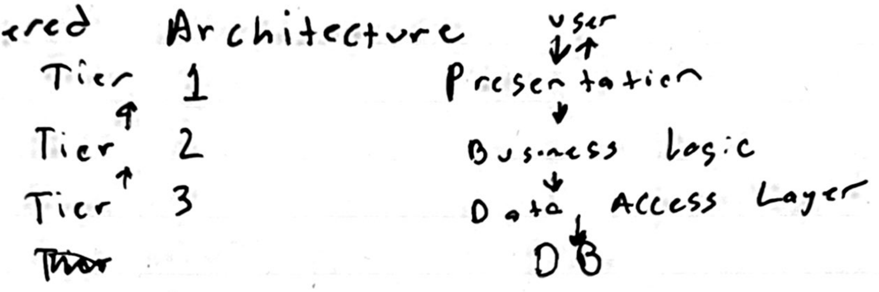
Clean Architecture

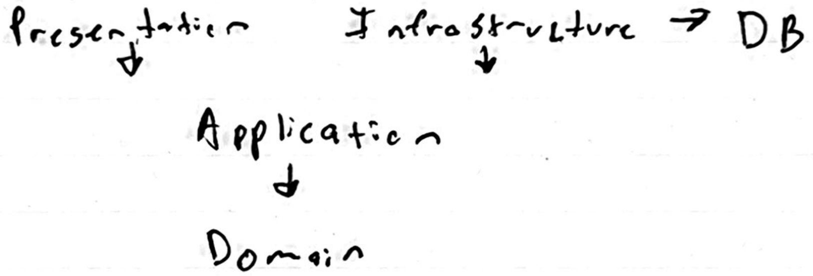
Architectural Patterns

A general, reusable solution to a commonly ocurring problem in software architecture ~~given~~ within a given context

Layered Architecture



Clean Architecture



The Presentation Layer

GymManagement.Contracts
Requests / Responses

GymManagement.API
Controllers

The Application Layer

- Executing the application's use cases
- Fetch domain objects
- Manipulate domain objects

Generally a bunch of Services

CQRS Pattern - Split Reads from Writes

Commands → Change States ie Create Subscription

Queries - Reads States ie Get Subscription

Gyms Write Service

Gyms Read Service

Mediator Pattern to reduce Coupling

MediatR nuget package

Add Mediatr function with Dependency Injection file allows for easy dependency injection

Result Pattern

Do not throw exceptions for expected errors

```
ErrorOr<User> GetUser(Guid id = default)
{
   if (id == default)
        return Error.Validation("Id is required");
   return new User(Name: "Blah");
}
errorOrUser.SwitchFirst(
   user => Console.WriteLine(user.name)
   error => Console.WriteLine(error.Description))
```

Repository - Illusion of in memory data

Unit of Work Pattern

Allows us to have rollback in a Command Handler

Infrastructure Layer

Interacting with persistence storage

Interacting with other services (web clients, message brokers, etc)

Interacting with underlying machine (system clock, files, etc)

Identity Concerns

Domain Driven Design

Break up complex designs into smaller chunks

Domain Models contain properties + behavior

Anemic - expose data, relies on external components

Rich - expose only specific set of methods

- private fields and properties

Domain Layer

Start here ideally - handle business logic

- Defining domain models
- Defining domain errors
- Executing Business Logic
- Enforcing Business Rules

Domain Layer Errors

Requested action violates a business rule, Unexpected manipulation on domain objects.

Application Layer Errors

Domain Object Cannot be found, User is Unauthorized Invalid data, Convert DLE and PLE errors to ALE

Presentation Layer Errors

Request Data is Invalid, action doesn't exist User not Authenticated, Convert DLE/ALE errors to PLEs