those were the requierments

University Management System

Tables

Students
- `student_id`
- `name`
- `age`
- `major`
- `enrollment_date`

Courses
- `course_id`
- `name`
- `credits`
- `instructor`

Enrollments
- `enrollment_id`
- `student_id`
- `course_id`
- `grade`

Use Cases
- Identify students enrolled in a specific course
- Calculate the average grade for a course
- Update course details and track student progress

Implementation Plan

Create Schema and ERD
- Design an Entity-Relationship Diagram (ERD) showing the relationships among the tables

SQL Implementation
- Implement schema creation in SQL (CREATE TABLE commands)
- Create tables with primary keys, foreign keys, and constraints
- Insert rows in tables
- Update tables using UPDATE to modify records

Select Queries

- Use SELECT queries with:
    - WHERE clauses
    - Logical operators (AND, OR)
    - Filtering
    - Inner joins
    - Left or right joins
    - Querying data from multiple tables
    - Subqueries for advanced filtering or calculations

Python and Pandas Operations

Data Handling

- Read data using `pandas.read_sql()`
- Manipulate data:
    - Add columns: `df['new_column'] = df['existing_column'] * 2`
    - Delete columns: `df.drop(columns=['column_name'], inplace=True)`
- Indexing with `loc` and `iloc`
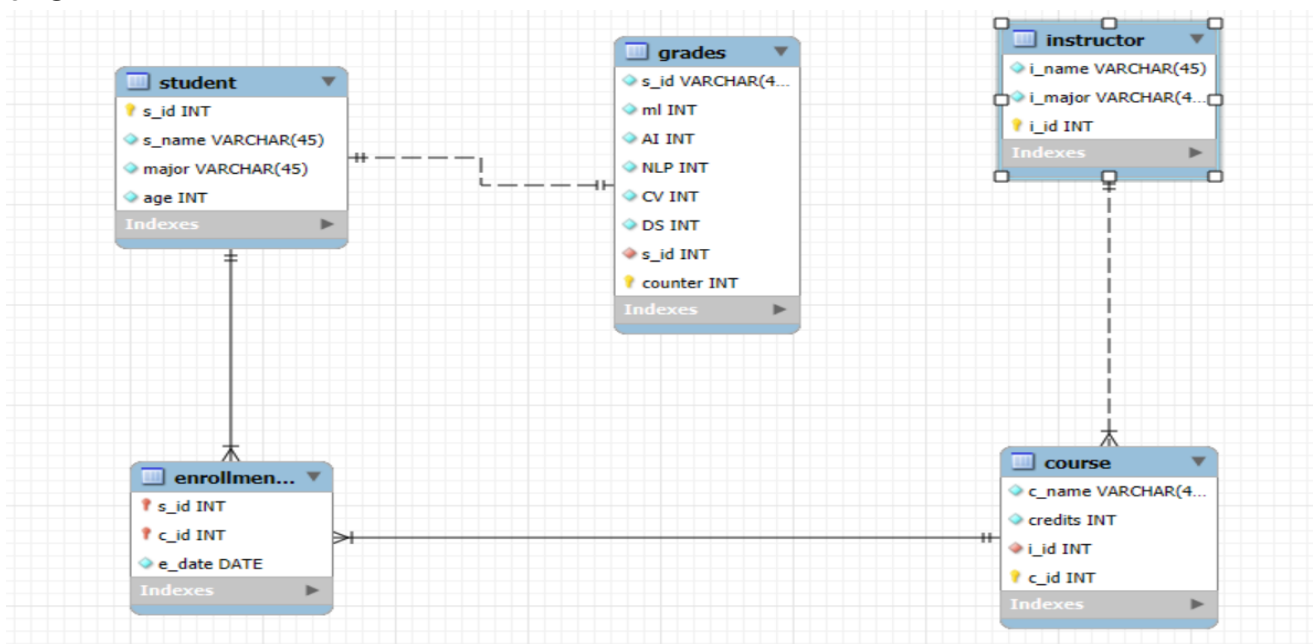- Export data using `df.to_csv()` or `df.to_excel()`

