Assignment 1:

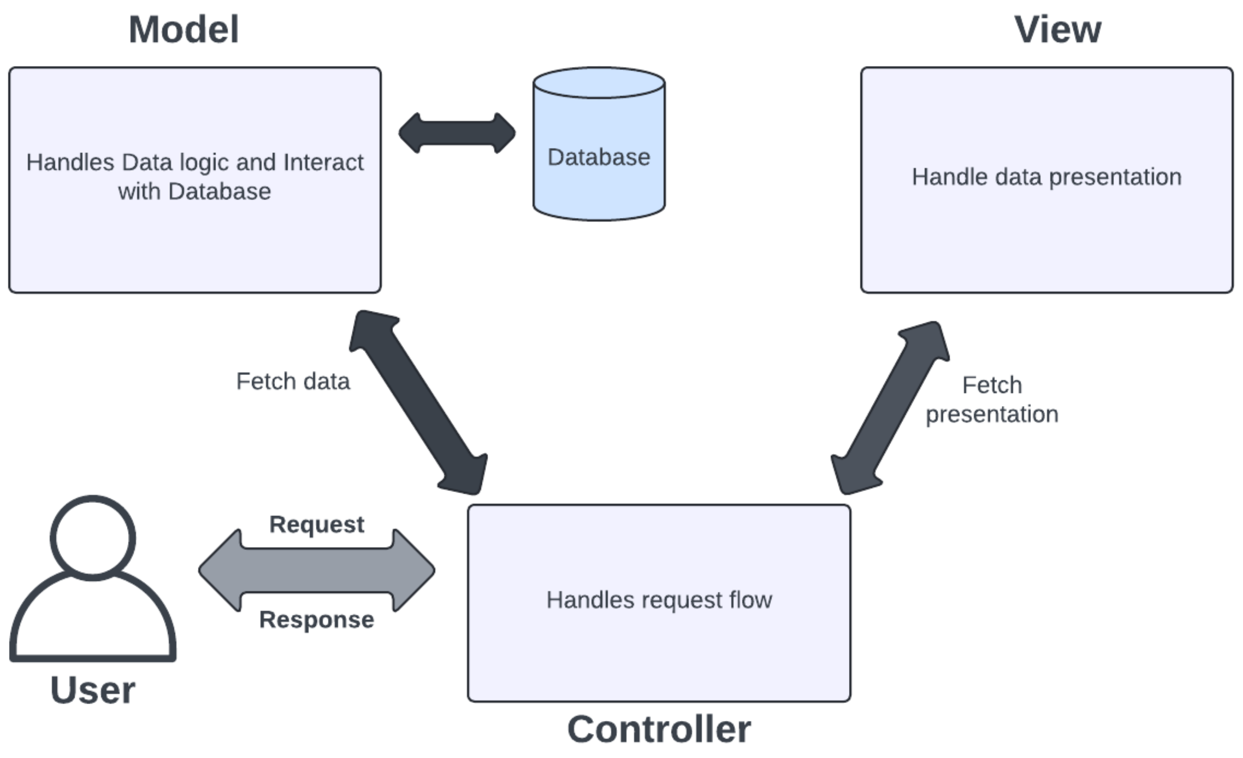
Design Pattern Explanation - Prepare a one-page summary explaining the MVC (Model-View-Controller) design pattern and its two variants. Use diagrams to illustrate their structures and briefly discuss when each variant might be more appropriate to use than the others.

MVC (Model-View-Controller):

MVC is an architectural design pattern that is separated into three logical components Model, View and Controller. It was traditionally used for desktop graphical user interfaces (GUI) and it is also used for mobile apps.

It supports large teams of web designers and developers and this will help for easy to maintain and can be extended easily.

MVC Architecture:



Controller:

- A controller is interconnected between the view and model.
- It tells the model what to do. It processes all the business logic and incoming requests.
- Manipulates data using model component and interacts with view to render the final output.

Model:

- Model represents the data and business logic of the application.
- It adds or retrieves data from the database.
- The model interacts with the database and gives the required data back to the controller.

View:

- The view component is used for all the UI logic of the application. It generates a user interface for the user.
- View which is created by the data which is collected by the model component but this data collected through a collector.

Variants:

Classic MVC

- When the model state changes, it notifies the view, which updates itself accordingly.
- The controller handles user input and updates the model based on the input received. It also updates the view if necessary.

Usage:

- Uses in small to medium-sized applications.
- Provides simplicity and implementation for simpler projects.

MVC with observer

- The controller remains responsible for handling user input and updating the model. It does not directly update the view.
- Update itself when notified of changes.

Usage:

- Recommended for large-scale applications with complex user interfaces.
- Beneficial when there’s a need for multiple views to observe the same model.