Behavioral Patterns

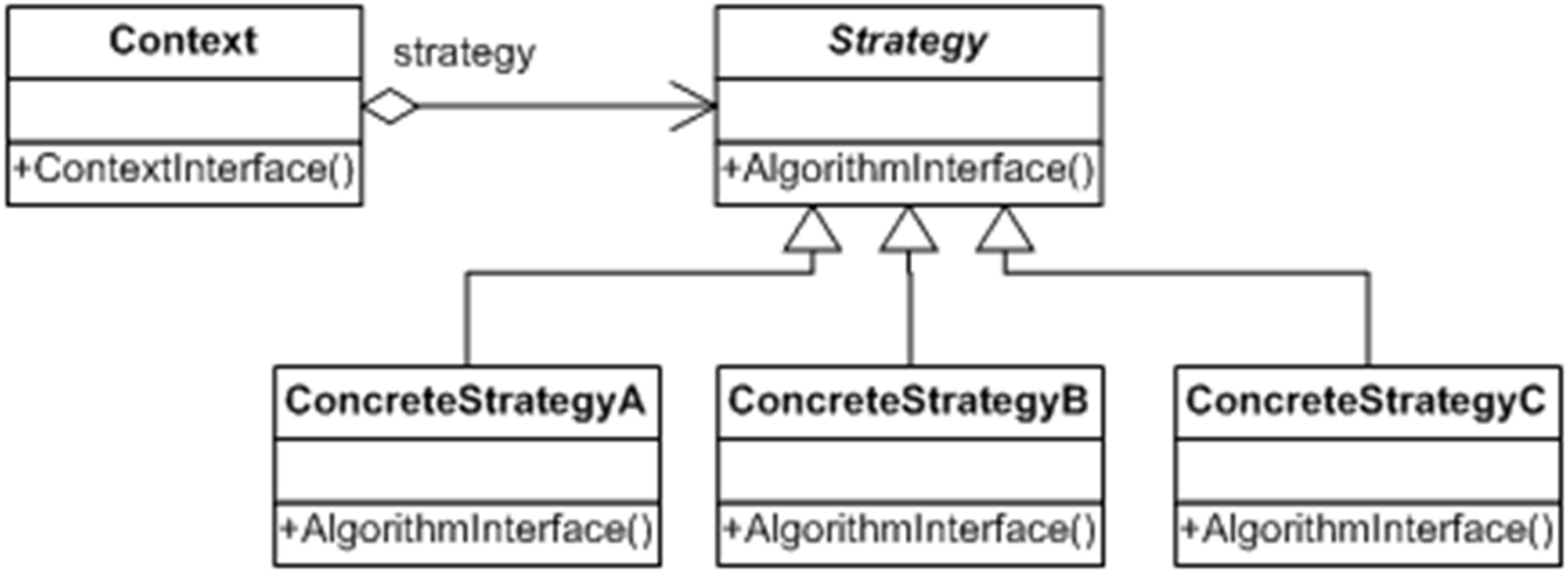
Agenda

- Strategy
- Observer
- Iterator
- Command
- Chain Of Responsibility
- State
- Mediator
- Visitor
- Memento
- Interpreter
- Template Method

Strategy

- Definition:
  Define a family of algorithms, encapsulate each one, and make them interchangeable. Strategy lets the algorithm vary independently from clients that use it.
- Participant
  - **Strategy** – declares an interface common to all supported algorithms. Context uses this interface to call the algorithm defined by a ConcreteStrategy
  - **ConcreteStrategy** – implements the algorithm using the Strategy interface
  - **Context** –
    - is configured with a ConcreteStrategy object
    - maintains a reference to a Strategy object
    - may define an interface that lets Strategy access its data
- Motivation
  - List.Sort(IComparer)
  - List.BinarySearch(IComparer)
  - String.Format(IFormatProvider..)
- Variations – Brain in Object / Strategy as a param to a method

Strategy – Class Diagrams



Strategy

- C# 3.0 features
  - Generic Delegates
    - Func<Tresult>
    - Func<T1, Tresult>
    - Func<T1, T2, Tresult>
    - Func<T1, T2, T3, Tresult>
    - Func<T1, T2, T3, T4, Tresult>
    - Action<T1>
    - Action<T1, T2t>
    - Action<T1, T2, T3>
    - Action<T1, T2, T3, T4>

```
// use one of the 9 pre-defined generic delegates
private Action<int, int, int, int> m_DrawDelegate;
```

  - Anonymous Methods

```
students.Find(delegate(Sudent std){std.ID == 334567896});
```

