CSCI 253

Object Oriented Design:
Creational Patterns
George Blankenship

Creational Patterns   George Blankenship   1

Overview

Creational Patterns
- Singleton
- Abstract factory
- Factory Method
- Prototype
- Builder

Structural Patterns
- Composite
- Façade
- Proxy
- Flyweight
- Adapter
- Bridge
- Decorator

Behavioral Patterns
- Chain of Respons.
- Command
- Interpreter
- Iterator
- Mediator
- Memento
- Observer
- State
- Strategy
- Template Method
- Visitor

Creational Patterns   George Blankenship   2

The Elements of a Design Pattern

- The Factory Pattern is used to choose and return an instance of a class from a number of similar classes based on data you provide to the factory.
- The Abstract Factory Pattern is used to return one of several groups of classes. In some cases it actually returns a Factory for that group of classes.
- The Builder Pattern assembles a number of objects to make a new object, based on the data with which it is presented. Frequently, the choice of which way the objects are assembled is achieved using a Factory.
- The Prototype Pattern copies or clones an existing class rather than creating a new instance when creating new instances is more expensive.
- The Singleton Pattern is a pattern that insures there is one and only one instance of an object, and that it is possible to obtain global access to that one instance.

Creational Patterns   George Blankenship   3

Factory Method Questions

- Consider a personal checkbook management program like Quicken. It manages several bank accounts and investments and can handle your bill paying. Where could you use a Factory pattern in designing a program like that?

- Suppose are writing a program to assist homeowners in designing additions to their houses. What objects might a Factory be used to produce?

Creational Patterns   George Blankenship   4

Abstract Factory Questions

- If you are writing a program to track investments, such as stocks, bonds, metal futures, derivatives, etc., how might you use an Abstract Factory?

Creational Patterns   George Blankenship   5

Builder Questions

- Some word-processing and graphics programs construct menus dynamically based on the context of the data being displayed. How could you use a Builder effectively here?

- Not all Builders must construct visual objects. What might you use a Builder to construct in the personal finance industry?

- Suppose you were scoring a track meet, made up of 5-6 different events? Can you use a Builder there?

Creational Patterns   George Blankenship   6