



Mo Tu We Th Fr Sa Su

Date / /

Evolution of OOPs :-

- • Initially for writing small and simple programs, Machine language was introduced.
- Next came the Assembly language which was used for designing larger programs.
- Both machine and Assembly languages are machine dependent.
- Next came Procedural Programming Approach which enabled us to write larger and hundred lines of codes.
- Then in 1970, Structured Programming Approach was developed for ~~des~~ writing medium sized programs.
- In 1980, size of programs increased rapidly, therefore, new approach known as OOP was invented.



Mo Tu We Th Fr Sa Su

Date / /

OOPs

- OOPs was introduced to overcome the drawbacks of procedural programming language such as lack of reusability and maintainability.
- Basically, OOPs is a way of solving complex problems by breaking them into smaller problems using objects.
- In OOPs we write programs using classes and objects with the help of OOPs features such as abstraction, encapsulation, inheritance and polymorphism.
- Data of an object can only be accessed by ^v which is associated with it. ^{that function}



Mo Tu We Th Fr Sa Su

Date / /

Q. Communication between objects
is done through objects.

Advantages of OOPs :-

- Emphasis on data rather than procedure
- Programs are divided into entities known as objects.
- Even In data structure, Function that operate on data of an objects are tied together.
- Data is hidden and cannot be accessed by external functions.



Mo	Tu	We	Th	Fr	Sa	Su
----	----	----	----	----	----	----

Date / /

1) OOPs Concepts

- ↳ Class
- ↳ Objects
- ↳ Encapsulation
- ↳ Abstraction
- ↳ Polymorphism
- ↳ Inheritance

* Objects :-

- An Object is an instance of a class. When a class is defined, no memory is allocated but when it is initiated, memory is allocated.
- Objects are the basic run time entities of any object oriented system.



Mo Tu We Th Fr Sa Su

Date / /

* Class :-

- It is a user-defined data type, which holds its own data members and member functions, which can be accessed and used by creating an object of that class

* Encapsulation :-

- It is the process of binding data members (variables, properties) and member functions (methods) into a single unit
- This is to avoid the access of private data members from outside the class.



Mo Tu We Th Fr Sa Su

Date / /

* Abstraction :-

- Data abstraction is one of the most essential and important features of object oriented programming in C++
- Abstraction means displaying only essential information and hiding the details or implementation.

* Polymorphism :-

meaning
↓

- It is a greek word \rightarrow having more than one form
- It can be define as the ability of a message to be displayed in more than one form.



Mo Tu We Th Fr Sa Su

Date / /

* Inheritance :-

The capability of a class to derive properties and characteristics from another class is called Inheritance.

Sub Class :- The class that inherits properties from another class is called Sub class or Derived Class.

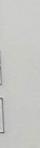
Super Class :- The class whose properties are inherited by sub class is called Base Class or Super class.



Date / /

Functional Programming

- 1) The FPL supports immutable data. (values and data can't be changed)
- 2) FPL supports the Declarative Programming Model.
- 3) FPL focuses on the "What we are doing"
- 4) The methods of FPL will not produce any side-effects.
- 5) FPL follows parallel programming.
- 6) for the flow control, we do function calls function calls with recursion.
- 7) for iteration of data collection FPL we "Recursion" concept.
- 8) In FPL, execution of the statements in the order is not important.
- 9) FPL supports "Abstraction over Data" and "Abstraction over Behavior".



Date / /

Object-Oriented Programming

- 1) OOP uses mutable data. (values and data can be changed)
- 2) OOP supports the imperative Programming Model
- 3) OOP focuses on the "How we are doing"
- 4) Methods of OOP can produce the side-effects.
- 5) OOP does not work on parallel prog.
- 6) for the flow control, OOP supports use of the loops and conditional statement.
- 7) OOP uses the "Loop" concept for the iteration of Data collection.
- 8) In OOP, execution of the statements in the order is very important
- 9) OOP supports Only "Abstraction over Data".



Mo Tu We Th Fr Sa Su

Date / /

Why do we need OOP?

OOP was discovered because limitations were found in earlier procedural programming.

Drawbacks :-

- 1) Every function has complete access to global data.
- 2) The new programmer can easily corrupt the data.
- 3) We can access the data of one function from other since there lack of protection, we can access the data of one function from other.
- 4) In large program it is very difficult to identify what data is being used by the function.
- 5) all functions need to be modified when new data is added.
- 6) Does not solve real world problem very well.