Calling Function, where that value is displayed in **30** Output.

Print is done.

-

Data Types

Data Types

In C++, a data type variable Tells about the type of data stored by. Like luck – integer, float, character etc.

In other words, “Data type is used to tell about the type of data to be stored by the variable. Whenever any variable is defined in c++, it is given some memory based on the data type. Each data type requires separate memory.

In C++, there are 3 types of data types:-

1. Basic data type 2. Derived data type 3. User-definded data type

Basic Data Types

The basic data types are given in the table below.

Data Type	Meaning	Size (in Bytes)
Int	Integer	2 or 4
Float	Floating-point	4
Double	Double Floating-point	8
Char	Character	1
wchar_t	Wide Character	2
Bool	Boolean	1

Void	Empty	0

1). int –

• The int type is used to store integers. Its size is 4 bytes, which means it can store values from -2147483648 to 2147483647. Its example int **student = 5600;**

2). float and double –

float and double are used to store floating point numbers

Is.

The size of float is 4 bytes and the size of double is 8 bytes. **Example** float temp1 = 96.5

double temp2 = 156.4

3). char –

• The char array is used for characters. Its size is 1 byte. Its range is from -127 to 128 or from 0 to 255. In C++, characters are placed inside single quotes. For **example** –

.

char name = ‘Kamal’

4). **wchar_t –**

Its full name is wide character, it is similar to .char, the only difference is that its size is 2 bytes . These are used to store those characters which require more memory.

required. • **This example** –

wchar_t = Kamal 'ÿ'

The thing to note in this is that Kamal is written before single quotes.

5). bool –

The bool data type has two possible values – true or false. It is generally used for conditional statements and loops. Its size is of 1 byte. This **example** –

```
bool condition = true;
```

6). Void –

• The value of void tells the absence of data which means .“nothing” or “no value”. It is empty i.e. its size is 0 . The thing to note here is that we do not declare void type variables.

do

Can.

Derived Data Types

Those data types which are derived from primitive or built-in data types are called derived data types. These are of four types:-

1. Function
2. Array 3. Pointer 4. Reference
5.

Function – A function is a block of code and it runs when it is called. It is used to accomplish a specific task. By using functions, we can use the code again. So that one has to write. He writes down the code once and repeats it over and over again. programmer same code again and again can use. Which saves time and the program is not complex Would have been

syntax –

FunctionType FunctionName(parameters)

-

Array - array is a collection of similar data types. They are stored in continuous memory location. It is used to store multiple values in one variable.

syntax –
DataType ArrayName[size_of_array];

Pointer - Pointer is a variable which keeps on containing the memory address. Before using them we have to declare them.

syntax –
datatype *var_name;

Reference – When a variable is declared as a reference, it becomes another name of the variable. We can use either variable name or reference name to refer to the variable.

User-defined Data Types

The data types user They are defined by are called user-defined data types. types of which are as follows:-

- Class
- Structure •
  Union •
  Enumeration

Class –

Class is a data type defined by the user in which it has its own data members and member functions. These data members and functions can be used by creating objects of the class.

In simple words, “A class is a blueprint from which objects are created.

Syntax:–
In C++, a class is defined by the ***class*** keyword. class className { // some data // some functions };

-

Structure –

Structure is a collection of variables of different data types. It is used to present a record.

Syntax:–

```
struct address
   { char name[50];
   char street[100];
   char city[50]; char
   state[20]; int
   pin; };
```

Union –

Like Structure, Union is also a user-defined data type. In union, all the members share the same memory location. The size of the union depends on the size of its largest members . **syntax:-**

```
union union-name

{ datatype var1;
datatype var2;
.....
.....
datatype varN; };
```

Enumeration –

enumeration is also a user-defined data type that is used to name integral constants. For this the enum keyword is used.

syntax:–

```
enum State {Working = 1, Failed = 0};
```

It can be used for the days of the week.

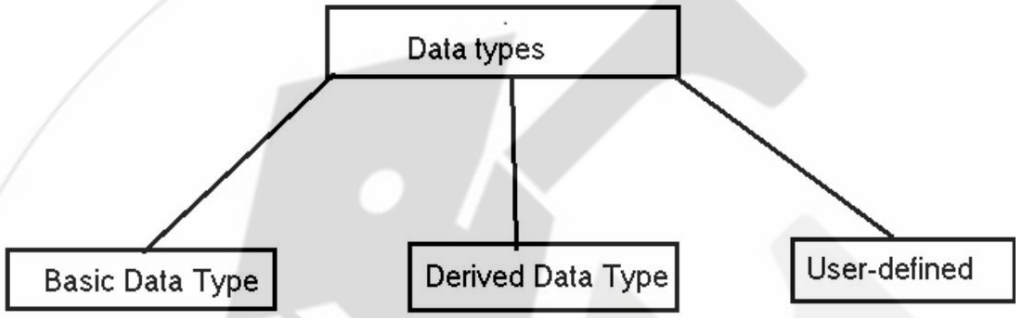
enum ÿÿ C++ program –

```
#include <iostream>  using
namespace std;  enum week
{ Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday };  int main()
{  week day;  day = Friday;  cout << "Day: "  << day+1<<endl;
```

-


```
    return 0;
}
```

This is the output:- Day: 5



Introduction of Class and Object

Class and Object are very important part of OOP.

