Hi everyone, my name is Tai, I am a member of Group 17 and Welcome to my presentation on the topic of design patterns . we'll start with the basics what are design patterns ? then Why do we need design patterns? Then Types of design patterns and finally the most important Software design patterns.

First , In software engineering, a **design pattern** is a general repeatable solution to a commonly occurring problem in software design. It is a description or template for how to solve a problem that can be used in many different situations. All right so Why do we need design patterns?

Design patterns can speed up the development process by providing tested, proven development paradigms. Reusing design patterns helps avoid potential problems that can cause major errors , and are easy to upgrade and maintain later. A great advantage to using a design pattern is that other programmers will be able to easily recognize it, especially if you use good naming conventions. In addition, design patterns help programmers to understand other people's code quickly

There are 23 design patterns which can be classified in three categories:

Creational patterns -to create objects of the right class for a problem , generally when instance of several different classes are available.

Structural patterns -to form larger structures from individual parts generally of different classes .

Behavioral patterns -to describe interactions between objects .They forcus on how object communicate classes.

The following I will introduce about the most important Software design patterns.

First , The singleton pattern is used to limit creation of a class to only one object. This is beneficial when one (and only one) object is needed to coordinate actions across the system. Second, The strategy pattern allows grouping related algorithms under an abstraction, which allows switching out one algorithm or policy for another without modifying the client , third The Adapter Pattern allows you to modify interfaces between objects or classes without having to directly modify objects or classes. And some design patterns like builder patterns, Factory method ,….

Through this topic, I hope everyone can understand the designs patterns, thank you for listening and have a great day.