White Paper

(Object Oriented Programming)

Introduction:

Hello, I am Pratiksha Kamble from Mumbai. I am working as a Python Developer in Tata Consultancy Services(TCS). This white paper is for everyone those who wanted to start doing programming in python or any other programming languages and they don't have any prior knowledge in object-oriented programming (OOP).Here, my focus is to explain OOP's concept in simpler way. So, that anyone can understand it easily.

Why do you need to know this?

Have you picked Python to be your first programming language? Do you want to be a hot-shot developer who works on giant enterprise systems spanning hundred-thousand lines of code or more?

Unless you learn to embrace Object-Oriented Programming fully, you will be well and truly lost.

Object-Oriented Programming (OOP)

Object-oriented programming (OOP) is a programming language model in which programs are organized around data, or objects, rather than functions and logic. An object can be defined as a data field that has unique attributes and behaviour. Examples of an object can range from physical entities, such as a human being that is described by properties like name and address, down to small computer programs, such as widgets. This opposes the historical approach to programming where emphasis was placed on how the logic was written rather than how to define the data within the logic.

Fundamentals of Object Oriented Programming:

Class:

We can think of class as a sketch (prototype) of a house. It contains all the details about the floors, doors, windows etc. Based on these descriptions we build the house. House is the object.

As, many houses can be made from the same description, we can create many objects from a class.

Example

Create a class named PenClass, with a property named x:

```
class PenClass:

color="This is blue pen."
```

Object:

When class is defined, only the specification for the object is defined; no memory or storage is allocated.

To use the data and access functions defined in the class, you need to create objects.

Example

Create an object named p, and print the value of color:

```
p = PenClass ()

print(p.color)
```

Principles of OOP

Object-oriented programming is based on the following principles:

- **Encapsulation-** The implementation and state of each object are privately held inside a defined boundary, or class. Other objects do not have access to this class or the authority to make changes but are only able to call a list of public functions, or methods. This characteristic of data hiding provides greater program security and avoids unintended data corruption.

- **Abstraction-** Objects only reveal internal mechanisms that are relevant for the use of other objects, hiding any unnecessary implementation code. This concept helps developers make changes and additions over time more easily.

- **Inheritance-** Relationships and subclasses between objects can be assigned, allowing developers to reuse a common logic while still maintaining a unique hierarchy. This property of OOP forces a more thorough data analysis, reduces development time and ensures a higher level of accuracy.

- **Polymorphism-** Objects are allowed to take on more than one form depending on the context. The program will determine which meaning or usage is necessary for each execution of that object, cutting down on the need to duplicate code.

Future Scope:

Object oriented programming is base of many high level programming languages like C#,Java,Python etc. If you will have clear understanding of object oriented programming concept then you can learn any programming language.

Refrences:

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- http://ee402.eeng.dcu.ie/introduction/chapter-1---introduction-to-object-oriented-programming
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Feedback:

With the help of this white paper now you have basic idea of object oriented programming.

If you have any query, you can contact me on my email – kpratiksha055@gmail.com

Thank You!

- **Pratiksha Bhagwan Kamble.**