

PROJECT ABSTRACT

Coding Question Bank with Topic Analytics

A personal coding question bank where students collect DSA problems, tag them by topic and difficulty, mark progress, and study topic-wise analytics that reveal weak areas before placement season. Delivered built-to-order with the working app, source code, report, PPT and viva kit.

01. Title

Coding Question Bank with Topic Analytics

02. Introduction / Background

Placement preparation fails most often not from lack of effort but from lack of direction: students solve random problems, repeat comfortable topics, and discover their weak areas only in the interview room. Generic problem lists cannot tell a student that their dynamic programming is at 20% while arrays are at 90%. This project builds a personal question bank — 48 curated DSA problems across 10 topics — with per-question topic/difficulty/status tagging and an analytics view that turns raw practice into a study plan: topic-wise completion bars, difficulty splits and weekly activity.

03. Problem Statement

Students track preparation in notebooks or not at all, so effort is invisible and revision is guesswork. The project addresses this with a question-bank web app where every problem carries topic, difficulty and status metadata; search and filters find the right problem fast; and the analytics view ranks topics by completion so the next study session targets the weakest link, not the most comfortable one.

04. Objectives

- Ship a curated bank of 48 DSA problems across 10 topics (arrays, strings, DP, graphs, trees, heaps, tries, design, searching, linked lists).
- Tag every question with topic, difficulty (Easy/Medium/Hard) and status (Solved/Attempted/To do).
- Provide search plus topic/difficulty/status filters over the bank.
- Compute topic-wise completion analytics with weakest-topic recommendations.
- Show weekly activity and difficulty-split charts for momentum tracking.
- Offer a question-detail view with problem summary, sample I/O, approach hints and personal notes.
- Deliver the complete student kit: app source, report, PPT and viva Q&A.;

05. Proposed Methodology

The bank is a structured in-memory dataset of question records rendered as a filterable table. Status changes (marking solved) propagate to the statistics cards and analytics views, which aggregate by topic and difficulty. The analytics view computes completion ratios per topic, sorts them to surface weak areas, and renders SVG bar charts; weekly activity is shown as a

seven-day strip. The detail view presents the problem statement, sample input/output, staged hints and a notes field.

06. System Architecture / Working

Three hash-routed views share one question store: Question Bank (stats cards, search, three filter dropdowns, clickable rows), Topic Analytics (per-topic progress bars sorted weakest-first, weekly activity strip, difficulty split, 'revise next' callout) and Question Detail (metadata pills, statement, sample, hints, notes, mark-as-solved button). Marking a question solved updates the store and re-renders every dependent view.

07. Hardware / Software Requirements

- Any modern web browser — no installation needed
- HTML5, CSS3, vanilla JavaScript (single-file app)
- SVG for charts (no external dependencies)
- Optional: static hosting for sharing the bank with peers

08. Expected Outcomes

- A working question-bank app with 48 tagged DSA problems.
- Topic-wise analytics that identify weak areas with completion percentages.
- Search, filters and a detail view with hints and notes.
- A complete report, PPT and viva Q&A; covering the data model and analytics logic.

09. Applications

- Structured DSA preparation for placements and internships.
- Coding-club practice tracking across a semester.
- Self-assessment before mock interviews.

10. Future Scope

- Spaced-repetition scheduling that resurfaces weak-topic questions.
- Timer mode with per-question solve-time analytics.
- Import of custom question sets (CSV/JSON).
- Peer comparison dashboards for study groups.