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REPLACE OBJECT ORIENTED PROGRAMMING (OOP) IN PYTHON PROGRAMMING LANGUAGE

Rajabov Azizbek Ravshan o‘g‘li
Asia International University, teacher of the "General Technical Sciences" department

Abstract: This article introduces the concept of object-oriented programming (OOP) and its role in the Python programming language. The article introduces global and local developments and legislation in the field of programming, the theoretical part discusses the basic principles and practical importance of OOP, and the conclusion discusses the benefits and future of this approach. At the end of the article there is a list of used literature

Keywords: Python, object-oriented programming, OOP, encapsulation, inheritance, polymorphism, abstraction, software, IT news .

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News and changes in programming are happening every day. Today, approaches, methodologies and their rules are being updated rapidly due to developments in digital technologies and software. The IT sector of Uzbekistan is not exempt from such updates. Today, Uzbekistan is adopting new laws and regulatory documents related to the development of digital economy, support of talented young people in the field of information technologies, organization and programming of IT parks. Especially in programming, object-oriented programming (OOP) and its practical applications are gaining a lot of attention among IT professionals.

As an example, in accordance with the Decree of the President of the Republic of Uzbekistan dated January 28, 2022 "On the Development Strategy of New Uzbekistan for 2022-2026" No. PF-60 , as well as information and communication technologies implementation of priority tasks for bringing the field to a new level is set as a goal

In the world, the principles of OOP programming are gaining importance in the creation of artificial intelligence, automated systems, games and other types of

software products. IT giants such as Google, Microsoft, Amazon, and Facebook are paying great attention to the application of OOP principles in programming because it simplifies the software development process and enables better problem solving. In Uzbekistan, the IT sector is also developing, adopting these principles, and as an important part of the digital economy, there is a need to use modern approaches to programming.

. Object-oriented programming (OOP) is a software development approach in which program components are defined as objects and interact with each other. Programming with OOP becomes more convenient, understandable and extensible. The four main principles of OOP are: **Encapsulation** , **Inheritance** , **Polymorphism** , and **Abstraction** .

1. Encapsulation (Encapsulation)

Encapsulation plays a very important role in the security of software. It combines all the data (properties) and behavior (methods) of the object in one place, that is, in one class. Through encapsulation, the object's data is protected from the outside world and accessible only through the object's methods. This principle ensures that data and functions are kept in one place, making code reuse easier and code structure more robust.

For example, when creating a car model, it is possible to hide its internal information (properties) and ensure that they are used only by the necessary methods. Accessing this data through methods rather than directly helps prevent the user from entering incorrect data and making unexpected errors.

2. Inheritance

Inheritance is one of the important principles in OOP, which allows the properties and methods of one class to be transferred to another class. This reduces rewriting of application code and ensures code reuse. Inheritance makes it possible to use all the features of an existing class when creating a new class, which ensures code integrity and makes it easier to update the program.

For example, there could be a public class called "Animal" that has public properties and methods (such as "eat" or "walk"). Special classes such as Cat and Dog can

inherit from the Animal class, adding their own properties and inheriting common properties and methods.

3. Polymorphism

Polymorphism is one of the most powerful principles of OOP, allowing a method or operator with the same name to behave differently in different classes. This principle ensures different behavior of different objects with the same interface. An important advantage of polymorphism is that it makes software extensible and allows adding new functionality without changing the code.

For example, the method called "Drawing" is used to calculate the area of a circle in the "Circle" class, and it is used to calculate the area of a rectangle in the "Rectangle" class. Although the method name is the same in both cases, it behaves differently in each class.

4. Abstraction (Abstraction)

Abstraction allows highlighting only important and necessary features and functions in complex systems and hiding unnecessary details. Abstraction simplifies software and makes it easier to manage. This principle hides redundant information and reduces system complexity by providing users or developers with the functionality they need.

For example, the "Car" object has parts visible to the user (wheels, color, etc.) and internal parts (engine, transmission). The user works only with the necessary features and is not interested in the internal working mechanism (details) of the car.

Practical importance of OOP principles

Each of these four principles is important in programming, making software easier to manage, making the programming process more efficient, and improving the structure of the software code. OOP principles are widely used in modern software development because they make software robust, extensible, and flexible. Along with the development of the IT sector in Uzbekistan, the principles of OOP are

gaining more attention, which allows programmers and IT specialists to create better and more convenient software .

Summary

The object-oriented programming (OOP) approach in the Python programming language simplifies software management, makes the programming process efficient, and enables code reuse. OOP principles are important in solving complex problems in software product development. Nowadays, innovations in the field of programming in Uzbekistan and around the world and new legal norms require further study and practical application of the OOP approach. The skills of IT professionals can be enhanced by deep learning and practical application of OOP principles.

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