  - Lambda Expressions

```
students.Find((std) => std.ID == 334567896);
```

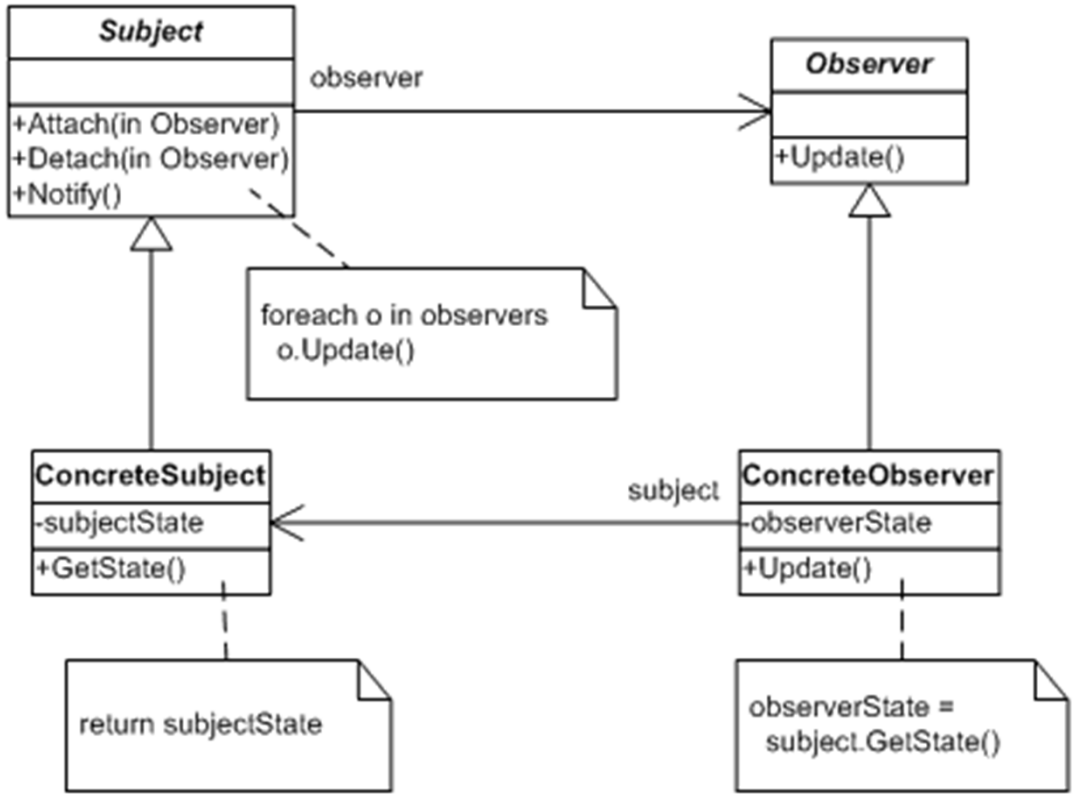
Observer

- Definition:

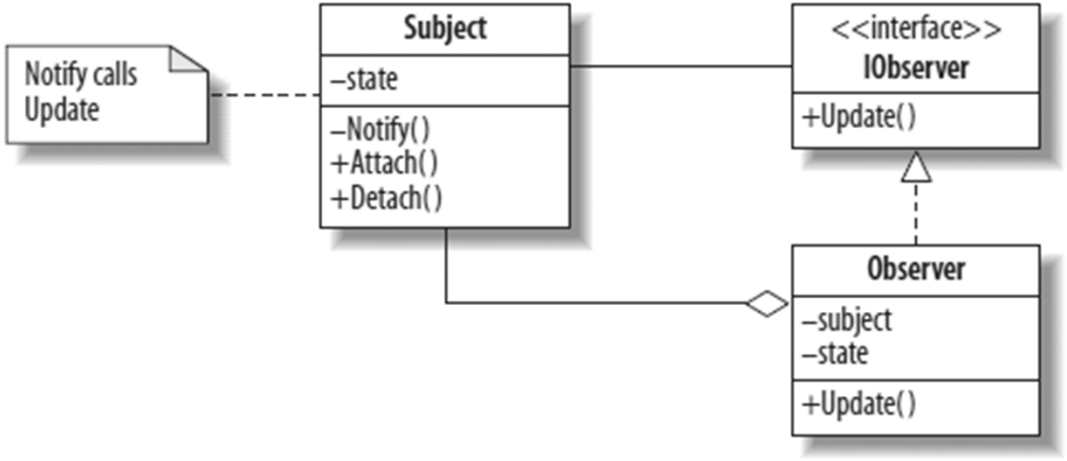
  Define a one-to-many dependency between objects so that when one object changes state, all its dependents are notified and updated automatically.

