Nesneye Yönelik Yazılım Mühendisliği (376)

Dr. Öğr. Üyesi Ahmet Arif AYDIN

Builder (Creational) Design Pattern

- Bir nesnenin bir birinden farklı özellikleri içeren ürünlerini alt sınıflar olarak tanımlanan somut oluşturucu (concrete builder) lar kullanılarak oluşturulmasını saglayan yazılım kalıbına builder denir. (*Separates object construction from its representation*)

- Karmaşık nesnenin oluşturulması birbirinden farklı parçaların bir araya gelmesiyle oluşturulmalıdır. *(The algorithm for creating a complex object should be independent of the parts that make up the object and how they're assembled.)*

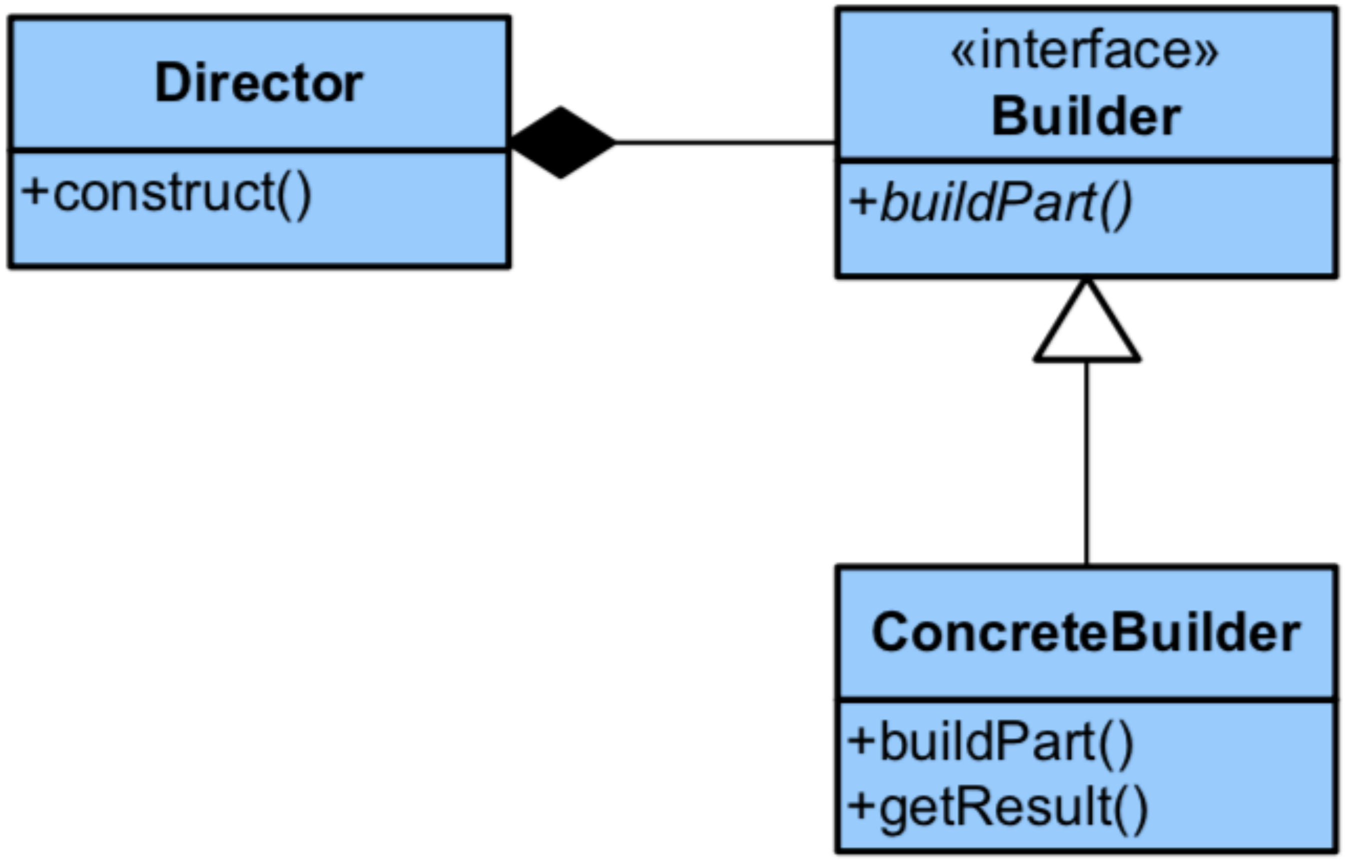
- Oluşturma surecinde özellikleri biribirinden farklı ürünlerin oluşturulmasını sağlamalıdır *(The construction process must allow different representations for the object that's constructed)*

Builder (Creational) Design Pattern

Builder

Type: Creational

What it is:
Separate the construction of a complex object from its representing so that the same construction process can create different representations.



Builder (Creational) Design Pattern

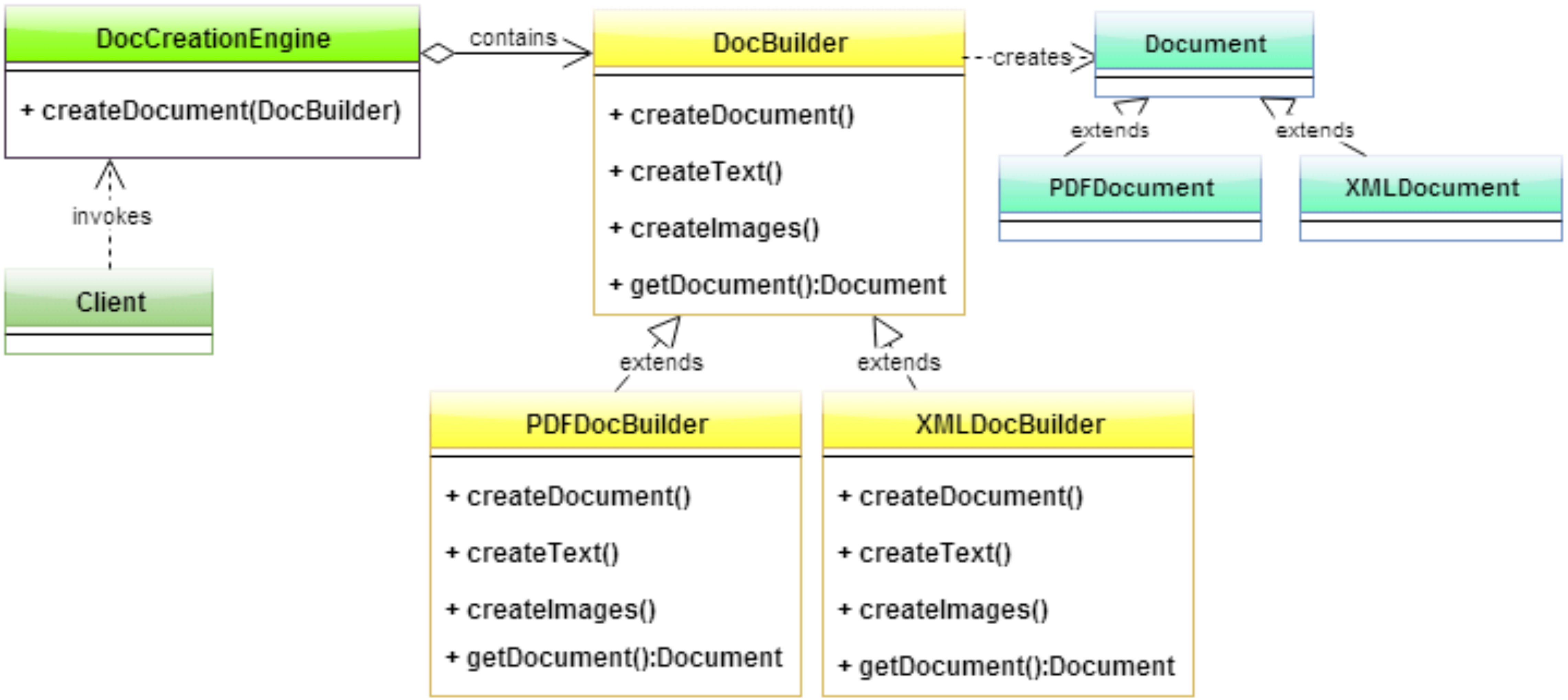
- Aşamali olarak nesnelerın oluşturulmasını Sağlar (Unlike creational patterns that construct products in one shot, the Builder pattern constructs the product step by step under the control of the “director)

