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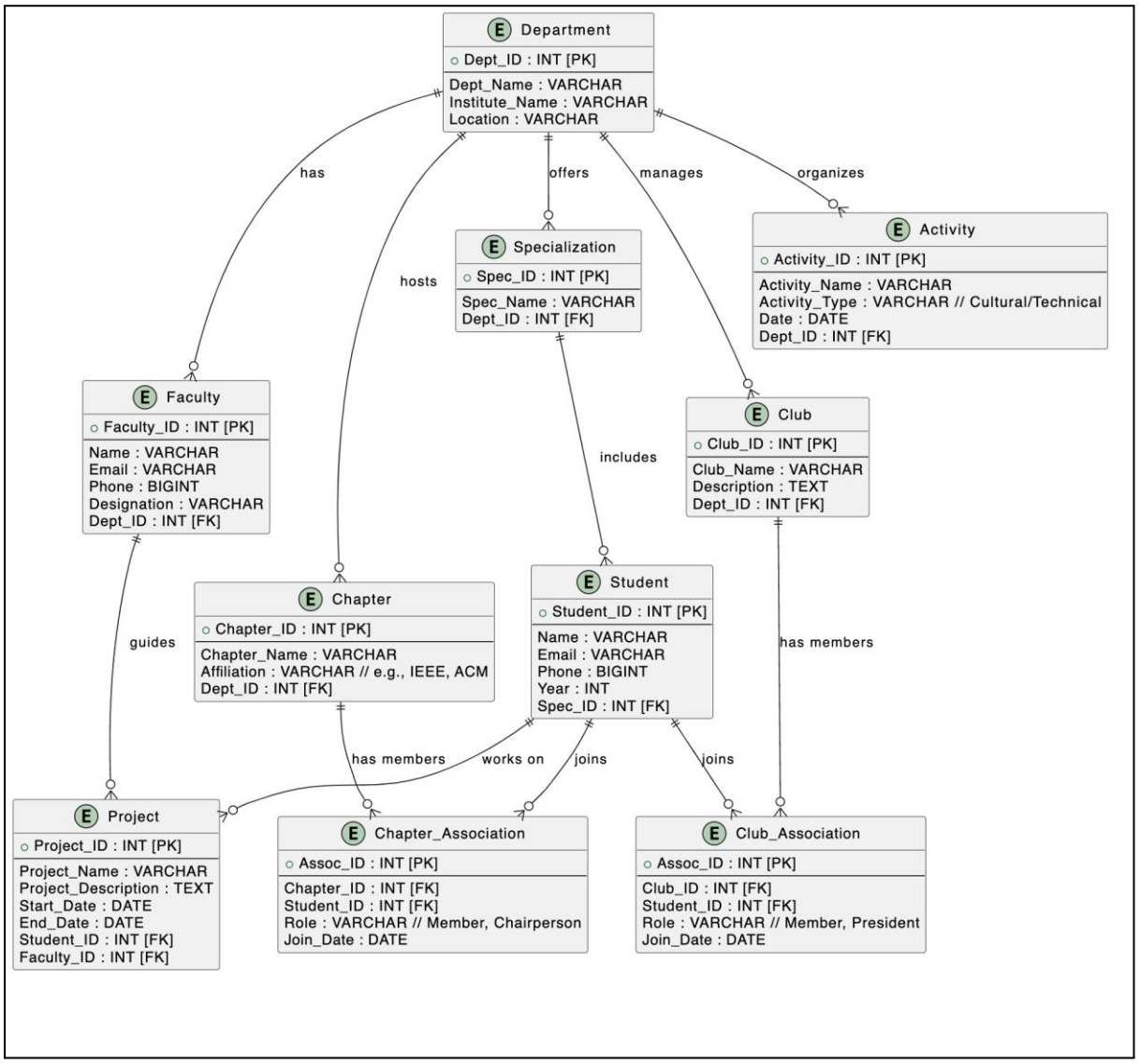
Department of Information Technology

DPBL Assignment Number: 2 (B)

Title:

Implement a database using MySQL(DDL,DML)



1. Create Department Table

```
mysql> select*from department;
+--------+-----------------------+
| DeptID | DeptName              |
+--------+-----------------------+
|      1 | Computer Science      |
|      2 | Electrical Engineering |
|      3 | Mechanical Engineering |
+--------+-----------------------+
```

2. Create Specialization Table

```
mysql> select*from specialization;
+--------+-------------------------+--------+
| SpecID | SpecName                | DeptID |
+--------+-------------------------+--------+
|      1 | Artificial Intelligence |      1 |
|      2 | Cybersecurity           |      1 |
|      3 | Power Systems           |      2 |
|      4 | Thermal Engineering     |      3 |
+--------+-------------------------+--------+
```

3. Create Student Table

```
mysql> select*from student;
+-----------+-------------+--------+
| StudentID | StudentName | SpecID |
+-----------+-------------+--------+
|         1 | Alice       |      1 |
|         2 | Bob         |      2 |
|         3 | Charlie     |      3 |
|         4 | David       |      4 |
|         5 | Emma        |      1 |
|         6 | Frank       |      2 |
+-----------+-------------+--------+
```

4. Create Faculty Table

```
mysql> select*from faculty;
+-----------+-------------+--------+
| FacultyID | FacultyName | DeptID |
+-----------+-------------+--------+
|         1 | Dr. Smith   |      1 |
|         2 | Dr. Johnson |      2 |
|         3 | Dr. Brown   |      3 |
+-----------+-------------+--------+
```

