



A comparative study on procedure oriented programming and Object-Oriented Programming

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ABSTRACT

The meaning of the term object oriented is examined in the context of the general - purpose programming language C++. This language supports data abstraction, object – oriented programming and traditional programming techniques. This language is discussed eight paradigms are discussed: Procedural, data hiding, data abstraction, Inheritance, polymorphism, Message passing and dynamic binding. It is a methodology which is essentially centered on the way object collaborate to convey and share the data.

Keywords

C++, Inheritance, polymorphism, data abstraction, dynamic binding

INTRODUCTION

OOP is a programming paradigm based on the concept of objects, which may contain data, in the form of fields often known as attributes, and code in the form of procedures often known as methods.

In OOP, computer programs are designed by making them out of objects that interact with one another. There is a significant diversity of OOP languages but the most popular ones are class – based, meaning that objects are instances of classes which typically also determine their type.

The most widely used programming languages (such as C++, object Pascal, Java, Python etc) are multi – paradigm programming languages that support OOP to a greater or lesser degree, typically in combination with imperative, procedural programming.

HISTORY OF OOP

The idea of object – oriented programming gained momentum in the 1970s and in the early 1980s Bjorn stroustrup integrated object-oriented programming into the C language. The resulting language was called C++ and it became the first object oriented language to be widely used commercially.

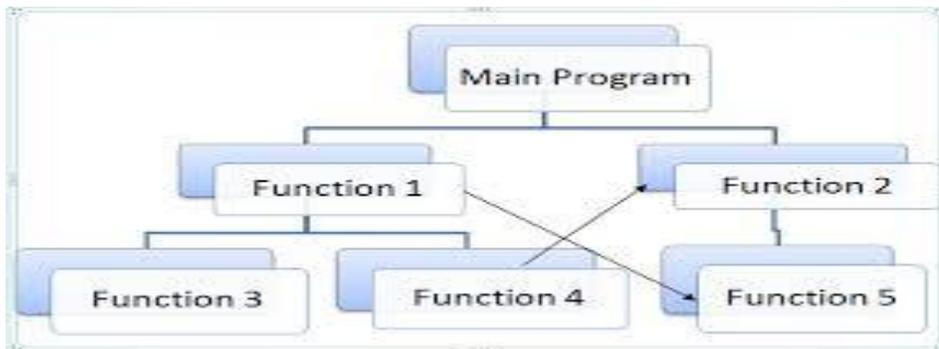
In the early 1990s a group at sun led by James Gosling developed a simpler version of C++ called Java that was meant to be a programming language for video – on – demand applications.

COMPARISON BETWEEN PROCEDURE ORIENTED AND OOPS

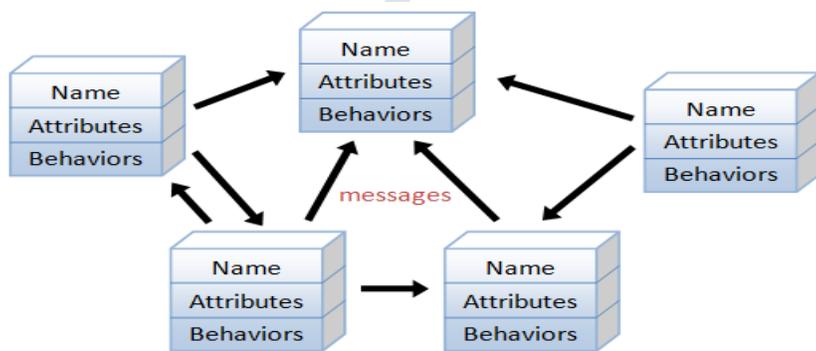
	Procedure Oriented Programming	Object oriented Programming
Divided into	In POP, program is divided into small parts called functions.	In OOP, program is divided into parts called objects.
Importance	In POP, importance is not given to data but to functions as well as sequence of actions to be done.	In OOP, importance is given to the data rather than procedures or functions because it works as a real world.
Approach	POP follows top down approach.	OOP follows bottom up approach.
Access specifies	POP does not have any access specifier.	OOP has access specifier named public, private, protected etc.
Data Moving	In POP, data can move freely from function to function in the system.	In OOP, objects can move and communicate with each other through member functions.
Expansion	To add a new data and function in POP is not so easy.	OOP provides an easy way to add new data and functions.
Data Access	In POP, most functions uses global data for sharing that can be accessed freely from function to function in the system.	In OOP, data cannot move easily from function to function, it can be kept public or private so we can control the access of data.
Data Hiding	POP does not have any proper way for hiding data so it is less secure	OOP provides data hiding so provides more security.
Overloading	In POP, overloading is not possible.	In OOP, overloading is possible in the form of function overloading and operator overloading.