- Builder pattern aims to fix problems of Factory and Abstract Factory design patterns when the Object contains a lot of attributes

- There can be more than one such builder classes, each with different implementations for the series of steps to construct the object. Each builder implementation results in a different representation of the object

Builder (Creational) Design Pattern

1. Bir metin belgesini **farklı formatlarda** kayıt işlemini gerçekleştirirken kullanılabilir. (pdf, rtf, doc, docx, jpg , png)



Builder Design Pattern - JavaExample- Class Diagram

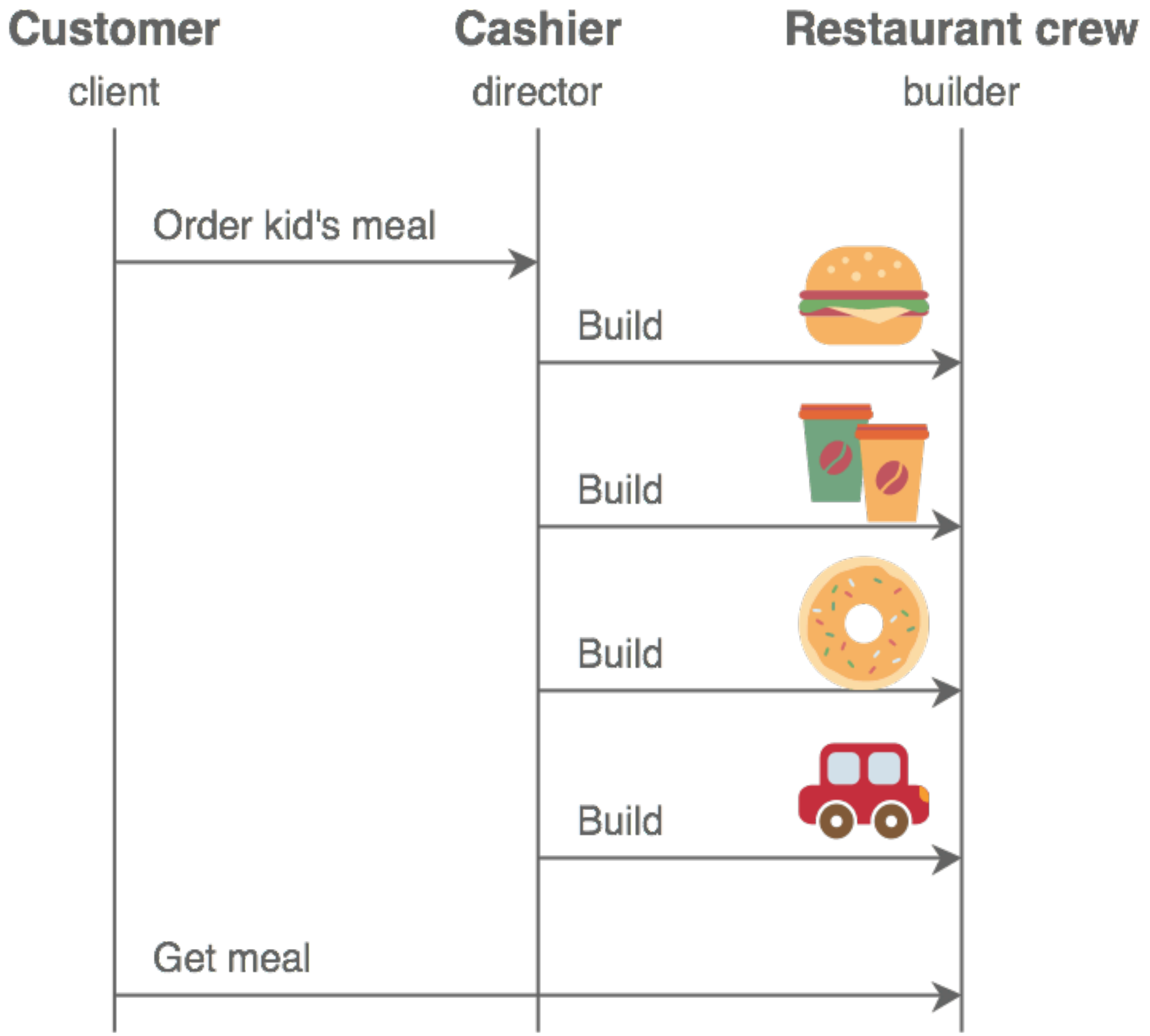
Builder (Creational) Design Pattern

2. Bir araç firması kullanıcılarına istedikleri araçların **grafiksel modelini** ekrana çizdiren

   - Araç nesnesi istenilen özellikleri içermelidir
   - Çizim nesneside istenilen özelliklere göre ekrana istenilen modeli çizecektir.
   - Sedan ve Spor araç sınıflarının her biri için özelliklerini gerçekleştirecek builder (oluşturucu) oluşturulur.

