Separation of Concerns (SoC)

- Design principle originating from Dijkstra in 1974

- One should strive to separate components of a program into modules that address individual concerns

- What were the concerns for the message board project?

    - Exchanging information with the server

    - Presenting posts to the user

    - Allow the user to enter and submit a post

- Modules following SoC are more likely to be easily testible and reusable

- Interactions between modules can be kept to a minimum

Single Responsibility Principle (SRP)

- Related to SoC, often used to talk about classes

- Every class (or function if not using OOP) should have responsibility over a single part of a program's functionality

Cohesion

- The degree to which elements of a module belong together

- In contrast to coupling, one should strive for high cohesion

- Higher cohesion usually leads to looser coupling and vice versa

Software Systems

- Interactions among objects, events, and activities

- Exist in an environment

    - Aspects of the system that are out of the control
    of the system
        - Operating system

        - Libraries and frameworks

        - etc.
    - Important to identify elements of the system on the
    boundary between the environment and the system

- Complex projects require layers of abstraction

    - Define the high level properties of different components

    - "Drill down" to the implementation details of each component

Abstraction

- Some definitions from different contexts

  - From the ebook - The act of considering something as a general quality or characteristic, apart from concrete realities, specific objects, or actual instances

  - Distinction between external properties and internal details

  - Separation of interface from implementation

- You can use something if you know what it does, even if you don't know how it works

- You can create something that does something, even if you don't know how it will be used

- APIS

  - An API can have multiple independent implementations
  - Implementation details of an API can change without changing code that uses the API