

Layered Architecture Model of an Online Judge System.

Presentation Layer

Example: website / mobile app

Application Layer

Example: Manages authentication,

Service Layer

Example: code execution,
email notifications

Data Layer

Example: Users information,
problems, results etc

Infrastructure Layer

Example: cloud hosting Docker etc

Below given respective layers:

1 Presentation Layer:

- The interface where users interact with the system.
- Allows users to browse problems, submit code and view results.
- Provides dashboards for contests, leaderboards and submission history.

2 Application Layer (Business Logic Layer)

- Handles the core functionalities of the system.
- Manages problem storage, submission evaluation and contest scheduling.

3 Execution Layer (Code Execution Environment)

- securely compiles and executes user-submitted code.
- Runs code in an isolated environment to prevent system risk.

4. Data Layer

- Stores and manages all persistent data
- Maintains user profiles, problem statements and submission records.

5. Integration Layer (External Services Layer)

- Connects the system to external tools and services.
- Detects plagiarism by comparing submissions.