Observer– Class Diagrams

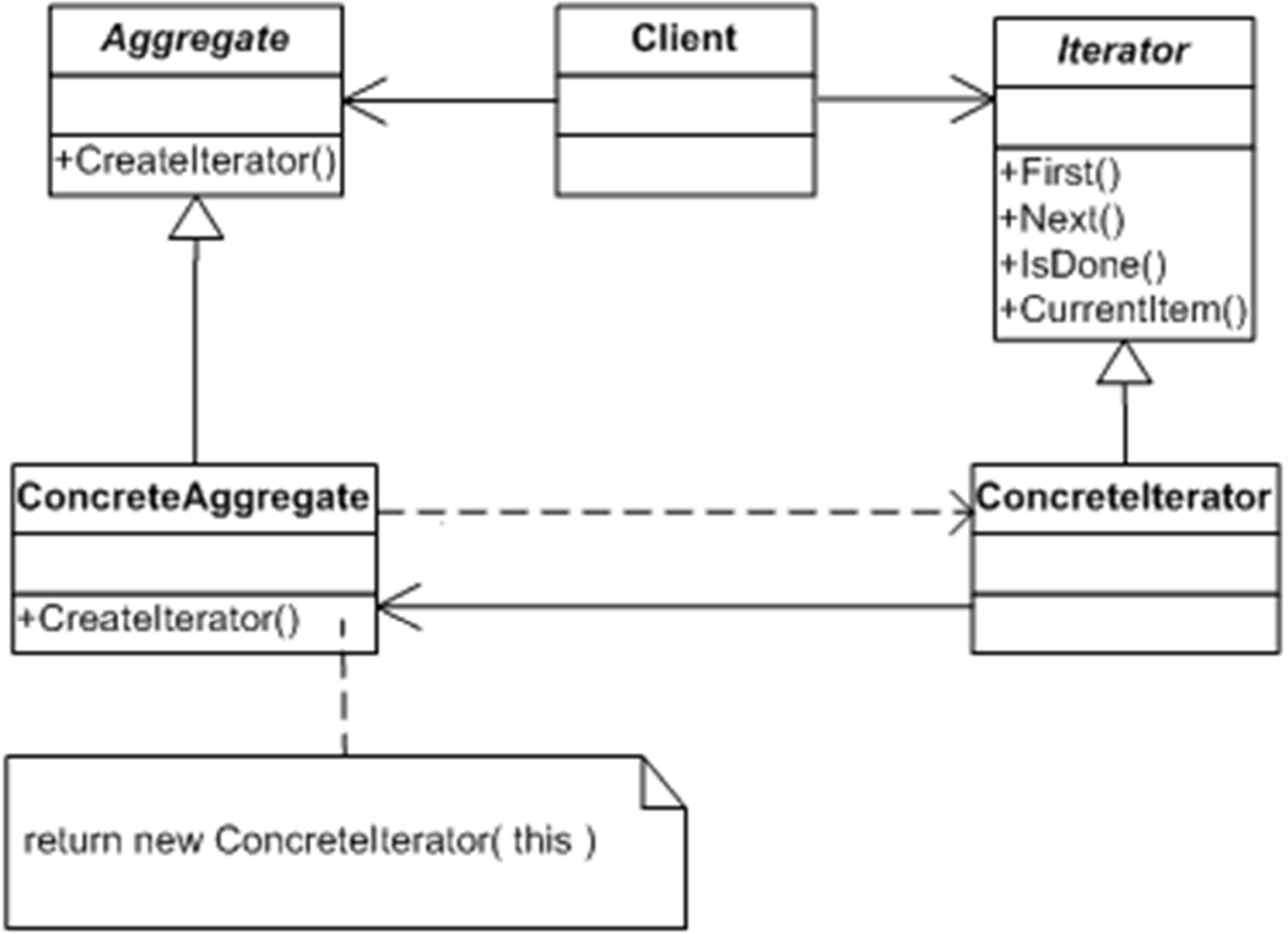
- Gang-Of-4:



- Alternative:



Iterator


Aggregate
+CreateIterator()
Client
Iterator
+First()
+Next()
+IsDone()
+CurrentItem()
ConcreteAggregate
+CreateIterator()
ConcreteIterator
return new ConcreteIterator(this)

Command

- Gang-Of-4: