Computer Science and Engineering Discipline
Khulna University, Khulna

Software Development Project
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# Architecture Pattern

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**Project Title:** Kids Learning Software

**As an Architect,**

I propose the adoption of a Layered Architecture pattern for the kids learning software, So that we can organize the application into distinct layers, promoting separation of concerns and modularity.

## Components of Layered Architecture:

### a. Presentation Layer:

- **Responsibility:** The Presentation Layer is responsible for user interaction and interface presentation.
- Implementation:
- **Word Learning Interface:** Present word definitions, examples, and interactive learning activities to the user.
  Practice Interface: Display practice exercises, quizzes, and interactive activities for reinforcing learning.
  Progress Dashboard: Show users their learning progress, achievements, and areas for improvement.

### b. Application Layer:

- **Responsibility:** The Application Layer contains the business logic and orchestrates interactions between the presentation layer and the domain layer.
- **Implementation:**
  Word Learning Service: Manage word learning sessions, handle user interactions, and trigger practice activities.
  Practice Service: Manage practice sessions, evaluate user responses, and provide feedback.
  Progress Tracking Service: Retrieve and update user progress data, calculate scores, and communicate with the presentation layer for displaying progress information.

## c. Domain Layer:

- **Responsibility:** The Domain Layer encapsulates the core business logic and domain entities of the application.
- **Implementation:**
  Word Repository: Manage word data, including definitions, examples, and related information.
  Practice Generator: Generate practice exercises, quizzes, and learning materials based on word lists and user progress.
  Progress Tracker: Track user progress, calculate scores, achievements, and provide insights for improvement.

## d. Data Access Layer:

- **Responsibility:** The Data Access Layer handles data persistence and retrieval operations.
- **Implementation:**
  Word Database: Store word data, practice exercises, user progress, and other relevant information.
  Progress Tracking Database: Store user progress data, scores, achievements, and other metrics.

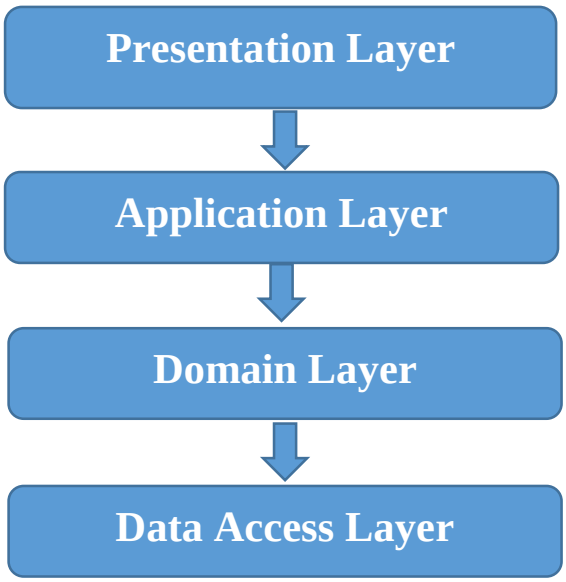


Fig: Diagram of Layered Architecture Pattern of Kids Learning Software

## Advantages of Layered Architecture for Kids Learning Software:

- Modularity: The Layered Architecture pattern promotes modular design, allowing each layer to be developed, tested, and maintained independently.
- Separation of Concerns: Each layer focuses on specific responsibilities, promoting clean separation of business logic, presentation, and data access concerns.
- Scalability: With clear boundaries between layers, the software can scale horizontally by adding more instances or vertically by enhancing individual layers.
- Maintainability: Changes to one layer can be made without affecting others, facilitating easier maintenance and updates over time.