

Abstract Factory

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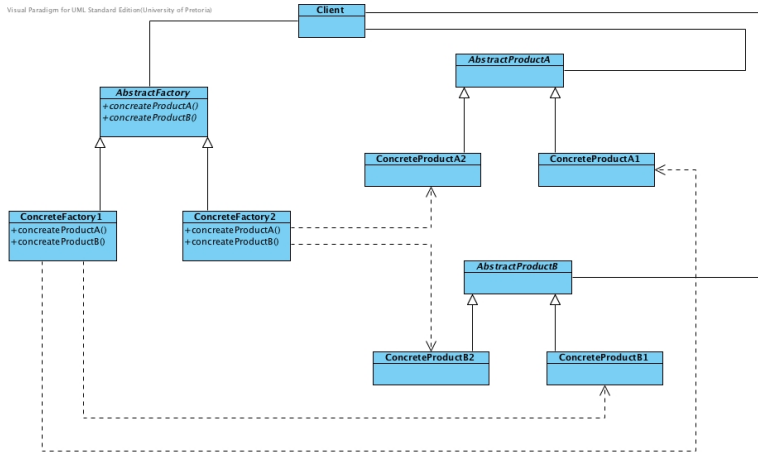
Name and Classification:

Abstract Factory
(Object Creational)

Intent:

“Provide an interface for creating families of related or dependent objects without specifying the concrete classes.” GoF(87)

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- Makes use of factory methods
- Concrete Factory implements the Abstract Factory interface. Abstract Factory therefore does not directly create product
- Concrete Factory creates product

AbstractFactory

- provides an interface to produce abstract product objects

ConcreteFactory

- implements the abstract operations to produce concrete product objects

AbstractProduct

- provides an interface for product objects

ConcreteProduct

- implements the abstract operations that produce product objects that are created by the corresponding ConcreteFactory

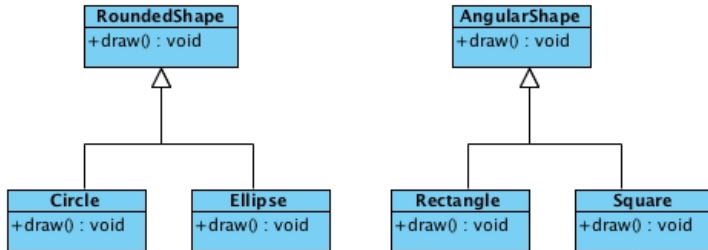
Client

- uses the interfaces defined by
AbstractFactory and AbstractProduct

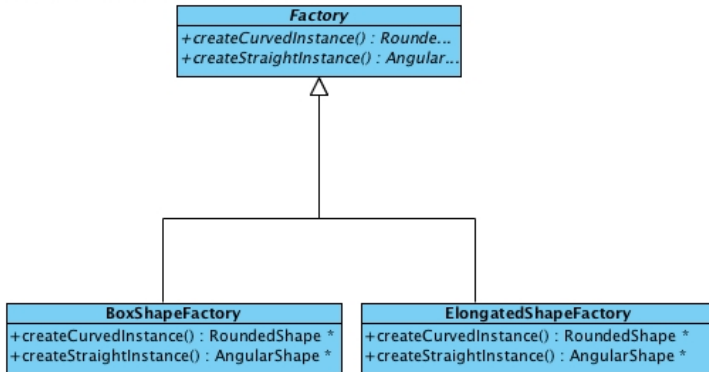
Related Patterns

- **Factory Method** (107): Is used in the implementation of the Abstract Factory
- **Prototye**(117) : May be used by the factory and/or product.
- **Template Method** (325): May be used within the factory and product hierarchies.
- **Singleton**(127): Concrete factories may be implemented so.

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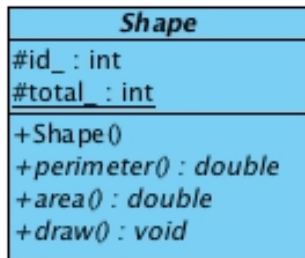
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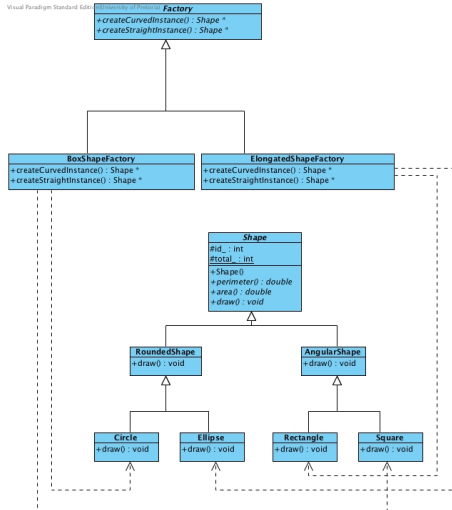


- All shapes have a draw function.
- What if we want to add an area and a perimeter function for each shape?