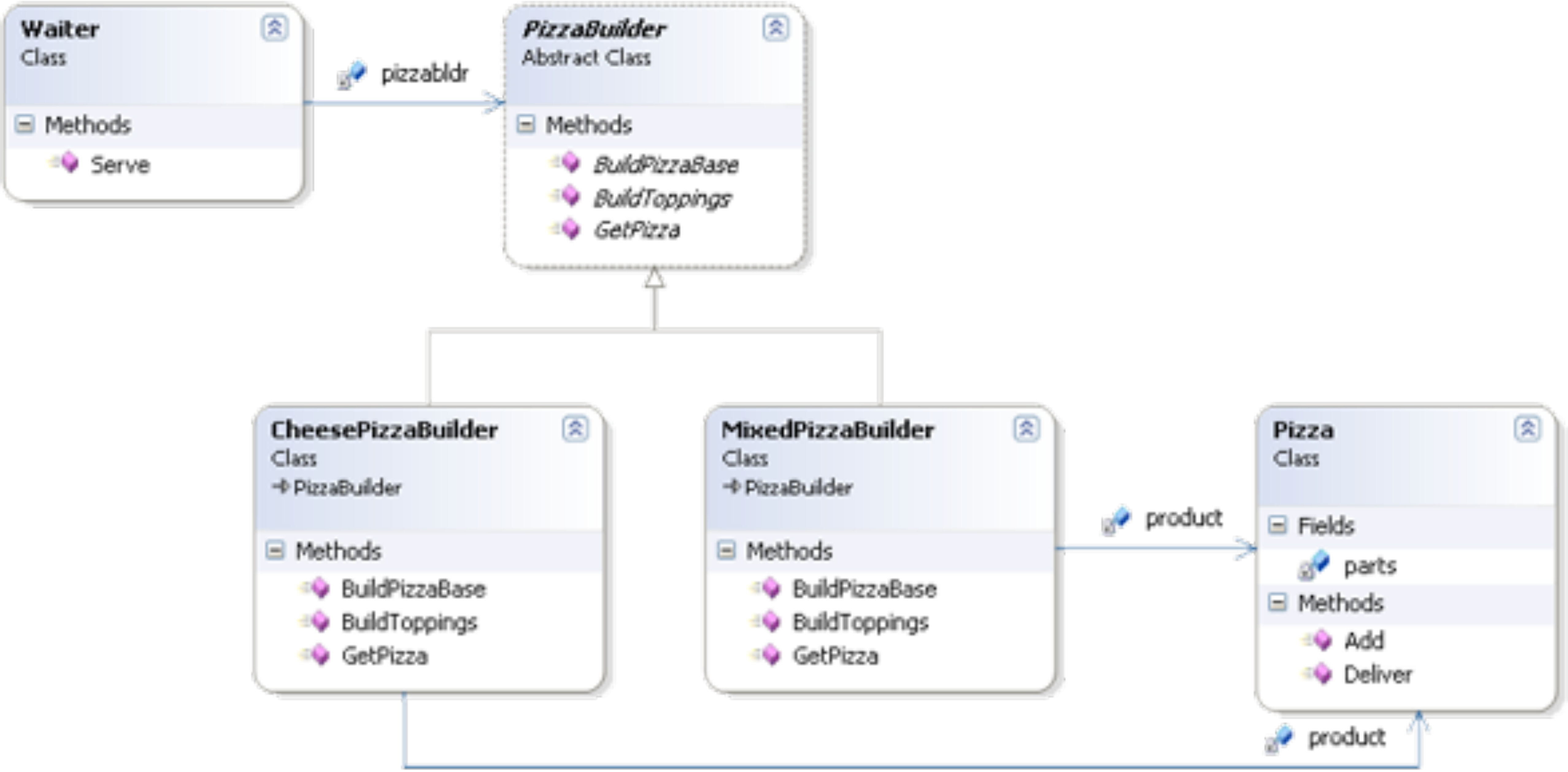
Builder (Creational) Design Pattern

3. Yemek firmaları istenilen **menüyü (ürün)** hazırlaması



https://sourcemaking.com/design_patterns/builder

Builder (Creational) Design Pattern



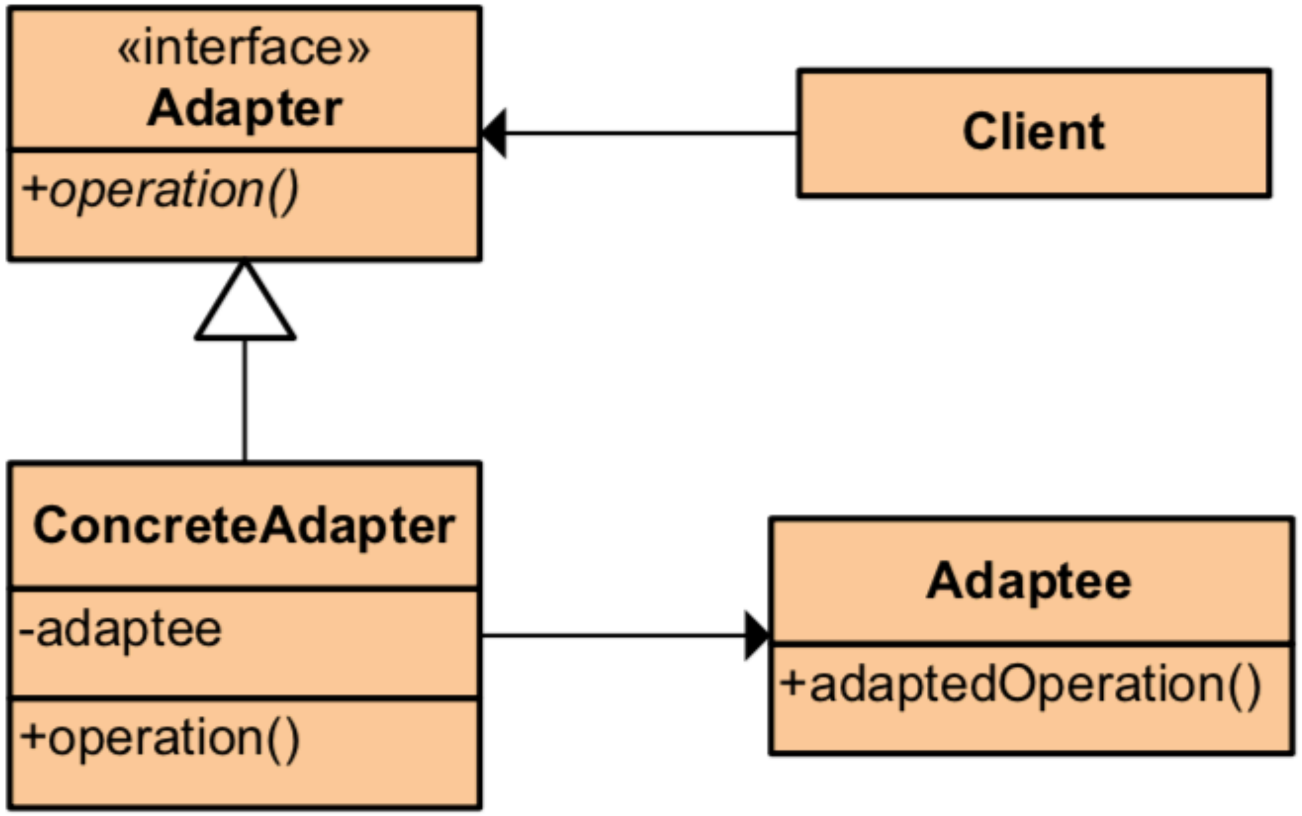
https://www.go4expert.com/articles/design-pattern-simple-examples-t5127/

Adaptor (Structural) Design Pattern

- **Bir birine uyumlu olmayan iki sistemin entegre edilerek beraber çalışmasını sağlayan** tasarım kalıbı Adaptor ′dür. (incompatible interfaces of the two objects which do not fit together can be used with an adaptor)

    - integrating a legacy code with a new code
    - changing a 3rd party API in the code
    - The Adapter pattern lets you to adapt what an object or a class exposes to what another object or class expects
    - **reusability**

