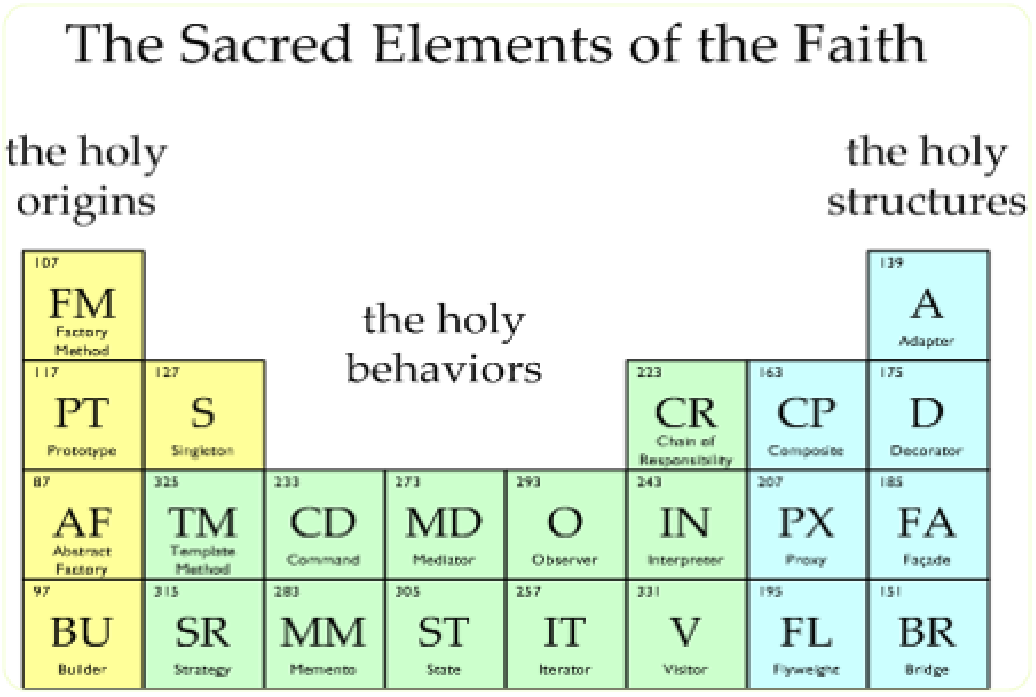
DESIGN PATTERNS



Strategy

"Define a family of algorithms, encapsulate each one, and make them interchangeable. Strategy lets the algorithm vary independently from clients that use it."

Description:

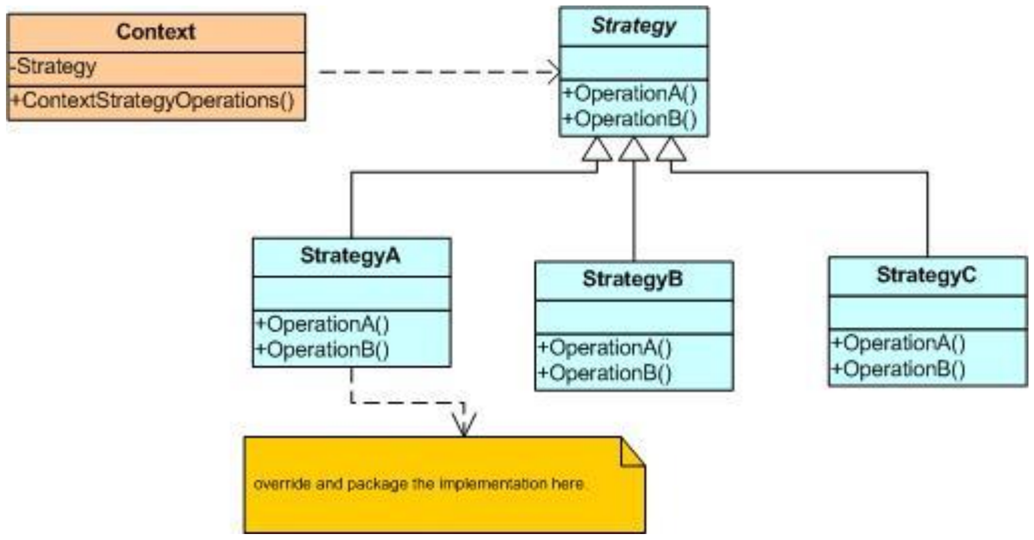
- Like a **Command** design pattern encapsulates some kind of behavior separated in a class.
- Work with different algorithms with different behavior but each of them do same work.
- Includes methods which to be implemented from it inheritors.
- The **strategy** pattern uses composition instead of inheritance.
- Composition means to pass "behavior" as a parameter of method.
- Encapsulates an algorithm inside a class.
- Making each algorithm replaceable by others.
- All the algorithms can work with the same data transparently.
- The client can transparently work with each algorithm.

Examples:

Checker system in BgCoder: Check(ICheckerStrategy checker) - TrimChecker, SortChecker, ExactChecker

Selection of appropriate sorting/searching algorithm - applied as a class implements interface ISortStrategy (e.g.)

UML Diagram:



Some additional information on the Strategy pattern:

[Wikipedia - Strategy Pattern](#).

[Data & Object Factory - Strategy Pattern Overview](#).

Facade

"Provide a unified interface to a set of interfaces in a subsystem. Facade defines a higher-level interface that makes the subsystem easier to use."