5. Create Project Table

```
mysql> select*from project;
+-----------+--------------------------+-----------+-----------+
| ProjectID | ProjectName              | StudentID | FacultyID |
+-----------+--------------------------+-----------+-----------+
|         1 | AI Chatbot               |         1 |         1 |
|         2 | Cybersecurity Framework  |         2 |         1 |
|         3 | Renewable Energy System  |         3 |         2 |
|         4 | Heat Transfer Optimization |       4 |         3 |
+-----------+--------------------------+-----------+-----------+
```

6. Create Activity Table

```
mysql> select*from activity;
+------------+--------------------+--------------+
| ActivityID | ActivityName       | ActivityYear |
+------------+--------------------+--------------+
|          1 | Hackathon          |         2024 |
|          2 | Research Symposium |         2023 |
|          3 | Industry Workshop  |         2024 |
+------------+--------------------+--------------+
```

7. Create Club Table

```
mysql> select*from club;
+--------+------------------+--------+
| ClubID | ClubName         | DeptID |
+--------+------------------+--------+
|      1 | AI Club          |      1 |
|      2 | Robotics Club    |      2 |
|      3 | Automobile Club  |      3 |
+--------+------------------+--------+
```

8. Create Chapter Table

```
mysql> select*from chapter;
+-----------+---------------------+-------------+
| ChapterID | ChapterName         | Affiliation |
+-----------+---------------------+-------------+
|         1 | IEEE Student Chapter | IEEE        |
|         2 | ACM Chapter          | ACM         |
+-----------+---------------------+-------------+
2 rows in set (0.00 sec)
```

9. Create Club_Association Table

```
mysql> Select*from club_association;
+--------+-----------+
| ClubID | StudentID |
+--------+-----------+
|      1 |         1 |
|      1 |         2 |
|      2 |         3 |
|      3 |         4 |
```

10. Create Chapter_Association Table

```
mysql> select*from chapter_association;
+-----------+-----------+
| ChapterID | StudentID |
+-----------+-----------+
|         1 |         1 |
|         2 |         2 |
```

QUERIES:

1. List all Students in a specific Specialization

```
mysql> SELECT StudentID, StudentName FROM Student WHERE SpecID = (SELECT SpecID FROM Specialization WHERE SpecName = 'Cybersecurity');
+-----------+-------------+
| StudentID | StudentName |
+-----------+-------------+
|         2 | Bob         |
|         6 | Frank       |
+-----------+-------------+
```

2. List all Projects along with their Student and Faculty Guides

```
mysql> SELECT P.ProjectID, P.ProjectName, S.StudentName, F.FacultyName
    -> FROM Project P
    -> JOIN Student S ON P.StudentID = S.StudentID
    -> JOIN Faculty F ON P.FacultyID = F.FacultyID;
+------------+-----------------------------+-------------+-------------+
| ProjectID  | ProjectName                 | StudentName | FacultyName |
+------------+-----------------------------+-------------+-------------+
|          1 | AI Chatbot                  | Alice       | Dr. Smith   |
|          2 | Cybersecurity Framework     | Bob         | Dr. Smith   |
|          3 | Renewable Energy System     | Charlie     | Dr. Johnson |
|          4 | Heat Transfer Optimization  | David       | Dr. Brown   |
+------------+-----------------------------+-------------+-------------+
```

3. List all Clubs in the Department

```
mysql> SELECT ClubID, ClubName FROM Club WHERE DeptID = (SELECT DeptID FROM Department WHERE DeptName = 'Computer Science');
+--------+----------+
| ClubID | ClubName |
+--------+----------+
|      1 | AI Club  |
+--------+----------+
```

4. List all Activities conducted in a given year

```
mysql> SELECT * FROM Activity WHERE ActivityYear = 2024;
+-------------+--------------------+--------------+
| ActivityID  | ActivityName       | ActivityYear |
+-------------+--------------------+--------------+
|           1 | Hackathon          |         2024 |
|           3 | Industry Workshop  |         2024 |
+-------------+--------------------+--------------+
```

5. List all Chapters and their affiliations

```
mysql> SELECT ChapterName, Affiliation FROM Chapter;
+----------------------+-------------+
| ChapterName          | Affiliation |
+----------------------+-------------+
| IEEE Student Chapter | IEEE        |
| ACM Chapter          | ACM         |
+----------------------+-------------+
2 rows in set (0.00 sec)
```

6. Count of Students in each Specialization

```
mysql> SELECT SpecName, COUNT(StudentID) AS StudentCount
    -> FROM Specialization
    -> LEFT JOIN Student ON Specialization.SpecID = Student.SpecID
    -> GROUP BY Specialization.SpecID, SpecName;
+------------------------+--------------+
| SpecName               | StudentCount |
+------------------------+--------------+
| Artificial Intelligence |            2 |
| Cybersecurity          |            2 |
| Power Systems          |            1 |
| Thermal Engineering    |            1 |
+------------------------+--------------+
4 rows in set (0.01 sec)
```

7. List all Students participating in a specific Club

```
mysql> SELECT S.StudentID, S.StudentName
    -> FROM Student S
    -> JOIN Club_Association CA ON S.StudentID = CA.StudentID
    -> WHERE CA.ClubID = (SELECT ClubID FROM Club WHERE ClubName = 'AI Club');
+-----------+-------------+
| StudentID | StudentName |
+-----------+-------------+
|         1 | Alice       |
|         2 | Bob         |
+-----------+-------------+
2 rows in set (0.00 sec)
```

Conclusion:

In this assignment, we implemented a database using MySQL by creating multiple tables such as Department, Specialization, Student, Faculty, Project, Activity, Club, and Chapter. We also performed various queries to retrieve meaningful data. This assignment helped in understanding DDL, DML operations, and query execution for efficient database management.