Adapter (Structural) Design Pattern

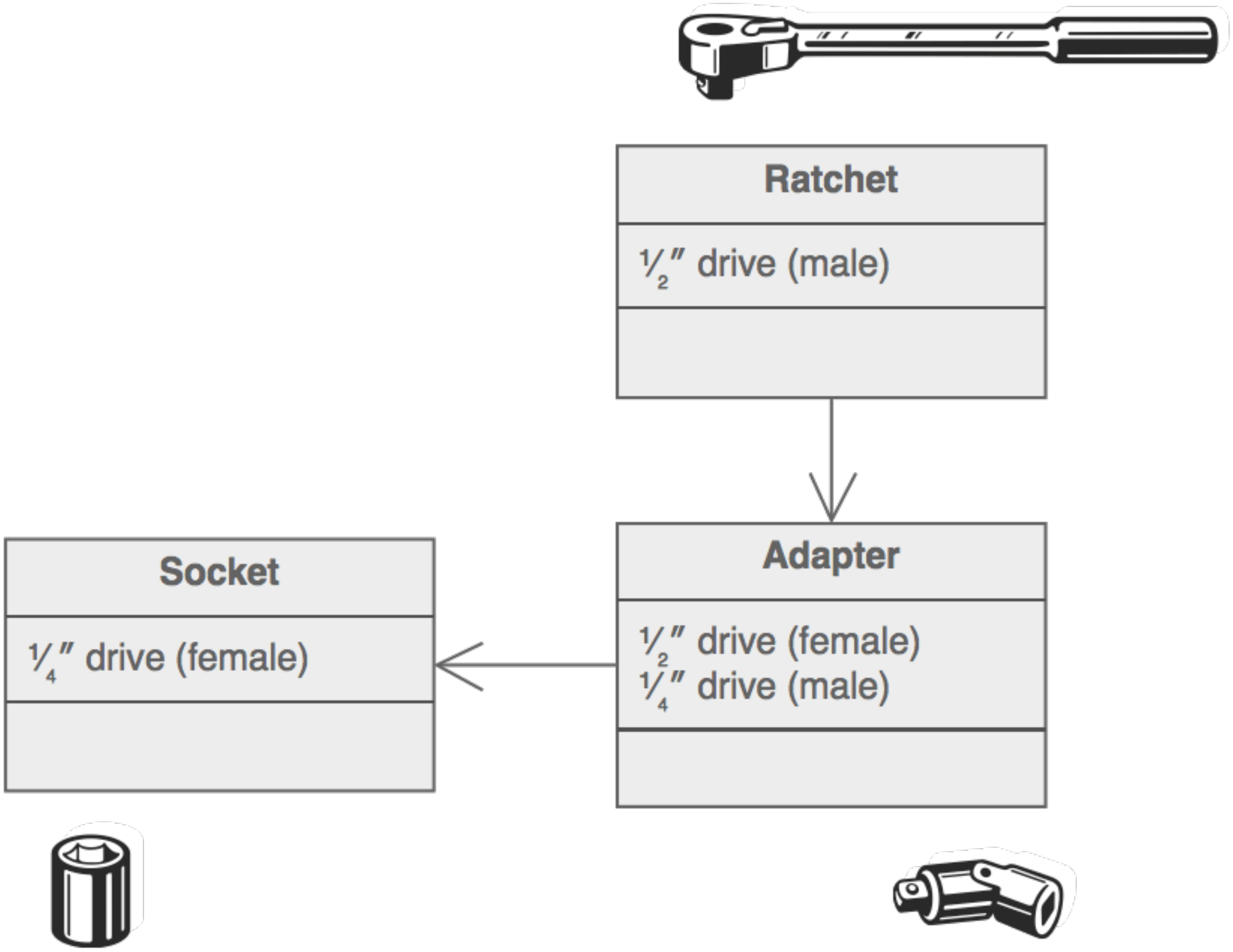


Adapter

Type: Structural

What it is:
Convert the interface of a class into another interface clients expect. Lets classes work together that couldn't otherwise because of incompatible interfaces.

Adapter (Structural) Design Pattern



Ratchet

½″ drive (male)

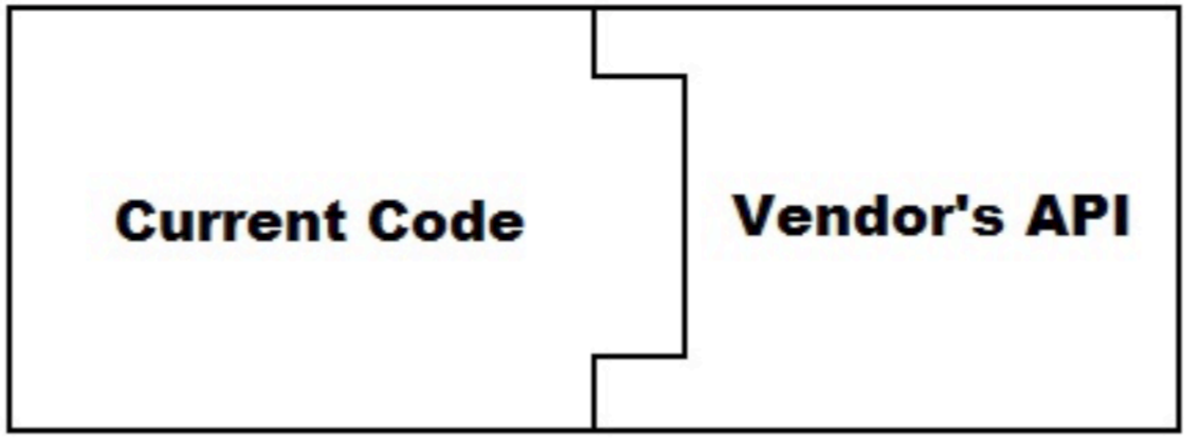
Adapter

½″ drive (female)
¼″ drive (male)

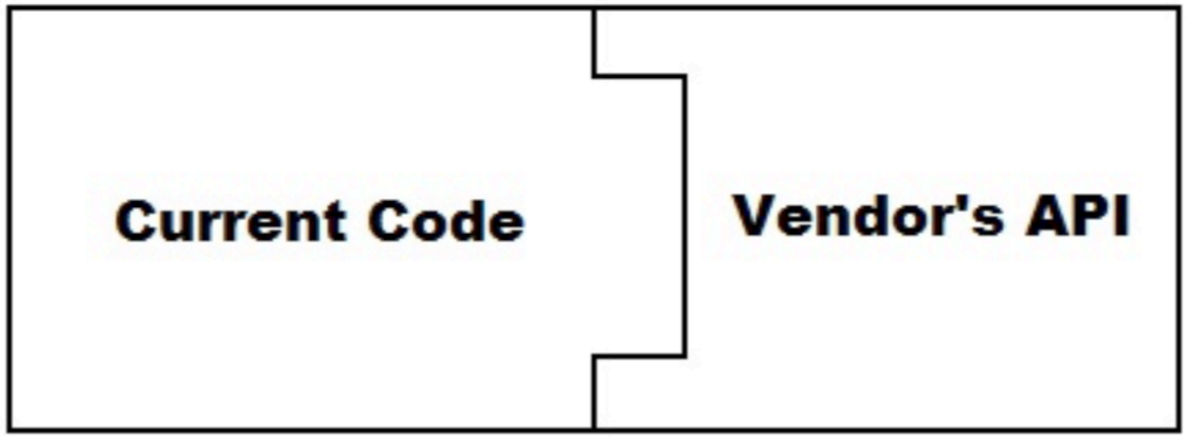
Socket

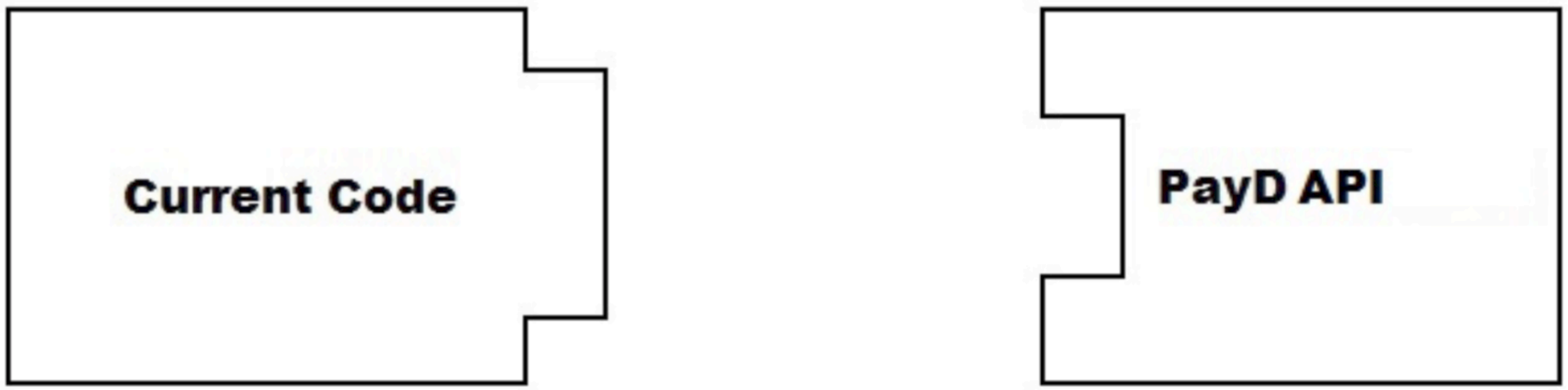
¼″ drive (female)

