



# Software Engineering





# Plan

- ◇ Design patterns
  - Decorator
  - Adapter
  - Composite





# Design patterns



“A design pattern, is a general reusable solution to a commonly occurring problem within a given context in software design.”



# Decorator



“The decorator pattern is a design pattern that allows behavior to be added to an individual object, either statically or dynamically, without affecting the behavior of other objects from the same class.”



# Example

Imagine you run a car service shop offering multiple services. Now how do you calculate the bill to be charged? You pick one service and dynamically keep adding to it the prices for the provided services till you get the final cost.

Customer requests: 1 cup of coffee with milk and whip please!

Let's take coffee for example:

- Simple Coffee
  - With Milk
  - With Whip

**Decorator pattern lets you dynamically change the behavior of an object at run time by wrapping them in an object of a decorator class.**



Adapter





“The adapter pattern is a software design pattern that allows the interface of an existing class to be used as another interface”



# Example

Imagine you run a car service shop offering multiple services. Now customer currently can only buy coffee and you want to add buying hot chocolate, so how can you manage that? You create an adapter that translates hot chocolate to coffee.

Customer requests: 1 cup of hot chocolate please!

Let's take coffee for example:

- Simple Coffee
- Hot chocolate?

**Adapter pattern lets you wrap an otherwise incompatible object in an adapter to make it compatible with another class.**



# Composite



“The composite pattern describes that a group of objects is to be treated in the same way as a single instance of an object. ”



# Example

Imagine you run a car service shop offering multiple services. Now customer wants to buy both coffee and hot chocolate, so how will you calculate the total bill to be charged? You treat all different types of items bought the same.

Customer requests: 1 cup of coffee with milk and whip & 1 cup of hot chocolate please!

Let's take coffee for example:

- Simple Coffee with Milk and Whip
- Hot chocolate

**Composite pattern lets clients treat the individual objects in a uniform manner.**



Thanks!

**Any questions?**





# References

- ◇ <https://github.com/kamranahmedse/design-patterns-for-humans#-composite>
- ◇ [https://www.tutorialspoint.com/design\\_pattern/index.htm](https://www.tutorialspoint.com/design_pattern/index.htm)
- ◇

