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College: PCCOE

Domain: SQL

WEEK 4 TASK

Note: I have used Oracle SQL for execution of Task.

- **Create necessary Tables:**

```
CREATE TABLE StudentDetails (
    StudentId NUMBER PRIMARY KEY,
    StudentName VARCHAR2(100),
    GPA NUMBER(3,1),
    Branch VARCHAR2(10),
    Section VARCHAR2(5)
);

CREATE TABLE SubjectDetails (
    SubjectId VARCHAR2(10) PRIMARY KEY,
    SubjectName VARCHAR2(100),
    MaxSeats NUMBER,
    RemainingSeats NUMBER
);

CREATE TABLE StudentPreference (
```

```
    StudentId NUMBER,
    SubjectId VARCHAR2(10),
    Preference NUMBER,
    PRIMARY KEY (StudentId, Preference),
    FOREIGN KEY (StudentId) REFERENCES StudentDetails(StudentId),
    FOREIGN KEY (SubjectId) REFERENCES SubjectDetails(SubjectId)
);

CREATE TABLE Allotments (
    SubjectId VARCHAR2(10),
    StudentId NUMBER,
    PRIMARY KEY (SubjectId, StudentId),
    FOREIGN KEY (SubjectId) REFERENCES SubjectDetails(SubjectId),
    FOREIGN KEY (StudentId) REFERENCES StudentDetails(StudentId)
);

CREATE TABLE UnallotedStudents (
    StudentId NUMBER PRIMARY KEY,
    FOREIGN KEY (StudentId) REFERENCES StudentDetails(StudentId)
);
```

- **Insert require Data:**

```
-- Insert student details
INSERT INTO StudentDetails VALUES (159103036, Gaurav Tanpure', 8.9, 'CCE', 'A');

-- Insert subject details
INSERT INTO SubjectDetails VALUES ('PO1491', 'Basics of Political Science', 60, 2);

-- Insert preferences for Gaurav
```

```
INSERT INTO StudentPreference VALUES (159103036, 'PO1491', 1);
INSERT INTO StudentPreference VALUES (159103036, 'PO1492', 2);
INSERT INTO StudentPreference VALUES (159103036, 'PO1493', 3);
INSERT INTO StudentPreference VALUES (159103036, 'PO1494', 4);
INSERT INTO StudentPreference VALUES (159103036, 'PO1495', 5);
```

- **Create Procedure:**

```
CREATE OR REPLACE PROCEDURE AllocateSubjects IS
   CURSOR student_cur IS
      SELECT StudentId FROM StudentDetails ORDER BY GPA DESC;

   CURSOR pref_cur(sid NUMBER) IS
      SELECT Preference, SubjectId FROM StudentPreference
      WHERE StudentId = sid ORDER BY Preference;

   v_sid StudentDetails.StudentId%TYPE;
   v_pref StudentPreference.Preference%TYPE;
   v_subid StudentPreference.SubjectId%TYPE;
   v_remaining SubjectDetails.RemainingSeats%TYPE;
   v_allotted BOOLEAN := FALSE;
BEGIN
   FOR student IN student_cur LOOP
      v_allotted := FALSE;

      FOR pref IN pref_cur(student.StudentId) LOOP
         SELECT RemainingSeats INTO v_remaining
         FROM SubjectDetails
```

```
            WHERE SubjectId = pref.SubjectId
            FOR UPDATE;

            IF v_remaining > 0 THEN
               INSERT INTO Allotments VALUES (pref.SubjectId, student.StudentId);

               UPDATE SubjectDetails
               SET RemainingSeats = RemainingSeats - 1
               WHERE SubjectId = pref.SubjectId;

               v_allotted := TRUE;
               EXIT;
            END IF;
         END LOOP;

         IF NOT v_allotted THEN
            INSERT INTO UnallotedStudents VALUES (student.StudentId);
         END IF;
      END LOOP;
   END;
   /
```

- **Call the Procedure:**

```
BEGIN
   AllocateSubjects;
END;
/
```

- **Select Allocate and Unallocated Students List:**

```
SELECT A.StudentId, S.StudentName, A.SubjectId, D.SubjectName
FROM Allotments A
JOIN StudentDetails S ON A.StudentId = S.StudentId
JOIN SubjectDetails D ON A.SubjectId = D.SubjectId
ORDER BY A.StudentId;
```

```
SQL> SELECT A.StudentId, S.StudentName, A.SubjectId, D.SubjectName
  2  FROM Allotments A
  3  JOIN StudentDetails S ON A.StudentId = S.StudentId
  4  JOIN SubjectDetails D ON A.SubjectId = D.SubjectId
  5  ORDER BY A.StudentId;

 STUDENTID
----------
STUDENTNAME
--------------------------------------------------------------------------------
SUBJECTID
----------
SUBJECTNAME
--------------------------------------------------------------------------------
 159103036
Gaurav Tanpure
PO1491
DBMS
```

```
SELECT U.StudentId, S.StudentName

FROM UnallotedStudents U

JOIN StudentDetails S ON U.StudentId = S.StudentId

ORDER BY U.StudentId;
```