CREATE WEEK12PROB5;

USE WEEK12PROB5;

-- University table

CREATE TABLE University (

UniversityID INT PRIMARY KEY,

Name VARCHAR(255),

Location VARCHAR(255),

SecondaryIndex\_Name VARCHAR(255)

);

-- Department table

CREATE TABLE Department (

DepartmentID INT PRIMARY KEY,

Name VARCHAR(255),

UniversityID INT,

SecondaryIndex\_Name VARCHAR(255),

FOREIGN KEY (UniversityID) REFERENCES University(UniversityID)

);

-- Program table

CREATE TABLE Program (

ProgramID INT PRIMARY KEY,

Name VARCHAR(255),

UniversityID INT,

SecondaryIndex\_Name VARCHAR(255),

FOREIGN KEY (UniversityID) REFERENCES University(UniversityID)

);

-- Course table

CREATE TABLE Course (

CourseID INT PRIMARY KEY,

Name VARCHAR(255),

ProgramID INT,

SecondaryIndex\_Name VARCHAR(255),

FOREIGN KEY (ProgramID) REFERENCES Program(ProgramID)

);

-- Syllabus table

CREATE TABLE Syllabus (

SyllabusID INT PRIMARY KEY,

CourseID INT,

Content TEXT,

SecondaryIndex\_CourseID INT,

FOREIGN KEY (CourseID) REFERENCES Course(CourseID)

);

-- Faculty table

CREATE TABLE Faculty (

FacultyID INT PRIMARY KEY,

Name VARCHAR(255),

Specialization VARCHAR(255),

UniversityID INT,

SecondaryIndex\_Name VARCHAR(255),

SecondaryIndex\_Specialization VARCHAR(255),

FOREIGN KEY (UniversityID) REFERENCES University(UniversityID)

);

-- Create secondary indexes

CREATE INDEX idx\_university\_name ON University (SecondaryIndex\_Name);

CREATE INDEX idx\_department\_name ON Department (SecondaryIndex\_Name);

CREATE INDEX idx\_program\_name ON Program (SecondaryIndex\_Name);

CREATE INDEX idx\_course\_name ON Course (SecondaryIndex\_Name);

CREATE INDEX idx\_course\_program ON Course (ProgramID);

CREATE INDEX idx\_faculty\_name ON Faculty (SecondaryIndex\_Name);

CREATE INDEX idx\_faculty\_specialization ON Faculty (SecondaryIndex\_Specialization);

Insert sample data

INSERT INTO University (UniversityID, Name, Location) VALUES

(1, 'Delhi University', 'Delhi'),

(2, 'Jawaharlal Nehru University', 'Delhi'),

(3, 'Aligarh Muslim University', 'Aligarh'),

(4, 'University of Jammu', 'Jammu');

INSERT INTO Department (DepartmentID, Name, UniversityID) VALUES

(101, 'Computer Science', 1),

(102, 'Mathematics', 2),

(103, 'Computer Engineering', 3),

(104, 'Physics', 2);

INSERT INTO Program (ProgramID, Name, UniversityID) VALUES

(201, 'MCA', 1),

(202, 'Ph.D. in Physics', 2),

(203, 'B.Tech in Computer Engineering', 3),

(204, 'M.Sc. in Mathematics', 2);

INSERT INTO Course (CourseID, Name, ProgramID) VALUES

(301, 'Database Management', 201),

(302, 'Quantum Mechanics', 202),

(303, 'Data Structures', 203),

(304, 'Linear Algebra', 204);

INSERT INTO Syllabus (SyllabusID, CourseID, Content) VALUES

(401, 301, 'Introduction to SQL, Normalization, SQL Queries'),

(402, 302, 'Wavefunctions, Operators, Schrödinger Equation'),

(403, 303, 'Arrays, Linked Lists, Sorting Algorithms'),

(404, 304, 'Vector Spaces, Eigenvalues, Determinants');

INSERT INTO Faculty (FacultyID, Name, Specialization, UniversityID) VALUES

(501, 'Shafiqul Abidin', 'Information Security', 1),

(502, 'Asim Zafar', 'Quantum Mechanics', 2),

(503, 'Sajida Khatoon', 'Data Structures', 3),

(504, 'Suhel Mustajab', 'Database Management', 1);

SQL QUERRIES ACC TO QUESTION

i) List of Universities situated at Delhi.

SELECT Name FROM University WHERE Location = 'Delhi';

ii) List of all Departments of AMU.

SELECT Name FROM Department WHERE UniversityID = 3;

iii) Find the location of JNU.

SELECT Location FROM University WHERE Name = 'Jawaharlal Nehru University';

iv) List of all Programs run by University of Jammu.

SELECT Name FROM Program WHERE UniversityID = 2;

v) List of Universities that run Program "MCA".

SELECT U.Name

FROM University U

INNER JOIN Program P ON U.UniversityID = P.UniversityID

WHERE P.Name = 'MCA';

vi) List of Courses of "MCA" run by AMU.

SELECT C.Name

FROM Course C

INNER JOIN Program P ON C.ProgramID = P.ProgramID

INNER JOIN University U ON P.UniversityID = U.UniversityID

WHERE U.Name = 'Aligarh Muslim University' AND P.Name = 'MCA';

vii) List of Faculties specialized in "Information Security" across different universities.

SELECT Faculty.Name AS FacultyName, University.Name AS UniversityName

FROM Faculty

INNER JOIN University ON Faculty.UniversityID = University.UniversityID

WHERE Faculty.Specialization = 'Information Security'

viii) Syllabus of "Computer Architecture" of different Universities.

SELECT University.Name, Syllabus.Content

FROM Syllabus

INNER JOIN Course ON Syllabus.CourseID = Course.CourseID

INNER JOIN Program ON Course.ProgramID = Program.ProgramID

INNER JOIN University ON Program.UniversityID = University.UniversityID

WHERE Course.Name = 'Linear Algebra';