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Introduction to Creational Patterns

Mastering Creational Patterns for Effective Object Creation

DEFINITION

> Creational patterns are design patterns that deal with object creation mechanisms. They help ensure that objects are created in a flexible and efficient manner.

KEY CONCEPTS

Singleton Pattern

Ensures a class has only one instance and provides a global point of access.

Factory Method

Defines an interface for creating objects but allows subclasses to alter the type of created objects.

Abstract Factory

Provides an interface for creating families of related or dependent objects without specifying their concrete classes.

Builder Pattern

Separates the construction of a complex object from its representation, allowing the same construction process to create different representations.

Prototype Pattern

Creates new objects by copying an existing object, known as the prototype.

EXAMPLES

→ Using Singleton for database connections to ensure only one connection exists.

→ Applying Factory Method to create different types of user notifications (email, SMS).

→ Implementing Builder Pattern to construct a complex meal with various components.

MEMORY TIPS

★ Think of 'S' in Singleton as 'Single' instance.

★ Factory Method: 'Create' with a 'Method' to remember the process.

★ Builder Pattern: Visualize building blocks assembling a structure.

COMMON MISTAKES

✗ Confusing Singleton with multiple instances.

✗ Overusing Factory Method when simpler solutions exist.

✗ Neglecting to define clear interfaces in Abstract Factory.

QUICK RECAP

Creational patterns streamline object creation, enhancing flexibility and efficiency. Key types include Singleton, Factory Method, and Builder. Understanding these patterns helps in designing robust software architectures.