Additional Tasks

- Upload all work to GitHub

ERD Diagram

those are solutions

the ERD

loading reqierments

```python
import pandas as pd
import pymysql
%load_ext sql
```

creating the database

```
%sql create database ums;
```

creating tables

creating table student

```sql
%%sql
-- Student Table
CREATE TABLE Student (
    s_id INT PRIMARY KEY,
    s_name VARCHAR(45),
    major VARCHAR(45),
    age INT
);
```

creating table grades

```sql
%%sql
-- Grades Table
CREATE TABLE Grades (
    counter INT PRIMARY KEY,
    s_id INT ,
    MachineLearning INT,
    ArtificialIntelligence INT,
    NLPNaturalLanguageProcessing INT,
    ComputerVision INT,
    DataScience INT,
    DeepLearning INT,
    Algebra INT,
    Calculus INT,
    Probability INT,
    Statistics INT,
    FOREIGN KEY (s_id) REFERENCES Student(s_id)
);
```

creating table instructor

```sql
%%sql
-- Instructor Table
CREATE TABLE Instructor (
    i_id INT PRIMARY KEY,
    i_name VARCHAR(45),
    i_major VARCHAR(45)
);
```

creating table course

```
%%sql
-- Course Table
CREATE TABLE Course (
    c_id INT PRIMARY KEY,
```

```
    c_name VARCHAR(45),
    credits INT,
    i_id INT,
    FOREIGN KEY (i_id) REFERENCES Instructor(i_id)
);
```

creating table enrollment

```
%%sql
-- Enrollment Table
CREATE TABLE Enrollment (
    s_id INT,
    c_id INT,
    e_date DATE,
    PRIMARY KEY (s_id, c_id),
    FOREIGN KEY (s_id) REFERENCES Student(s_id),
    FOREIGN KEY (c_id) REFERENCES Course(c_id)
);
```