Adapter (Structural) Design Pattern

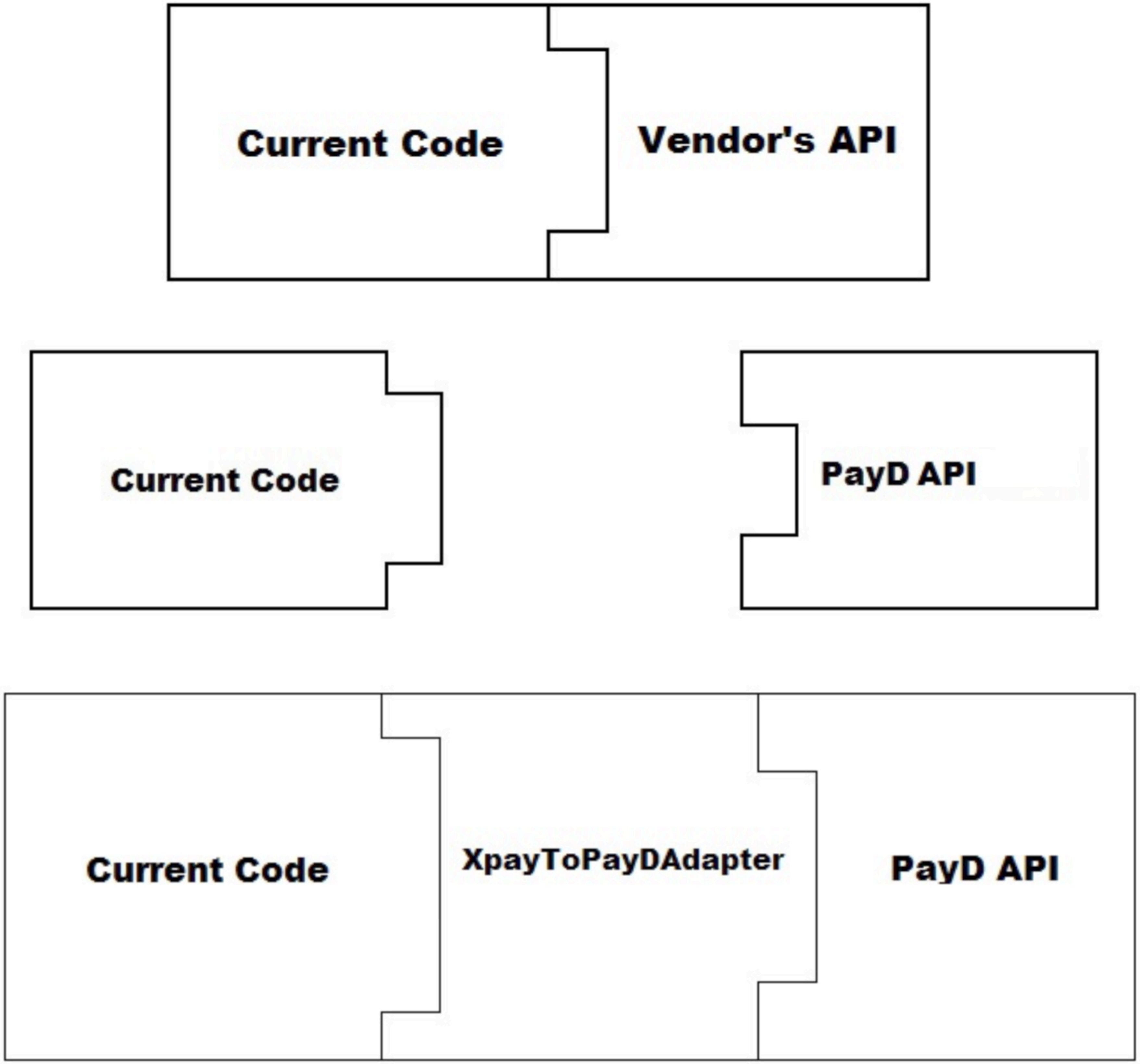


Adapter (Structural) Design Pattern





Adapter (Structural) Design Pattern



Current Code

Vendor's API

Current Code

PayD API

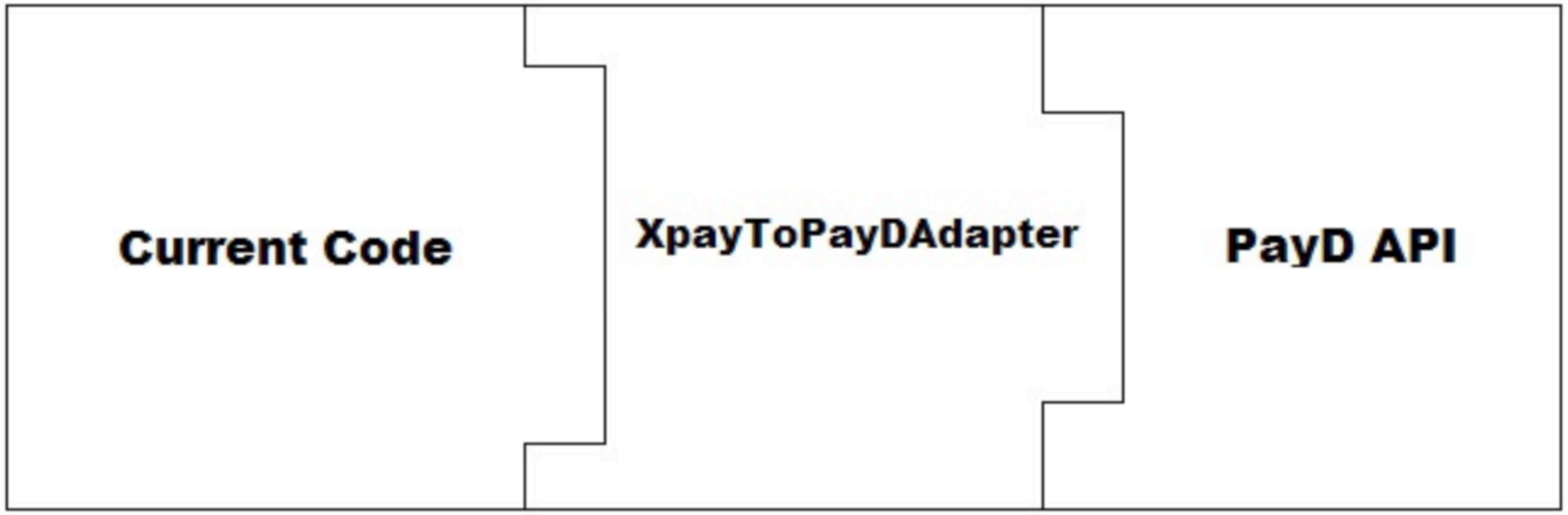
Current Code

XpayToPayDAdapter

PayD API

Adapter (Structural) Design Pattern

public interface PayD



public class XpayToPayDAdapter
implements PayD

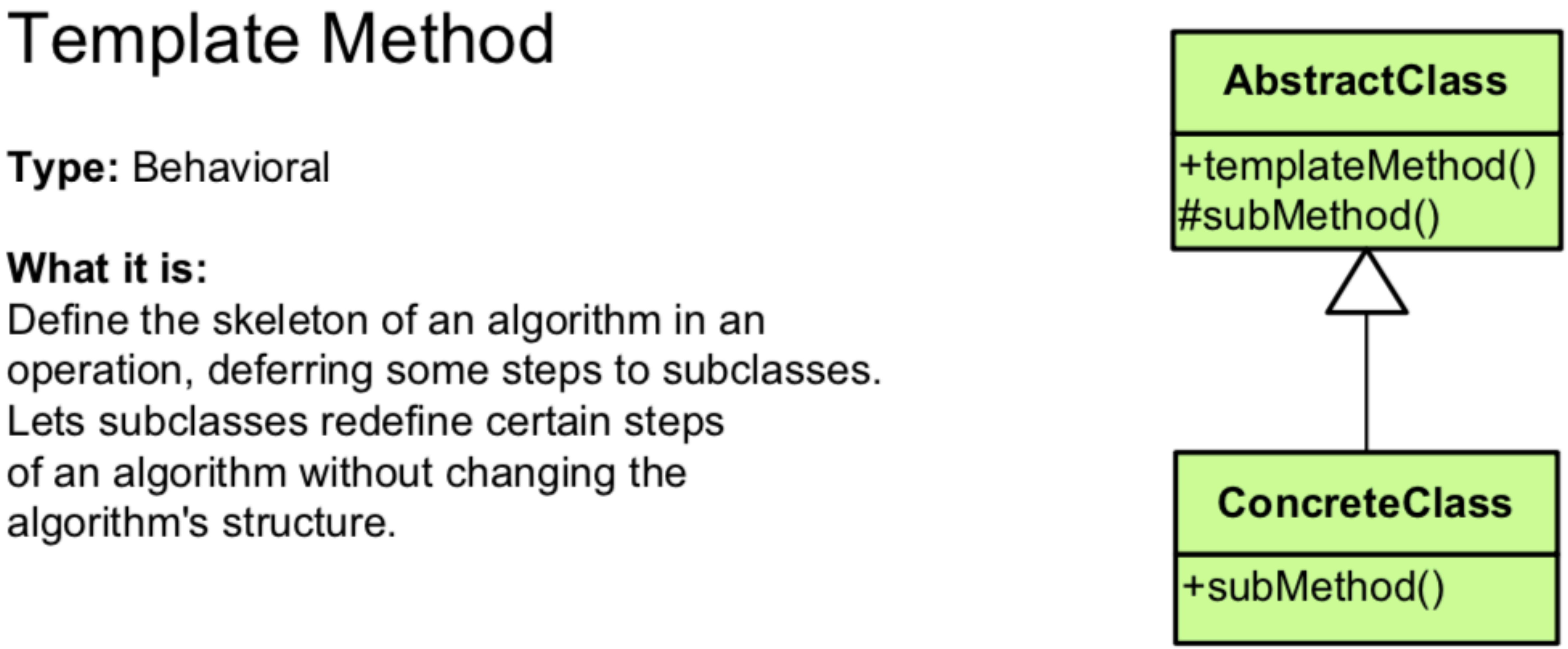
Adapter (Structural) Design Pattern

Template Method (Behavioral) Design Pattern

- Aşamaları belirli olan bir algoritmanın tanımlanıp kullanıcı isteklerine ihtiyaçlarına göre farklı kodlanılması imkanın sağlayan tasarım kalıbı Template'dır.

  - provides a template or a structure of an algorithm which is used by users.
  - A user provides its own implementation without changing the algorithm's structure

Template Method (Behavioral) Design Pattern

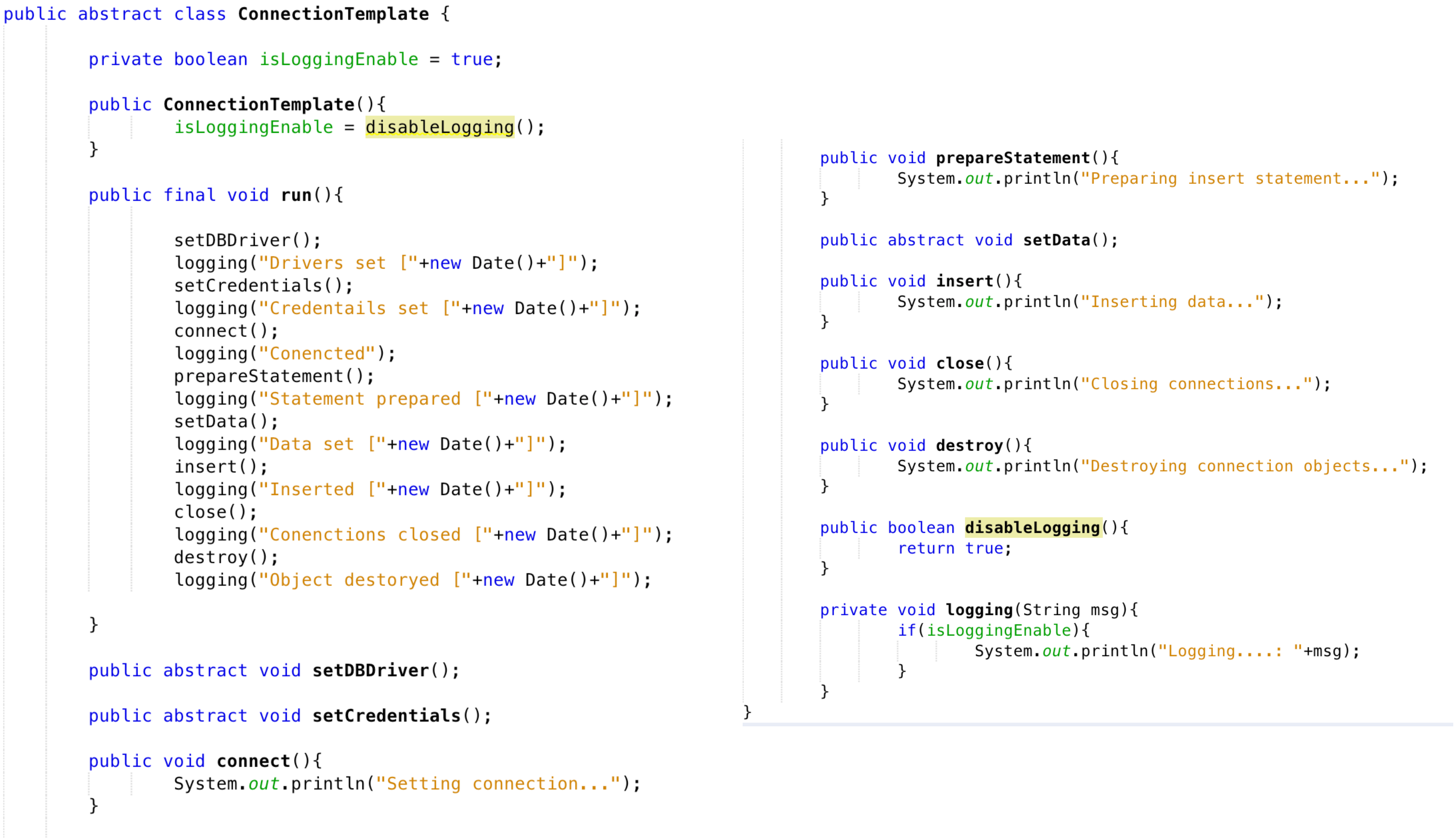


Template Method

Type: Behavioral

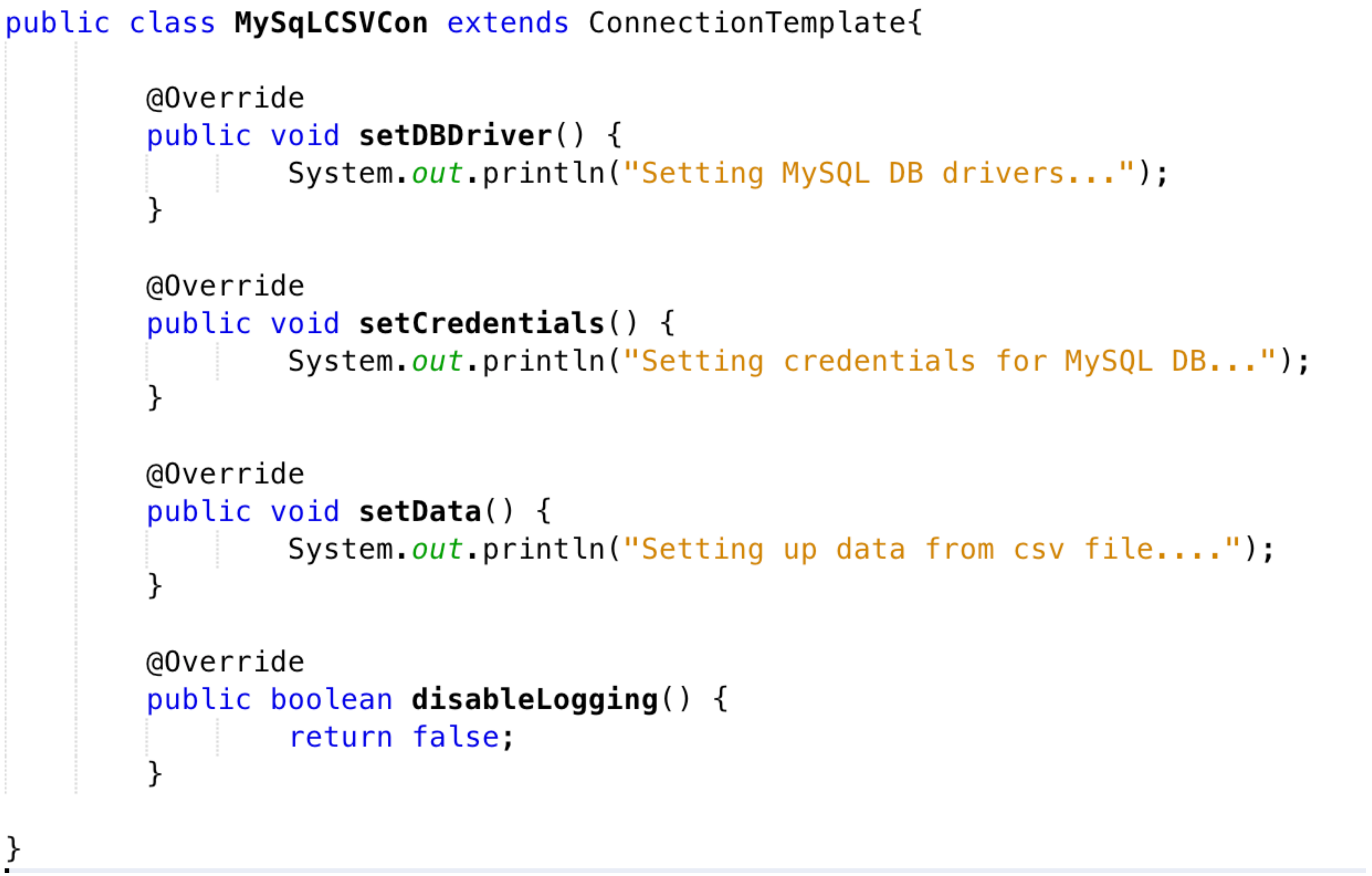
What it is:
Define the skeleton of an algorithm in an operation, deferring some steps to subclasses. Lets subclasses redefine certain steps of an algorithm without changing the algorithm's structure.

Template Method (Behavioral) Design Pattern



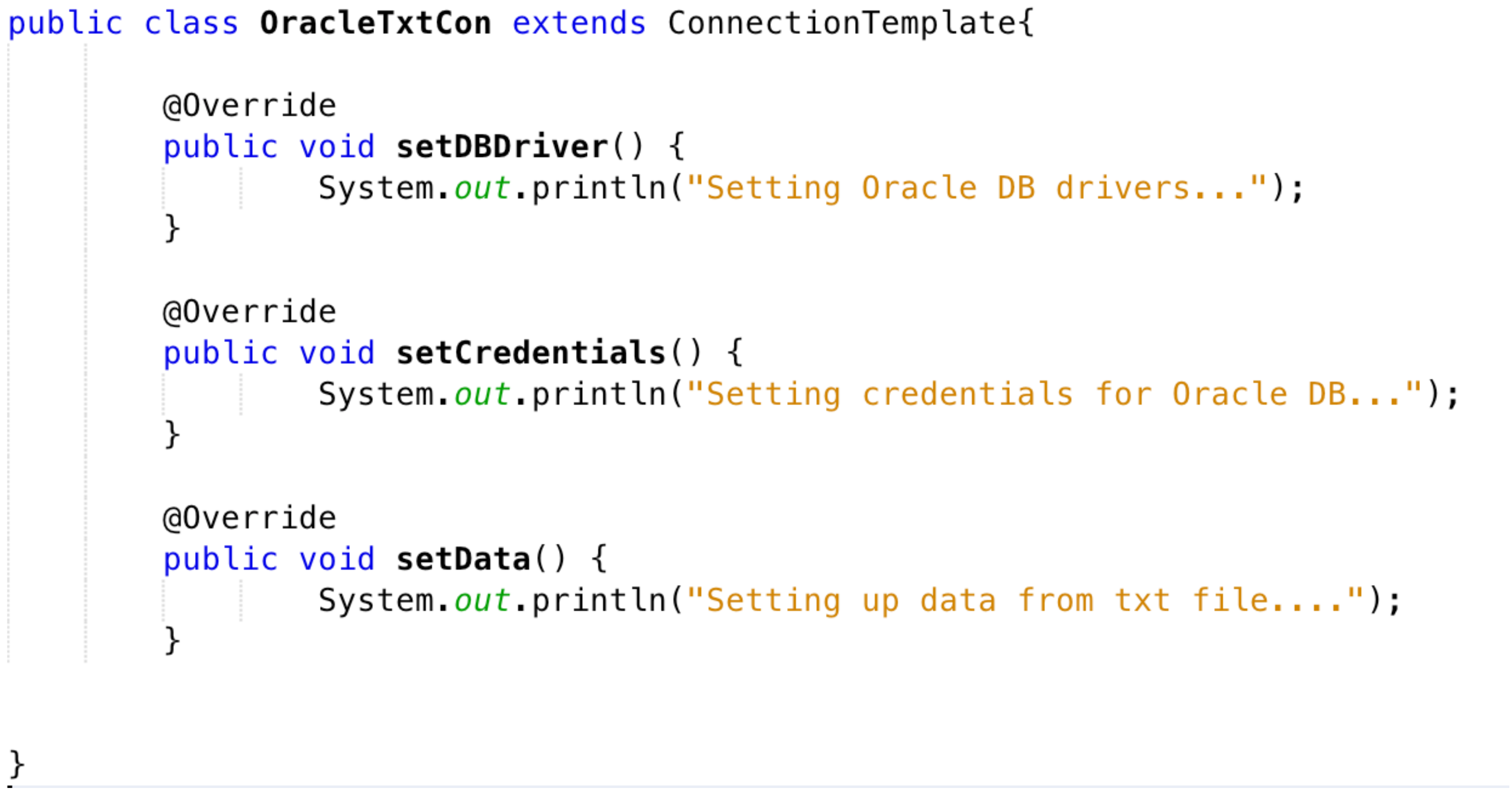
```
public abstract class ConnectionTemplate {

    private boolean isLoggingEnable = true;

    public ConnectionTemplate(){
        isLoggingEnable = disableLogging();
    }

    public final void run(){

        setDBDriver();
        logging("Drivers set ["+new Date()+"]");
        setCredentials();
        logging("Credentails set ["+new Date()+"]");
        connect();
        logging("Conencted");
        prepareStatement();
        logging("Statement prepared ["+new Date()+"]");
        setData();
        logging("Data set ["+new Date()+"]");
        insert();
        logging("Inserted ["+new Date()+"]");
        close();
        logging("Conenctions closed ["+new Date()+"]");
        destroy();
        logging("Object destoryed ["+new Date()+"]");

    }

    public abstract void setDBDriver();

    public abstract void setCredentials();

    public void connect(){
        System.out.println("Setting connection...");
    }

    public void prepareStatement(){
        System.out.println("Preparing insert statement...");
    }

    public abstract void setData();

    public void insert(){
        System.out.println("Inserting data...");
    }

    public void close(){
        System.out.println("Closing connections...");
    }

    public void destroy(){
        System.out.println("Destroying connection objects...");
    }

    public boolean disableLogging(){
        return true;
    }

    private void logging(String msg){
        if(isLoggingEnable){
            System.out.println("Logging....: "+msg);
        }
    }
}
```

