Types of problems Design pattern solves

(1) **Reusability:** Design patterns provide reusable solutions to common problems, allowing developers to avoid reinventing the wheel and saving time and effort.
(2) **Flexibility:** Design patterns make software more flexible and adaptable to changes, as they provide a structure that can be easily modified or extended without affecting the entire system.
(3) **Maintainability:** Design patterns promote code organization and separation of concerns, making it easier to understand, modify, and maintain the software over time.
(4) **Scalability:** Design patterns help in building scalable systems by providing guidelines for structuring and organizing code in a way that allows for easy expansion and addition of new features.
(5) **Modularity:** Design patterns encourage modular design, where different components of the system are loosely coupled, making it easier to test, debug, and update individual parts without affecting the whole system.
(6) **Performance:** Some design patterns, such as the Flyweight pattern, can improve performance by reducing memory consumption and improving efficiency.
(7) **Extensibility:** Design patterns provide a framework for adding new functionality to existing systems without modifying the existing code, making it easier to extend and enhance software.
(8) **Code maintainability:** Design patterns promote code organization and separation of concerns, making it easier to understand, modify, and maintain the software over time.