

Homework - Course Resigter of University

Design a university semester course-registration system where each section has only dozens of seats but thousands of students trying to enroll simultaneously. You must handle the rush so that:

- Students receive immediate, clear feedback (enrolled, wait-listed, or full)
- The system stays fast and reliable even under heavy, simultaneous load

Assumption about System:

- Over 300 courses that are opened in each semester, each course has about 30 slots.
- Over 8000 students concurrently register in system, each student will register at least 3 subjects.

Expectation with Homework:

- Identity where are issues that freshser needs to resolve
- Handling high-contention in database
- Use the knowledge about transaction, caching, and asynchronous handling to resolve problem.

Evaluation Requirement

The sildes contains some extra questions, Mentor can verify more with Fresher. Mentors can adjust the questions to reduce difficulty and complexity to suit the team's domain.

Criteria	Sub-Criteria
Concept of Data Design	Understanding about Roles of each storage
	Understanding about limit of Stateless service
	Understanding about correlation between Domain and Data modeling
	Understanding about Lock Strategies
Database Fundamental & Transaction	Understanding clearly about ACID in Database
	Understanding about Isolation Level and be able to execute Read Phenomena
	Understanding about Write Skew and Lost Update
Optimization	Understanding basically about correlation between B+ tree and database

	Understanding and using index correctly
	Understanding how Pagination actually work
	Understanding about Partitioning, Sharding & Normalization trade off
Caching	Understanding about Cache Strategies
	Be able to apply Redis Types, Lua Script in Common Use Cases