data insertion

insert 100 student

```
%%sql
-- insert 100 student
INSERT INTO Student (s_id, s_name, major, age) VALUES
(1, 'John Doe', 'Computer Science', 20),
(2, 'Jane Smith', 'Mathematics', 22),
(3, 'Alice Johnson', 'Math & Computer Science', 21),
(4, 'Bob Brown', 'Computer Science', 23),
(5, 'Charlie Davis', 'Mathematics', 19),
(6, 'Eva Green', 'Math & Computer Science', 24),
(7, 'Frank White', 'Computer Science', 20),
(8, 'Grace Black', 'Mathematics', 22),
(9, 'Henry Blue', 'Math & Computer Science', 21),
(10, 'Ivy Gray', 'Computer Science', 23),
(11, 'Jack Brown', 'Mathematics', 20),
(12, 'Karen White', 'Math & Computer Science', 22),
(13, 'Leo Green', 'Computer Science', 21),
(14, 'Mia Black', 'Mathematics', 23),
(15, 'Noah Blue', 'Math & Computer Science', 20),
(16, 'Olivia Gray', 'Computer Science', 22),
(17, 'Peter Brown', 'Mathematics', 21),
(18, 'Quinn White', 'Math & Computer Science', 23),
(19, 'Rachel Green', 'Computer Science', 20),
(20, 'Sam Black', 'Mathematics', 22),
(21, 'Tom Blue', 'Math & Computer Science', 21),
(22, 'Uma Gray', 'Computer Science', 23),
(23, 'Victor Brown', 'Mathematics', 20),
```

```
(24, 'Wendy White', 'Math & Computer Science', 22),
(25, 'Xander Green', 'Computer Science', 21),
(26, 'Yara Black', 'Mathematics', 23),
(27, 'Zack Blue', 'Math & Computer Science', 20),
(28, 'Anna Gray', 'Computer Science', 22),
(29, 'Ben Brown', 'Mathematics', 21),
(30, 'Cara White', 'Math & Computer Science', 23),
(31, 'Dan Green', 'Computer Science', 20),
(32, 'Ella Black', 'Mathematics', 22),
(33, 'Finn Blue', 'Math & Computer Science', 21),
(34, 'Gina Gray', 'Computer Science', 23),
(35, 'Hank Brown', 'Mathematics', 20),
(36, 'Iris White', 'Math & Computer Science', 22),
(37, 'Jake Green', 'Computer Science', 21),
(38, 'Kara Black', 'Mathematics', 23),
(39, 'Liam Blue', 'Math & Computer Science', 20),
(40, 'Maya Gray', 'Computer Science', 22),
(41, 'Nate Brown', 'Mathematics', 21),
(42, 'Olga White', 'Math & Computer Science', 23),
(43, 'Paul Green', 'Computer Science', 20),
(44, 'Quincy Black', 'Mathematics', 22),
(45, 'Rita Blue', 'Math & Computer Science', 21),
(46, 'Steve Gray', 'Computer Science', 23),
(47, 'Tina Brown', 'Mathematics', 20),
(48, 'Umar White', 'Math & Computer Science', 22),
(49, 'Vera Green', 'Computer Science', 21),
(50, 'Will Black', 'Mathematics', 23),
(51, 'Xena Blue', 'Math & Computer Science', 20),
(52, 'Yuri Gray', 'Computer Science', 22),
(53, 'Zane Brown', 'Mathematics', 21),
(54, 'Amy White', 'Math & Computer Science', 23),
(55, 'Brad Green', 'Computer Science', 20),
(56, 'Cara Black', 'Mathematics', 22),
(57, 'Dave Blue', 'Math & Computer Science', 21),
(58, 'Eve Gray', 'Computer Science', 23),
(59, 'Finn Brown', 'Mathematics', 20),
(60, 'Gina White', 'Math & Computer Science', 22),
(61, 'Hank Green', 'Computer Science', 21),
(62, 'Ivy Black', 'Mathematics', 23),
(63, 'Jack Blue', 'Math & Computer Science', 20),
(64, 'Kara Gray', 'Computer Science', 22),
(65, 'Leo Brown', 'Mathematics', 21),
(66, 'Mia White', 'Math & Computer Science', 23),
(67, 'Noah Green', 'Computer Science', 20),
(68, 'Olga Black', 'Mathematics', 22),
(69, 'Paul Blue', 'Math & Computer Science', 21),
(70, 'Quinn Gray', 'Computer Science', 23),
(71, 'Rachel Brown', 'Mathematics', 20),
(72, 'Sam White', 'Math & Computer Science', 22),
```

```
(73, 'Tom Green', 'Computer Science', 21),
(74, 'Uma Black', 'Mathematics', 23),
(75, 'Victor Blue', 'Math & Computer Science', 20),
(76, 'Wendy Gray', 'Computer Science', 22),
(77, 'Xander Brown', 'Mathematics', 21),
(78, 'Yara White', 'Math & Computer Science', 23),
(79, 'Zack Green', 'Computer Science', 20),
(80, 'Anna Black', 'Mathematics', 22),
(81, 'Ben Blue', 'Math & Computer Science', 21),
(82, 'Cara Gray', 'Computer Science', 23),
(83, 'Dan Brown', 'Mathematics', 20),
(84, 'Ella White', 'Math & Computer Science', 22),
(85, 'Finn Green', 'Computer Science', 21),
(86, 'Gina Black', 'Mathematics', 23),
(87, 'Hank Blue', 'Math & Computer Science', 20),
(88, 'Iris Gray', 'Computer Science', 22),
(89, 'Jake Brown', 'Mathematics', 21),
(90, 'Kara White', 'Math & Computer Science', 23),
(91, 'Liam Green', 'Computer Science', 20),
(92, 'Maya Black', 'Mathematics', 22),
(93, 'Nate Blue', 'Math & Computer Science', 21),
(94, 'Olga Gray', 'Computer Science', 23),
(95, 'Paul Brown', 'Mathematics', 20),
(96, 'Quincy White', 'Math & Computer Science', 22),
(97, 'Rita Green', 'Computer Science', 21),
(98, 'Steve Black', 'Mathematics', 23),
(99, 'Tina Blue', 'Math & Computer Science', 20),
(100, 'Umar Gray', 'Computer Science', 22);
```

insert 10 instructor

```
%%sql
-- insert 10 instructor
INSERT INTO Instructor (i_id, i_name, i_major) VALUES
(1, 'Dr. Brown', 'Computer Science'),
(2, 'Dr. White', 'Mathematics'),
(3, 'Dr. Green', 'Math & Computer Science'),
(4, 'Dr. Black', 'Computer Science'),
(5, 'Dr. Blue', 'Mathematics'),
(6, 'Dr. Gray', 'Math & Computer Science'),
(7, 'Dr. Red', 'Computer Science'),
(8, 'Dr. Yellow', 'Mathematics'),
(9, 'Dr. Orange', 'Math & Computer Science'),
(10, 'Dr. Purple', 'Computer Science');
```

