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Development Design Document

Introduction

For computer science 321 at Washington State University, we are tasked with creating a console application in C# that will allow a local company's employees to look up the availability of products and also restock. Within this application, there are products which contains attributes such as a unique ID. There are also different product types like physical and electronic. The three main capabilities this console application must have are: creation of a product, searching of a product, and the restocking of products. OOP principles and design patterns will be utilized and covered in the next section below.

Design Patterns & OOP Principles

Principle/Pattern	Classes Involved	Additional Comments
Polymorphism – GRASP	Product, PhysProduct, ElecProduct	Two specialized products inherit from generic abstract product.
Factory	ProductFactory	Responsible for creating specialized products given certain parameters.
Controller – GRASP	StoreManager	Store manager allows for front end to communicate with the backend and retrieve product information.
Pure Fabrication	XmlProductLoader	Allow products to be saved/loaded
Reflection	ProductFactory	Utilize reflection for the generic creation of specialized sub types.
Indirection	InventoryManager	Remove coupling from the StoreManager and the backend product logic.

Other Design Choices

Some other design choices include the usage of aggregation for the creation of the Store and Inventory managers. A store manager object is only created when a StoreMenu is created, and an inventory object is only created when a store manager is made. Lastly the lifecycle of all these objects ends once the StoreMenu is deleted.

Another design choice was the usage of the base class constructor within the specialized product types. That way we can re-use one constructor each time a specialized product is created.

I also chose to create an inventory.xml file within my file explorer to hold a bunch of physical and electronic products. That way upon instantiation of the app, the user does not have to worry about creating products with different item counts to have an inventory full of products.

Diagrams