The concept of OOP is based on Objects and Classes.

There can be many member functions and data members inside the class. to whom through the object access is taken.

The variables that are inside the class are called data members and the functions that are there are called member functions.

for eg. aaa aaa aaaa aa aa aa aaaa aa aa behavior aa properties aaaa aa, aaaa aaaa, aaaa, aaaa aaaa aaaa aaaa aa aaaa aa data members aa member functions aaaa aaaa aaaa aaaa aa |

Their objects are also created with different names for more than one Prat.

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What is class?

Class is like a structure. In which variables (data members) and functions (member functions) are collected at one place. Data and functions are members of the class. Class works to hold the data. Class is the layout of this object.

Defining Class

The class keyword is used to define the class. With this goes the 'Classname'. The first character of the class name can be either Uppercase or Lowercase. but
Having the first letter of the class name in uppercase is called 'Good Programming'.

There are other important parts to the class. Like Luck, **Access Specifier**

Access Specifier / Modifier is used for Access Control.

There are three types of Access Specifiers.

1. private
2. public
3. protected

1. Private: In private, variables are written as members of the class. Instead of private, members of private are written, that is the default private member. private member only works for its class. These are not accessible outside the class. **2. Protected:** The work of protected is similar to that of private. **3. Public:**

The members of public are accessed both inside and outside the class. Data members are also written inside it.

Syntax for Class

```
class Classname{

        data member(s);

        member function(s);
```

```
};
```

For Example

In the example given below, the class name 'Number' and the curly braces have been opened ({) with the keyword 'class'. With this, data members and member functions have been defined. After this curly brace close (}) is followed by semicolon (;) at the end.

```
class Number{


private:

        int a;              //data member

public:

        getdata(); //member function

};
```

What is Object?

Objects are like variables. It is

more objects. Object of class istakkittenasinsidetamypin()afunditionasClgasedmemailelesfu(objects)vitto thejectass(baccessor operator

access is taken.

Syntax for Object Declaration

Like variables are declared, similarly object is declared by giving classname as a data type.

```
classname object(s);
```

-

For Exmaple

```
Number n1, n2; // n1 and n2 is a objects of class Number
```

Accessing Class Members

operator (.) is required. To do this, object and member functions are used. Along with the data of its class, access access

Syntax for Accessing Class Members

```
object_name.member_function();
```

For Example

```
n1.getdata();
```

Full Example for Class and Object

Source Code :

```
#include <iostream.h>

using namespace std;


class Number{


private:

        int whether;


public:

        getdata(){

        cout <<"Enter value of num : ";
```

```
        cin>>num;
}
        putdata(){
        cout<<"Value of num : "<<num;
}
};
int main(){

Number n1;
n1.getdata();
n1.putdata();

return 0;
}
```

Output :

```
Enter value of num : 5
Value of num : 5
```

Introduction to C Programming

C is a general purpose high level programming language used to develop portable applications and firmware. It is basically designed to develop system software and operating system. C was developed by Dennis Ritchie at Bell Labs in the 1970s. The first major application of C was the UNIX Operating System. The main features of C include low-level access to memory, simple set of keywords, and clean style. Because of these things, C language is a suitable language for operating system development. Many languages developed after C follow the syntax of C language like PHP, Java, JavaScript etc.

-

C/C++

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C pppppppppp pppppppppp

1. C AAA AAA AAAAA AAAAA AAA keywords AAA AAA. AAAAA control primitives AAA AAA AAA if, for, while, switch AAAAA
2. C AAA AAA logical AAA mathematical operators AAA AAA AAAAA bit manipulators aa aaaa aaaa
3. C AAA functions AAA return values AAA AAAAA AAAAA AAA AAA AAA
   AAAA A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A

A A A Aa

A sample program in C–

```
#include <stdio.h>

void main()

{

    printf("Hello, ComputerHindiNotes.com!");

}



Output- Hello World!
```

Now let us try to know what is the meaning of all the lines we have written in the above program and before knowing the meaning it is very important to know some things

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-

Now we will try to understand what is the meaning of each line written in the program.

#include<stdio.h>

In the above line # stands for pro processor, it means that the compiler will process the pro processor wise command first before processing any other command. This line stdio.h is a header line, in which the definition of the functions used in this program is written.

void main()

It is a function, whenever we execute any program, the operating system always searches for the main function in the code of that program and then the program starts executing from there. So no matter in which programming language you make programs, there must be a main function in all of them.

printf("Hello, ComputerHindiNotes.com!");

This is a function through which we can display a message on the computer screen. In this printf function we have sent an argument which is a message.