insert 10 courses

```
%%sql
-- inserting 10 courses
```

```
INSERT INTO Course (c_id, c_name, credits, i_id) VALUES
(1, 'MachineLearning', 4, 1),
(2, 'ArtificialIntelligence', 3, 2),
(3, 'NaturalLanguageProcessing', 3, 3),
(4, 'ComputerVision', 4, 4),
(5, 'DataScience', 4, 5),
(6, 'DeepLearning', 3, 6),
(7, 'Algebra', 2, 7),
(8, 'Calculus', 3, 8),
(9, 'Probability', 2, 9),
(10, 'Statistics', 3, 10);
```

insert 100 enrollment

```
%%sql
-- insert the enrollments of the 100 student
INSERT INTO Enrollment (s_id, c_id, e_date) VALUES
(1, 1, '2023-01-15'),
(2, 2, '2023-02-10'),
(3, 3, '2023-03-05'),
(4, 4, '2023-04-20'),
(5, 5, '2023-05-12'),
(6, 6, '2023-06-18'),
(7, 7, '2023-07-22'),
(8, 8, '2023-08-30'),
(9, 9, '2023-09-14'),
(10, 10, '2023-10-25'),
(11, 1, '2023-01-20'),
(12, 2, '2023-02-15'),
(13, 3, '2023-03-10'),
(14, 4, '2023-04-25'),
(15, 5, '2023-05-17'),
(16, 6, '2023-06-23'),
(17, 7, '2023-07-27'),
(18, 8, '2023-08-31'),
(19, 9, '2023-09-19'),
(20, 10, '2023-10-30'),
(21, 1, '2023-01-25'),
(22, 2, '2023-02-20'),
(23, 3, '2023-03-15'),
(24, 4, '2023-04-30'),
(25, 5, '2023-05-22'),
(26, 6, '2023-06-28'),
(27, 7, '2023-07-31'),
(28, 8, '2023-08-31'),
(29, 9, '2023-09-24'),
(30, 10, '2023-10-31'),
(31, 1, '2023-01-30'),
(32, 2, '2023-02-25'),
```

```
(33, 3, '2023-03-20'),
(34, 4, '2023-04-30'),
(35, 5, '2023-05-27'),
(36, 6, '2023-06-30'),
(37, 7, '2023-07-31'),
(38, 8, '2023-08-31'),
(39, 9, '2023-09-29'),
(40, 10, '2023-10-31'),
(41, 1, '2023-01-31'),
(42, 2, '2023-02-28'),
(43, 3, '2023-03-25'),
(44, 4, '2023-04-30'),
(45, 5, '2023-05-31'),
(46, 6, '2023-06-30'),
(47, 7, '2023-07-31'),
(48, 8, '2023-08-31'),
(49, 9, '2023-09-30'),
(50, 10, '2023-10-31'),
(51, 1, '2023-01-31'),
(52, 2, '2023-02-28'),
(53, 3, '2023-03-31'),
(54, 4, '2023-04-30'),
(55, 5, '2023-05-31'),
(56, 6, '2023-06-30'),
(57, 7, '2023-07-31'),
(58, 8, '2023-08-31'),
(59, 9, '2023-09-30'),
(60, 10, '2023-10-31'),
(61, 1, '2023-01-31'),
(62, 2, '2023-02-28'),
(63, 3, '2023-03-31'),
(64, 4, '2023-04-30'),
(65, 5, '2023-05-31'),
(66, 6, '2023-06-30'),
(67, 7, '2023-07-31'),
(68, 8, '2023-08-31'),
(69, 9, '2023-09-30'),
(70, 10, '2023-10-31'),
(71, 1, '2023-01-31'),
(72, 2, '2023-02-28'),
(73, 3, '2023-03-31'),
(74, 4, '2023-04-30'),
(75, 5, '2023-05-31'),
(76, 6, '2023-06-30'),
(77, 7, '2023-07-31'),
(78, 8, '2023-08-31'),
(79, 9, '2023-09-30'),
(80, 10, '2023-10-31'),
(81, 1, '2023-01-31'),
```

```
(82, 2, '2023-02-28'),
(83, 3, '2023-03-31'),
(84, 4, '2023-04-30'),
(85, 5, '2023-05-31'),
(86, 6, '2023-06-30'),
(87, 7, '2023-07-31'),
(88, 8, '2023-08-31'),
(89, 9, '2023-09-30'),
(90, 10, '2023-10-31'),
(91, 1, '2023-01-31'),
(92, 2, '2023-02-28'),
(93, 3, '2023-03-31'),
(94, 4, '2023-04-30'),
(95, 5, '2023-05-31'),
(96, 6, '2023-06-30'),
(97, 7, '2023-07-31'),
(98, 8, '2023-08-31'),
(99, 9, '2023-09-30'),
(100, 10, '2023-10-31');
```

