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💡 **Programming Tip - Design Patterns**

🔥 **Design Patterns** are established solutions to recurring problems in software development. Essentially, they are ***blueprints*** or ***templates*** that guide developers in creating flexible, reusable, and maintainable code. While not tied to any specific ***programming language***, they often align with ***object-oriented principles***.

🏷️ **Types of Design Patterns**:

Design Patterns are typically categorized into three main groups:

1️⃣ **Creational Patterns**: These patterns deal with object creation mechanisms, trying to create objects flexibly.

Ex: ***Singleton***, ***Factory Method***, ***Abstract Factory***, ***Builder***, ***Prototype***

2️⃣ **Structural Patterns**: These patterns deal with how classes and objects are composed to form larger structures.

Ex: ***Adapter***, ***Decorator***, ***Bridge***, ***Composite***, ***Proxy***, ***Facade***, ***Flyweight***

3️⃣ **Behavioural Patterns**: These patterns are concerned with the interaction and assignment of responsibilities between objects.

Ex: ***Observer***, ***Chain of Responsibility***, ***Command***, ***Interpreter***, ***Strategy***, ***Mediator***, ***Template Method***, ***Memento***, ***Iterator***, ***State***, ***Visitor***

✨ **Benefits of Using Design Patterns**:

✅ **Enhanced code clarity**: Patterns provide a shared language among developers, improving code comprehension.

✅ **Enhanced code reusability**: Patterns offer proven solutions that can be applied to different projects.

✅ **Increased flexibility**: Design patterns promote modular and adaptable code.

✅ **Better maintainability**: Well-structured code using patterns is easier to modify and extend.

🧢 **Common Challenges**:

🔺**Overuse**: Using patterns for every problem can lead to overly complex code.

🔺**Misapplication**: A thorough understanding of a pattern is crucial before implementation.

🔺 **Adaptability**: Patterns are a starting point and should be adapted to your specific needs.

❓ How many ***design patterns*** have you used so far? Comment below 👇

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