

Assignment 1/12/2026

SQL:

1. Explain Referential Integrity in RDBMS/SQL with sample queries.

- a. Referential Integrity means that a student.dept_id can only be: a value that exists in department.dept_id, OR NULL
- b. For example, if we want to deleting a department to delete its students, we could do:
 - i. FOREIGN KEY (dept_id) REFERENCES department(dept_id) ON DELETE CASCADE
- c. But if we want deleting a department to keep students but “detach” them, we could:
 - i. FOREIGN KEY (dept_id) REFERENCES department(dept_id) ON DELETE SET NULL

2. Explain Join in RDBMS/SQL with sample queries.

- a. INNER JOIN:

```
SELECT s.student_name, d.dept_name
FROM student s
JOIN department d ON s.dept_id = d.dept_id;
```

- b. LEFT JOIN:

```
SELECT s.student_name, d.dept_name
FROM student s
LEFT JOIN department d ON s.dept_id = d.dept_id;
```

- c. RIGHT JOIN:

```
SELECT s.student_name, d.dept_name
FROM student s
RIGHT JOIN department d ON s.dept_id = d.dept_id;
```

- d. Join 3 tables:

```
SELECT s.student_name, d.dept_name, sc.school_name
FROM student s
JOIN department d ON s.dept_id = d.dept_id
JOIN school sc ON d.school_id = sc.school_id;
```

Short questions:

- 1. Compare Developer API vs User API**
 - a. Developer API:
 - i. APIs designed for developers like programming/tools SDKs
 - ii. APIs for data fetching, like RestAPI, GraphQL, SOAP
 - b. User API:
 - i. APIs for user interface of data fetching, like RestAPI, GraphQL, SOAP
- 2. Explain components of REST API?**
 - a. url
 - b. Request method
 - c. Request header
 - d. Request body (optional)
 - e. Response
- 3. Compare each type of HTTP Method**
 - a. GET: read data, no body included
 - b. POST: read and create data, has body. Will get different response with same request but different body.
 - c. PUT: replace data, has body
 - d. PATCH: partial update, has body
 - e. DELETE: delete data
- 4. Explain authentication field in http header?**
 - a. Basic Auth: *Authorization: Basic base64(username:password)*
 - b. Bearer Token: *Authorization: Bearer eyJhbGciOiJIUzI1NilsInR5cCI6...*
 - c. API Key: *Authorization: ApiKey abc123* or *x-api-key: abc123*
- 5. Explain cookies field in http header?**
 - a. Cookies store **client-side state** and are automatically sent with requests
 - b. Cookies are used for Session management, Authentication, User preferences, and Tracking
- 6. Explain the purpose of http response headers? Why it is necessary?**
 - a. HTTP response headers provide metadata about the response, not the data itself.
 - b. It's necessary because:
 - i. Control browser behavior
 - ii. Security protections
 - iii. Authentication
 - iv. Control caching would be controlled
 - v. Cross-domain APIs