insert 100 grades

```
%%sql
-- insert grades for the 100 student
INSERT INTO Grades (counter, s_id, MachineLearning,
ArtificialIntelligence, NLPNaturalLanguageProcessing, ComputerVision,
DataScience, DeepLearning, Algebra, Calculus, Probability, Statistics)
VALUES
(1, 1, 85, 90, 88, 92, 87, 89, 78, 82, 80, 84),
(2, 2, 78, 85, 80, 88, 90, 83, 76, 79, 77, 81),
(3, 3, 92, 88, 85, 90, 91, 87, 84, 86, 83, 85),
(4, 4, 76, 82, 79, 84, 81, 80, 75, 78, 76, 79),
(5, 5, 89, 91, 87, 93, 88, 90, 85, 88, 86, 87),
(6, 6, 83, 86, 84, 89, 85, 82, 80, 83, 81, 82),
(7, 7, 77, 80, 78, 82, 79, 81, 74, 77, 75, 78),
(8, 8, 91, 93, 90, 94, 92, 89, 88, 90, 87, 89),
(9, 9, 84, 87, 85, 88, 86, 85, 82, 84, 83, 85),
(10, 10, 79, 83, 81, 85, 82, 84, 78, 81, 79, 82),
(11, 11, 88, 90, 87, 91, 89, 88, 85, 87, 86, 88),
(12, 12, 82, 85, 83, 86, 84, 83, 80, 82, 81, 83),
(13, 13, 75, 78, 76, 80, 77, 79, 72, 75, 73, 76),
(14, 14, 90, 92, 89, 93, 91, 90, 87, 89, 88, 90),
(15, 15, 86, 89, 87, 90, 88, 87, 84, 86, 85, 87),
(16, 16, 80, 84, 82, 85, 83, 84, 79, 82, 80, 83),
(17, 17, 93, 95, 92, 96, 94, 93, 90, 92, 91, 93),
(18, 18, 87, 90, 88, 91, 89, 88, 85, 87, 86, 88),
(19, 19, 81, 85, 83, 86, 84, 85, 80, 83, 81, 84),
(20, 20, 94, 96, 93, 97, 95, 94, 91, 93, 92, 94),
(21, 21, 88, 91, 89, 92, 90, 89, 86, 88, 87, 89),
```

```
(22, 22, 82, 86, 84, 87, 85, 86, 81, 84, 82, 85),
(23, 23, 76, 79, 77, 81, 78, 80, 73, 76, 74, 77),
(24, 24, 89, 92, 90, 93, 91, 90, 87, 89, 88, 90),
(25, 25, 83, 87, 85, 88, 86, 85, 82, 84, 83, 85),
(26, 26, 77, 81, 79, 82, 80, 81, 76, 79, 77, 80),
(27, 27, 92, 94, 91, 95, 93, 92, 89, 91, 90, 92),
(28, 28, 86, 89, 87, 90, 88, 87, 84, 86, 85, 87),
(29, 29, 80, 84, 82, 85, 83, 84, 79, 82, 80, 83),
(30, 30, 95, 97, 94, 98, 96, 95, 92, 94, 93, 95),
(31, 31, 89, 92, 90, 93, 91, 90, 87, 89, 88, 90),
(32, 32, 83, 87, 85, 88, 86, 85, 82, 84, 83, 85),
(33, 33, 78, 81, 79, 82, 80, 81, 76, 79, 77, 80),
(34, 34, 91, 93, 90, 94, 92, 91, 88, 90, 89, 91),
(35, 35, 85, 88, 86, 89, 87, 86, 83, 85, 84, 86),
(36, 36, 79, 83, 81, 84, 82, 83, 78, 81, 79, 82),
(37, 37, 94, 96, 93, 97, 95, 94, 91, 93, 92, 94),
(38, 38, 88, 91, 89, 92, 90, 89, 86, 88, 87, 89),
(39, 39, 82, 86, 84, 87, 85, 86, 81, 84, 82, 85),
(40, 40, 76, 79, 77, 81, 78, 80, 73, 76, 74, 77),
(41, 41, 89, 92, 90, 93, 91, 90, 87, 89, 88, 90),
(42, 42, 83, 87, 85, 88, 86, 85, 82, 84, 83, 85),
(43, 43, 77, 81, 79, 82, 80, 81, 76, 79, 77, 80),
(44, 44, 92, 94, 91, 95, 93, 92, 89, 91, 90, 92),
(45, 45, 86, 89, 87, 90, 88, 87, 84, 86, 85, 87),
(46, 46, 80, 84, 82, 85, 83, 84, 79, 82, 80, 83),
(47, 47, 95, 97, 94, 98, 96, 95, 92, 94, 93, 95),
(48, 48, 89, 92, 90, 93, 91, 90, 87, 89, 88, 90),