Example	C,VB,FORTRAN,PASCAL	C++,JAVA,VB.NET,C#.NET
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STRUCTURE OF PROCEDURE ORIENTED DIAGRAM



STRUCTURE OF OBJECT ORIENTED DIAGRAM



An object-oriented program consists of many well-encapsulated objects and interacting with each other by sending messages

FEATURES OF OOPS

- Problems are divided into objects
- It is not possible to access data freely.
- Data hiding is possible.
- It uses bottom – up programming technique.
- It is easy to add new data and functions.
- Object can exchange data through its functions.

BASIC CONCEPTS OF OOPS

Object oriented program development is a new programming style having real world thinking. It is not a programming technique. So each and every programmer has its own way of thinking. To standardize the thinking the following concepts are defined.

1. Objects
2. Classes
3. Data Abstraction
4. Data Encapsulation

- 5. Inheritance
- 6. Polymorphism
- 7. Dynamic Binding
- 8. Message Passing

CONCEPT 1: OBJECT

Objects are the basic unit of OOP. They are instances of class, which have data members and uses various member functions to perform tasks. It is defined as an entity. It may be either physical or logical.

Ex:

Object	Data (Attributes)	Functions
Triangle 	Side a Side b Side c Border color Fill color	Draw Fill Area Move

While representing objects in computer it occupies some memory space and have an associated address. During execution objects can exchange information.

CONCEPT 2: CLASS

It is similar to structures in c languages. It is defined as a collection of objects with same type of data and functions. It is defined as used defined data type but it also contains functions in it. It declares and defines what data variables the object will have and what operations can be performed on the class’s object.

Class classname

<pre> { Declaration of data Definition of functions } </pre>	<table border="1"> <tr><td>Class : Furniture</td></tr> <tr><td>Cost</td></tr> <tr><td>Size</td></tr> <tr><td>Weight</td></tr> <tr><td>Colour</td></tr> <tr><td>Buy</td></tr> <tr><td>Sell</td></tr> <tr><td>Repair</td></tr> </table>	Class : Furniture	Cost	Size	Weight	Colour	Buy	Sell	Repair
Class : Furniture									
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CONCEPT 3: DATA ABSTRACTION

Abstraction refers to showing only the essential details and hiding the other details. It is a named collection of data that describes a data object in a class. Class is also called the abstract data type because classes use the principle of data abstraction. Classes can provide methods to the outside world to access. This can be done using access specifier.

CONCEPT 4: ENCAPSULATION

It can also be said data binding. It is all about binding the data variables and functions together in class. It is a technique used to protect the information in an object from other objects. The other objects and programs cannot access the data in an object directly. This concept is called data encapsulation or data hiding.

CONCEPT 5: INHERITANCE

It is the process of creating a new classes from the existing classes. The new classes are called derived classes. The existing classes are called base classes. It is basically a method which provides a way that capabilities and properties from one class to come into another class. This technique provides code reusability to the programmers. We can form a new class from an existing class, where the existing class contains some properties or methods that also exist in the new class. Here the new class is called the derived class , and the existing class that is the class from which the new class is derived is called as base class.

**CONCEPT : 6 POLYMORPHISM**

It is a technique used to write more than one function definition with same function name. The functions may be in the same class or in different derived classes. Polymorphism is the ability for a message or data to be processed in more than one form. It is an important concept of object oriented programming which supports the capability of an object of a class to behave differently in response to a message or action.

CONCEPT 7: DYNAMIC BINDING

Binding is defined as the connection between the function call and its corresponding program code to be executed. It is also known as late binding. It is generally use with polymorphism and inheritance.

There are two ways of binding. They are

- i) Static binding
- ii) Dynamic binding

In static binding, the binding occurs during compilation time.

In dynamic binding, the binding occurs during run time.

CONCEPT 8: MESSAGE COMMUNICATION

It is defined as a process of sending request to execute a function for an object. The general form is

Objectname. Message(information);

Objects can communicate with each others by passing message same as people passing message with each other.

CONCLUSION

In our opinion OOPS classes tends to be in generalized form which make relations among classes becomes artificial at times. The object oriented programs are tricky in design. So to program with OOPS one needs to have proper design skills, programming skills. With the use of feature like class, objects, encapsulations, polymorphism, inheritance, and abstraction it can be seen that development of software is increase by using these capabilities.

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