

## SQL Internship Task – File System Problem Solution

### Step 1: Database Schema Design

```
CREATE TABLE file_system (
  id INT PRIMARY KEY,
  name VARCHAR(100) NOT NULL,
  type ENUM('file', 'folder') NOT NULL,
  size INT, -- NULL for folders
  parent_id INT, -- NULL for root
  FOREIGN KEY (parent_id) REFERENCES file_system(id)
);
```

### Design Explanation

Each entry (file or folder) has a unique ID. Files have a size, folders have NULL. parent\_id links to the parent directory using a

### Step 2: Sample Data Insertion

```
-- Root directory
INSERT INTO file_system VALUES (1, 'Root', 'folder', NULL, NULL); -
- Folders
INSERT INTO file_system VALUES (2, 'Documents', 'folder', NULL, 1);
INSERT INTO file_system VALUES (3, 'Images', 'folder', NULL, 1); -
- Files in Documents
INSERT INTO file_system VALUES (4, 'Resume.docx', 'file', 200, 2);
INSERT INTO file_system VALUES (5, 'Project.pdf', 'file', 500, 2); -
- Files in Images
INSERT INTO file_system VALUES (6, 'Photo1.jpg', 'file', 150, 3);
INSERT INTO file_system VALUES (7, 'Photo2.jpg', 'file', 300, 3); -
- File in root
INSERT INTO file_system VALUES (8, 'Readme.txt', 'file', 100, 1);
```

### Step 3: SQL Queries

Various queries to simulate file system operations:

#### 1. List all files/folders inside 'Root'

```
SELECT name, type
FROM file_system
WHERE parent_id = (SELECT id FROM file_system WHERE name = 'Root');
```

#### 2. Total size of files in 'Documents'

```
SELECT SUM(size) AS total_documents_size
FROM file_system
WHERE parent_id = (SELECT id FROM file_system WHERE name = 'Documents') AND type = 'file';
```

#### 3. List all files in the system

```
SELECT name, size FROM file_system WHERE type = 'file';
```

#### 4. Full path of 'Project.pdf'

```
SELECT CONCAT(p.name, '/', f.name) AS full_path
FROM file_system f
JOIN file_system p ON f.parent_id = p.id
WHERE f.name = 'Project.pdf';
```

#### 5. Total number of files

```
SELECT COUNT(*) AS total_files FROM file_system WHERE type = 'file';
```

```
WITH RECURSIVE path_tree AS (
```

```
SELECT id, name, parent_id, name AS path FROM file_system WHERE parent_id IS NULL  
UNION ALL
```