(49, 49, 83, 87, 85, 88, 86, 85, 82, 84, 83, 85),
(50, 50, 78, 81, 79, 82, 80, 81, 76, 79, 77, 80),
(51, 51, 91, 93, 90, 94, 92, 91, 88, 90, 89, 91),
(52, 52, 85, 88, 86, 89, 87, 86, 83, 85, 84, 86),
(53, 53, 79, 83, 81, 84, 82, 83, 78, 81, 79, 82),
(54, 54, 94, 96, 93, 97, 95, 94, 91, 93, 92, 94),
(55, 55, 88, 91, 89, 92, 90, 89, 86, 88, 87, 89),
(56, 56, 82, 86, 84, 87, 85, 86, 81, 84, 82, 85),
(57, 57, 76, 79, 77, 81, 78, 80, 73, 76, 74, 77),
(58, 58, 89, 92, 90, 93, 91, 90, 87, 89, 88, 90),
(59, 59, 83, 87, 85, 88, 86, 85, 82, 84, 83, 85),
(60, 60, 77, 81, 79, 82, 80, 81, 76, 79, 77, 80),
(61, 61, 92, 94, 91, 95, 93, 92, 89, 91, 90, 92),
(62, 62, 86, 89, 87, 90, 88, 87, 84, 86, 85, 87),
(63, 63, 80, 84, 82, 85, 83, 84, 79, 82, 80, 83),
(64, 64, 95, 97, 94, 98, 96, 95, 92, 94, 93, 95),
(65, 65, 89, 92, 90, 93, 91, 90, 87, 89, 88, 90),
(66, 66, 83, 87, 85, 88, 86, 85, 82, 84, 83, 85),
(67, 67, 78, 81, 79, 82, 80, 81, 76, 79, 77, 80),
(68, 68, 91, 93, 90, 94, 92, 91, 88, 90, 89, 91),
(69, 69, 85, 88, 86, 89, 87, 86, 83, 85, 84, 86),
(70, 70, 79, 83, 81, 84, 82, 83, 78, 81, 79, 82),
```

```
(71, 71, 94, 96, 93, 97, 95, 94, 91, 93, 92, 94),
(72, 72, 88, 91, 89, 92, 90, 89, 86, 88, 87, 89),
(73, 73, 82, 86, 84, 87, 85, 86, 81, 84, 82, 85),
(74, 74, 76, 79, 77, 81, 78, 80, 73, 76, 74, 77),
(75, 75, 89, 92, 90, 93, 91, 90, 87, 89, 88, 90),
(76, 76, 83, 87, 85, 88, 86, 85, 82, 84, 83, 85),
(77, 77, 77, 81, 79, 82, 80, 81, 76, 79, 77, 80),
(78, 78, 92, 94, 91, 95, 93, 92, 89, 91, 90, 92),
(79, 79, 86, 89, 87, 90, 88, 87, 84, 86, 85, 87),
(80, 80, 80, 84, 82, 85, 83, 84, 79, 82, 80, 83),
(81, 81, 95, 97, 94, 98, 96, 95, 92, 94, 93, 95),
(82, 82, 89, 92, 90, 93, 91, 90, 87, 89, 88, 90),
(83, 83, 83, 87, 85, 88, 86, 85, 82, 84, 83, 85),
(84, 84, 78, 81, 79, 82, 80, 81, 76, 79, 77, 80),
(85, 85, 91, 93, 90, 94, 92, 91, 88, 90, 89, 91),
(86, 86, 85, 88, 86, 89, 87, 86, 83, 85, 84, 86),
(87, 87, 79, 83, 81, 84, 82, 83, 78, 81, 79, 82),
(88, 88, 94, 96, 93, 97, 95, 94, 91, 93, 92, 94),
(89, 89, 88, 91, 89, 92, 90, 89, 86, 88, 87, 89),
(90, 90, 82, 86, 84, 87, 85, 86, 81, 84, 82, 85),
(91, 91, 76, 79, 77, 81, 78, 80, 73, 76, 74, 77),
(92, 92, 89, 92, 90, 93, 91, 90, 87, 89, 88, 90),
(93, 93, 83, 87, 85, 88, 86, 85, 82, 84, 83, 85),
(94, 94, 77, 81, 79, 82, 80, 81, 76, 79, 77, 80),
(95, 95, 92, 94, 91, 95, 93, 92, 89, 91, 90, 92),
(96, 96, 86, 89, 87, 90, 88, 87, 84, 86, 85, 87),
(97, 97, 80, 84, 82, 85, 83, 84, 79, 82, 80, 83),
(98, 98, 95, 97, 94, 98, 96, 95, 92, 94, 93, 95),
(99, 99, 89, 92, 90, 93, 91, 90, 87, 89, 88, 90),
(100, 100, 83, 87, 85, 88, 86, 85, 82, 84, 83, 85);
```