Template Method (Behavioral) Design Pattern



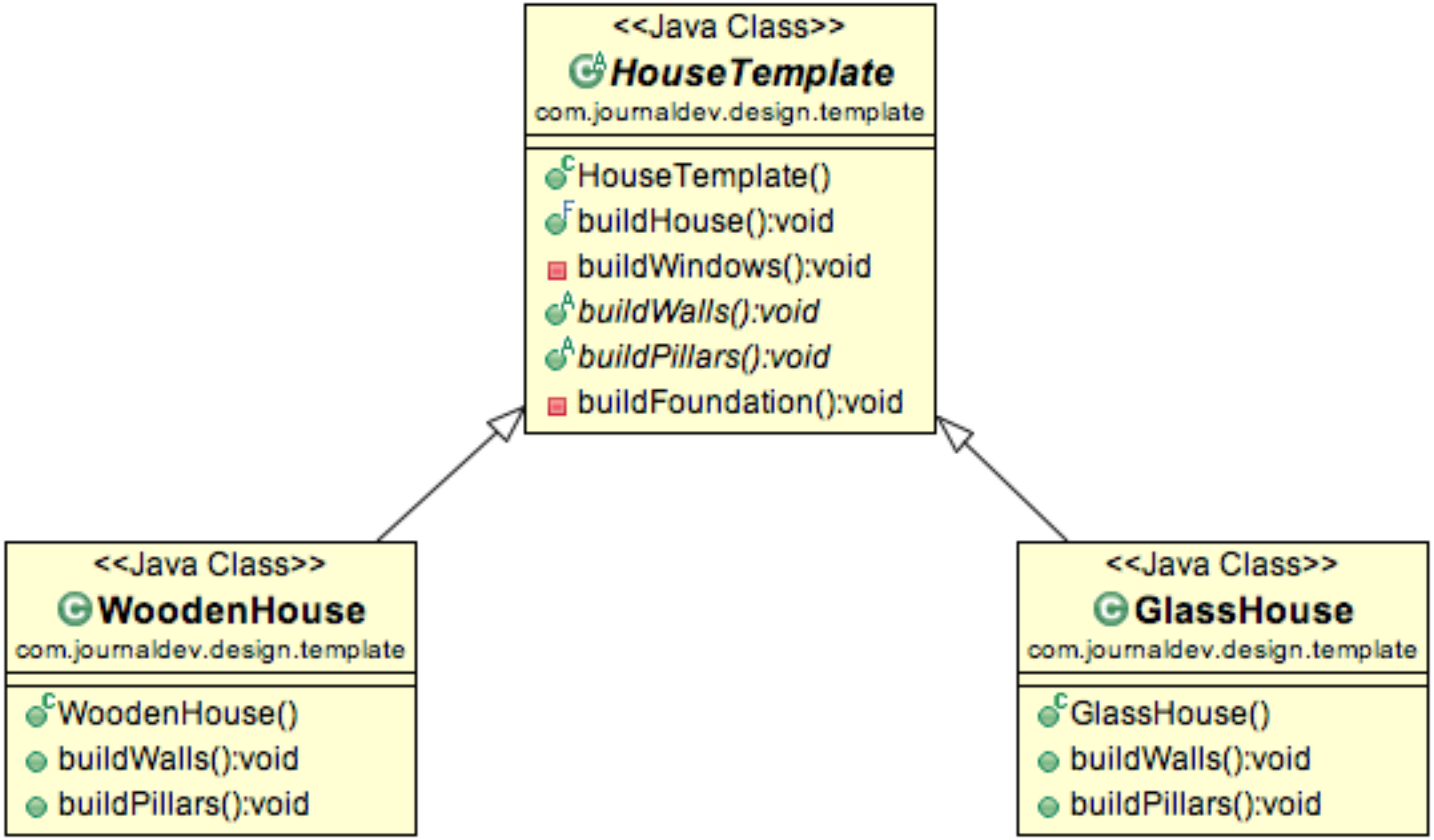
```
public class MySqLCSVCon extends ConnectionTemplate{

        @Override
        public void setDBDriver() {
                System.out.println("Setting MySQL DB drivers...");
        }

        @Override
        public void setCredentials() {
                System.out.println("Setting credentials for MySQL DB...");
        }

        @Override
        public void setData() {
                System.out.println("Setting up data from csv file....");
        }

        @Override
        public boolean disableLogging() {
                return false;
        }

}
```

Template Method (Behavioral) Design Pattern



```java
public class OracleTxtCon extends ConnectionTemplate{

    @Override
    public void setDBDriver() {
        System.out.println("Setting Oracle DB drivers...");
    }

    @Override
    public void setCredentials() {
        System.out.println("Setting credentials for Oracle DB...");
    }

    @Override
    public void setData() {
        System.out.println("Setting up data from txt file....");
    }


}
```

Template Method (Behavioral) Design Pattern



<<Java Class>>
HouseTemplate
com.journaldev.design.template
HouseTemplate()
buildHouse():void
buildWindows():void
buildWalls():void
buildPillars():void
buildFoundation():void
<<Java Class>>
WoodenHouse
com.journaldev.design.template
WoodenHouse()
buildWalls():void
buildPillars():void
<<Java Class>>
GlassHouse
com.journaldev.design.template
GlassHouse()
buildWalls():void
buildPillars():void