

Web Developer Intern Technical Challenge

Company Overview

You're working with EduConnect, a (fake) tech startup that helps educational organizations (schools, coaching centers, and educational NGOs) manage their student data, track academic progress, and streamline their administrative processes.

The Challenge

Background

EduConnect's current system faces critical performance issues:

1. Login times: 25-40 seconds on both web and mobile apps
2. Data loading: Very slow because database was not designed properly
3. Adding new features: Breaks existing functionality and requires rebuilding database
4. Security issues: Student and parent data is not properly protected

Goal: Make login time under 5 seconds, keep costs low, and protect sensitive data

Your Task

Design a database for StudentTracker - a simple version of their platform that manages:

1. What the system handles:

- a. Schools (different educational institutions)
- b. Users (teachers, principals, admin staff)
- c. Students (enrolled in various schools)
- d. Classes (different subjects and grade levels)
- e. Attendance (daily attendance records)
- f. Grades (test scores, assignments, report cards)
- g. Parents (contact information, communication records)

2. Important Numbers:

- a. Each school can have 500-10,000 students
- b. Each school runs 20-100 different classes
- c. Daily attendance creates 1,000-15,000 new records per school
- d. Teachers need to see their dashboard immediately after login

- e. Mobile app must work fast for parents checking student progress
- f. System starts with 50 schools, will grow to 500+ schools

Three Main Problems to Solve

1. Smart Database Design (Future-Ready)

- A. Design database so that adding new features (online exams, parent portal, fee management) doesn't break anything
- B. Make sure it can handle growth from 50 schools to 500+ schools
- C. Each school's data should be separate and secure

2. Fast Login and Data Loading

- A. Login should take less than 5 seconds even with lots of data
- B. Dashboard should load quickly
- C. Mobile apps should sync data fast
- D. Keep database queries minimal during login

3. Data Security and Privacy

- A. Protect sensitive student information (grades, personal details, family information)
- B. Make sure one school cannot see another school's data
- C. Secure storage for personal information
- D. Consider privacy laws and student data protection

What You Need to Submit

1. Database Design

- a. Database diagram showing all tables and how they connect
- b. List of tables with columns, primary keys, foreign keys

- c. Strategy for making queries fast (indexes, etc.)
- d. Security features in your design

2. Video Explanation (5-10 minutes):

- A. Record a video (Loom/any screen recorder) explaining:
- B. Why you designed the database this way
- C. How your design handles growth from 50 to 500+ schools
- D. How you make login fast (under 5 seconds)
- E. How you keep student data safe and secure
- F. What happens when we add new features later
- G. What choices you made and why

How We Will Evaluate:

- 1. Database Design (35%): Good table structure, relationships, ready for future
- 2. Speed/Performance (25%): Fast login, quick data loading
- 3. Data Security (25%): Protecting student information, keeping schools separate
- 4. Video Explanation (15%): Clear explanation of your thinking and reasoning

Security Questions to Think About:

- 1. How do you make sure School A cannot see School B's student data?
- 2. Where do you store sensitive information like student grades and parent contact details?
- 3. How do you make login secure but still fast?
- 4. What records do you keep of who accessed what data?
- 5. How do you handle different permission levels (principal vs teacher vs admin)?

Submit These Files:

Submit the required files in a **google drive folder link**, and make sure they are **all accessible**.

Deliverables (Any application without the video, will not be considered):

1. Database diagram and table design
2. Link to your video explanation

Deadline: 1 day from today - (27th September 2025 - 9pm ADT)

(Please follow this deadline, and not the one on Internshala)

Important Note: Educational institutions handle very sensitive data including minor students' information, family details, and academic records. Your design must show you understand both technical performance AND protecting this sensitive information.