Description:

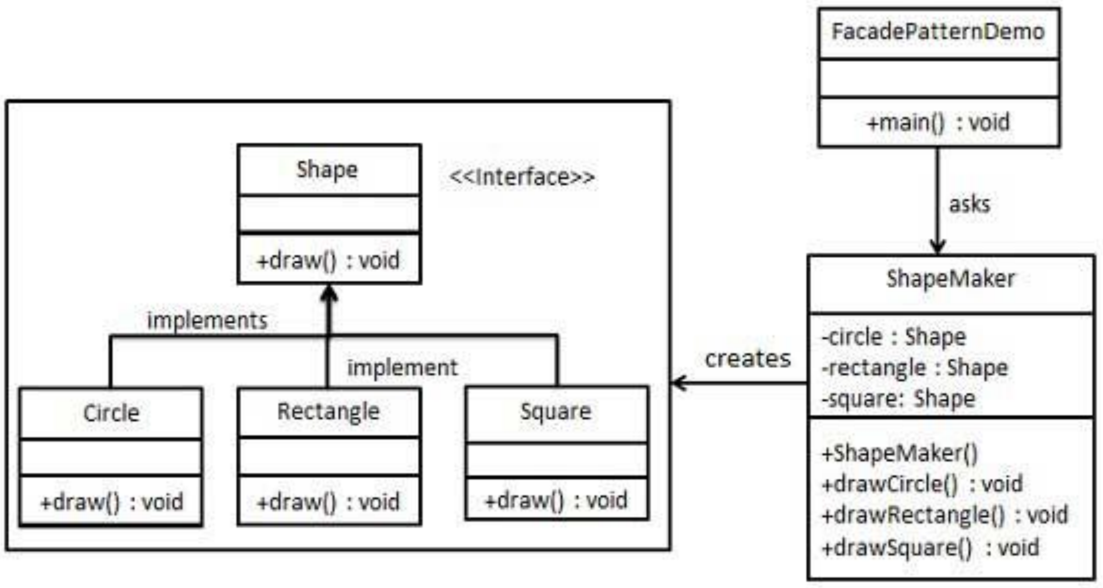
- To separate given functionality and to simplify/avoid subset of classes when want to create/use object.
- To deliver convenient interface from higher level to group of subsystems or single complex subsystem.
- Implementing this pattern our clients can use a simple interface, but if they really need to, can still go straight to the subsystem classes themselves, as opposed to the **Adapter** pattern, where you only talked to the **Adapter**.

Examples:

In C#: File.ReadAllText() method hides complexity (open/dispose stream, reading byte streams, convert them to strings, etc.)

Façade pattern used in many Win32 API based classes to hide Win32 complexity

UML Diagram:



Some additional information on the Facade Pattern:

Wikipedia - Facade Pattern.

Data & Object Factory - Facade Pattern Overview.

Builder

"Separate the construction of a complex object from its representation so that the same construction process can create different representations."

Description:

- When the creational of objects made in steps.
- Creates an object in steps in specific order that object depends on many things.
- Defines a class understands the sequence of this steps.
- Separation of logic and data.

Solve 3 types of problems:

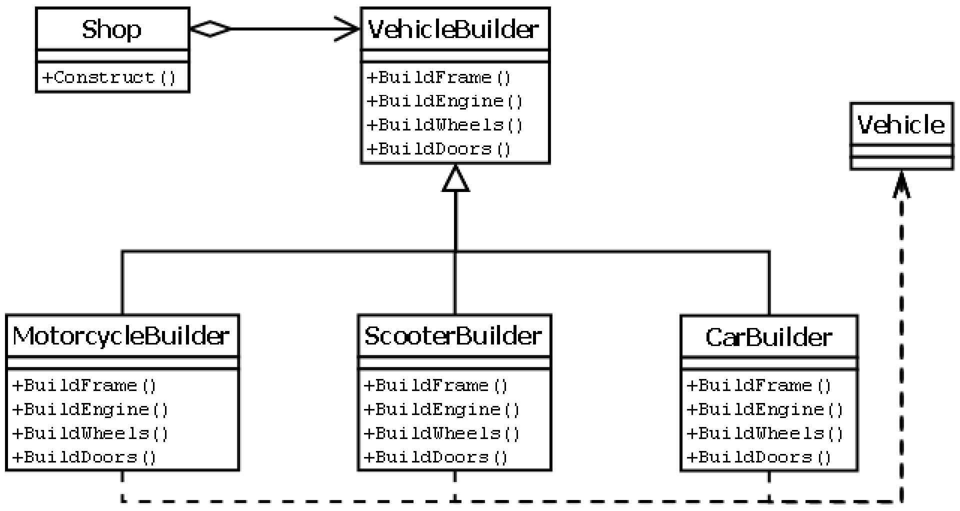
➔ too many parameters
➔ order dependent
➔ different constructions

Examples:

Shop (Director) -> use specific -> Vehicle builder -> to -> Construct a vehicle

1. **Builder** is used by Director (who defines steps how to build a vehicle)
2. **Builder** is implemented by a concrete builder
3. Product is produced by the concrete builder

UML Diagram:



Some additional information on the Builder Pattern:

Wikipedia - Builder Pattern.

Data & Object Factory - Builder Pattern Overview.