Design Document

Data to Track

The system must capture and maintain the following information:

1. Event details: title, type, start/end time, venue, capacity, and status = active or cancelled
2. Student details: name, email, roll number, and associated college.
3. Student registrations: link between a student and an event.
4. Attendance: whether a registered student attended the event.
5. Feedback: rating 1to 5 and optional comment for each student per event.

Database Schema

Entities & Relationships

1. **College**: manages multiple students and events.
2. **Student**: can register for multiple events.
3. **Event**: belongs to a college, can have multiple registrations, attendance records, and feedback.
4. **Registration**: link between student and event.
5. **Attendance**: indicates whether the student was present in the event.

Table Structure

- **Colleges**: college_id, name, domain
- **Students**: student_id, college_id, name, email, roll_no
- **Events**: event_id, college_id, title, type, start_time, end_time, venue, capacity, is_cancelled
- **Registrations**: reg_id, student_id, event_id, registered_at

- **Attendance**: att_id, student_id, event_id, present, marked_at
- **Feedback**: fb_id, student_id, event_id, rating, comment, submitted_at

API Design

Event APIs

- **POST /events**: Create new event
- **GET /events**: List events (filter by type, date, etc.)

Student APIs

- **POST /students**: Add or update a student

Registration APIs

- **POST /registrations**: Register student to an event

Attendance APIs

- **POST /attendance**: Mark attendance for a student

Feedback APIs

- **POST /feedback**: Submit feedback for an event

Reporting APIs

- **GET /reports/events/popularity**: Registrations per event
- **GET /reports/events/attendance**: Attendance percentage per event
- **GET /reports/events/feedback**: Average feedback score per event
- **GET /reports/students/participation**: Events attended by a student
- **GET /reports/students/top**: Top active students

Workflows

Student Registration to Reporting

1. Student browses events.
2. Student registers for an event.

3. Attendance is marked on the event day.
4. Student submits feedback after attending.
5. Reports are generated using event, registration, attendance, and feedback data.

Assumptions & Edge Cases

1. Duplicate registrations are not allowed.
2. If an event is cancelled, registration, attendance, and feedback will be blocked.
3. Attendance can only be recorded for registered students.
4. If a student does not provide feedback, reports calculate averages only from submitted ratings.
5. If an event has no attendees, attendance percentage defaults to 0.

Reporting Requirements

1. **Event Popularity Report** → Number of registrations per event.
2. **Student Participation Report** → Number of events attended by each student.
3. **Attendance Report** → Attendance percentage per event.
4. **Feedback Report** → Average rating for each event.
5. **Bonus Reports**: Top 3 most active students, event popularity filtered by event type.