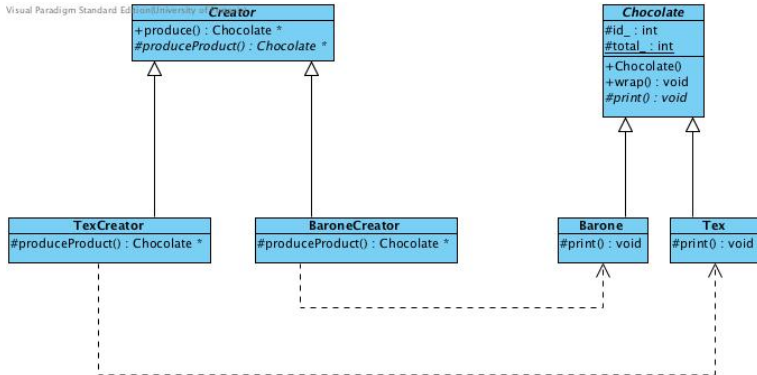
- Solution: Abstract a Shape class and let RoundedShape and AngularShape inherit from it.

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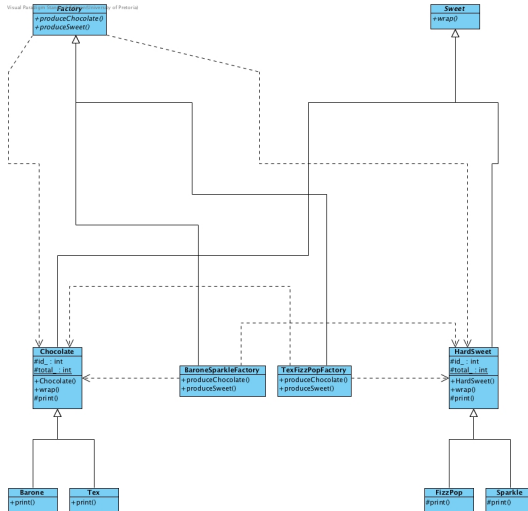




The Factory Method



- Assume we want to produce *hard sweets* such as FizzPops and Sparkles.
- Our Barone factory will begin producing either Barones or Sparkles and our Tex factory both Tex and Fizz Pops.



Identification
Structure
Participants
Related Patterns
Examples

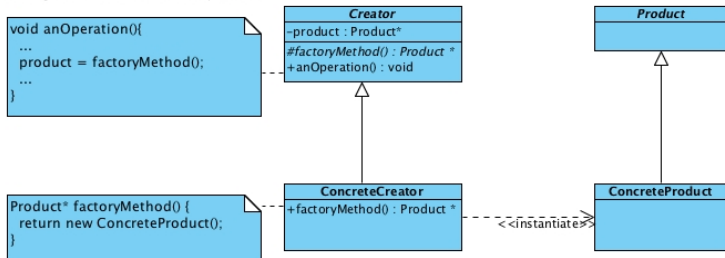
Example 1 - Shapes
Example 2 - Sweets
Example 3 - Designer



You have been appointed as the official designer for Chris Hemsworth. Your commission is to create his formal wear, sports wear and leisure wear. After you have been revived from your fainting spell, you begin working on your business model. Being a good Computer Scientist you immediately think of design patterns and in particular the Factory Method.

Recap, FM structure

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Unfortunately your Factory Method solution is short-lived. You have also been contracted to select his accessories - such as watches, cologne, aftershave, writing instruments etc. as well as his shoes and headwear. You decide to make your selections from catalogues. Your task is to put outfits together for the evening, when playing sport and when relaxing. How would you apply the Abstract Factory to this problem?

Your friend from Open Warehouse Design Emporium selects designs to be sold under their new luxury branding. You are contracted to make your designs available for the majority of the sizes.