**Java OOPs**

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## **1. What is OOPs?**

Object Oriented Programming is a programming paradigm that allows you to model real world entities as objects and define their behaviour through methods and attributes. Oops promote modularity, reusability and maintainability of code.

### # Benefits of OOPs

1. Modularity: - Breaks complex problem into manageable parts.
2. Reusability: - By use of inheritance.
3. Encapsulation: - Hide internal details of objects, making code more robust and secure.
4. Code readability: - Makes code easier to read.
5. Maintenance: - Easier to modify code as changes in one part of codebase have limited impact on other parts.
6. Collaboration: - Teams can work concurrently on different class or modules.
7. Scalability: - You can create new class or extend existing class without disrupting existing code.

### # Main features of OOPs

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| --- | --- |
| **Encapsulation** | Bundling data (attribute) and methods that operate on the data into a single unit (object) while hiding internal details.  E.g. Smartphone has various components like processor, memory, camera and battery encapsulated with device’s outer shell. |
| **Abstraction** | Abstraction simplifies complex systems by showing essential details while hiding unnecessary complexities.  Abstraction is about expressing external simplicity while encapsulation is about hiding internal complexity.  E.g. For smartphones users have button and touchscreen to access different features is example of abstraction. |
| **Inheritance** | Creating new classes by inheriting attributes and methods from existing ones, promoting code reuse and hierarchy.  E.g. Car, bike, truck can extend features of Vehicle class. |
| **Polymorphism** | Refers to process by which some code, data, method or object behaves differently under different conditions.  E.g. A person can be sometimes a father and sometime a employee. |

## **2. Basic Terminologies**

Object Oriented Programming is a programming paradigm that allows you to model real world entities as objects and define their behaviour through methods and attributes. Oops promote modularity, reusability and maintainability of code.

### # Benefits of OOPs