solving the problems

-- Use Cases

-- Identify students enrolled in a specific course

```
%%sql
# use ums;
select * from student
where major ='Mathematics';
```

-- Calculate the average grade for a course

```
%%sql
use ums;
select avg(MachineLearning) as ML from grades;
```

-- Update course details and track student progress

-- update statement

```
%%sql
use ums;
UPDATE course
SET credits = 2
WHERE c_id = 7;
select * from course;
```

-- select with multy conditions

```
%%sql
use ums;
select * from student
where s_id >90 or s_id <10 and age >20;
```

-- Joins

-- Perform inner joins to combine related data

```
%%sql
use ums;
select c_name,i_name from course c
join
instructor i
on c.i_id=i.i_id ;
```

-- Use left or right joins for advanced queries

```
%%sql
use ums;
select c_name,i_name from course c
left join
instructor i
on c.i_id=i.i_id ;
```

-- Multiple Joins

```
%%sql
use ums;
select s_name student,i_name instructor,c_name course
from course c
join
instructor i
on c.i_id=i.i_id
join enrollment e
```

```
on c.c_id=e.c_id
join student s
on s.s_id=e.s_id ;
```

-- Subqueries:

```
%%sql
use ums;
SELECT s.s_name student
FROM student s
JOIN grades g ON g.s_id = s.s_id
WHERE g.MachineLearning > (SELECT AVG(MachineLearning) FROM grades);
```

Python and Pandas:

1.Read Data:

Use pandas.read_sql() to load data from the database.

```
user = "root"
password = "password"
database = "ums"
conn = pymysql.connect( user=user, password=password,
database=database)

df = pd.read_sql("SELECT * FROM student", conn)
df

df1 = pd.read_sql("SELECT * FROM grades", conn)
df1

df2 = pd.read_sql("SELECT * FROM course", conn)
df2

df3 = pd.read_sql("SELECT * FROM instructor", conn)
df3
```

df4 = pd.read_sql("SELECT * FROM enrollment", conn)
df4

2. Manipulate Data:

adding column

```
df['temp']=df['age']**2
df
```

removing column

```
df.drop(columns='temp',inplace=True)
df
```

3.Indexing:

Access rows using loc and iloc for specific slicing.

```
df.loc[:,('s_name','major')]

df.iloc[:,[1,2]]
```

4.Export Data:

Export modified data using df.to_csv() or df.to_excel().

```
df.to_csv('updated.csv')
```

5.Upload All Work In Github

```
https://github.com/osamamira/DataBase-project-DEPI
```