TASK 5

Writing Join Queries, Equivalent, and/or Recursive Queries  
(Tool: SQL/Oracle, ALM: Flipped Classroom)

# Aim:

To perform the advanced query processing and test its heuristics using designing of optimal correlated and nested sub-queries such as finding summary statistics.

## 5.1 Retrieve all universities and their departments

SQL> SELECT u.Name AS University, d.Name AS Department FROM University u JOIN Department d ON u.UnivID = d.UnivID;

|  |  |
| --- | --- |
| University | Department |
| Chennai University | Computer Science |
| Chennai University | Information Technology |
| Tiruvallur University | Mechanical Engineering |
| Tiruvallur University | Civil Engineering |
| Trichy University | Electrical Engineering |
| Viluppuram University | Electronics |
| Madurai University | Biotechnology |
| Tuticorin University | Physics |
| Selam University | Chemistry |
| Tiruppur University | Mathematics |

## 5.2 List all exams along with the departments and their heads

SQL> SELECT e.Exam\_Date, e.TimeSlot, e.ExamID, d1.Name AS Department1, d1.Head AS Dept1\_Head, d2.Name AS Department2, d2.Head AS Dept2\_Head FROM Exam e JOIN Department d1 ON e.DeptID1 = d1.DeptID JOIN Department d2 ON e.DeptID2 = d2.DeptID;

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Exam\_Date | TimeSlot | ExamID | Department1 | Dept1\_Head | Department2 | Dept2\_Head |
| 22-JUN-2022 | Morning | E01 | Computer Science | Dr. Ramesh | Mechanical Engineering | Dr. Kumar |
| 22-JUN-2022 | Afternoon | E02 | Information Technology | Dr. John | Civil Engineering | Dr. George |
| 24-JUN-2022 | Morning | E03 | Electrical Engineering | Dr. Muthu | Mechanical Engineering | Dr. Kumar |
| 25-JUN-2022 | Afternoon | E04 | Electrical Engineering | Dr. Muthu | Civil Engineering | Dr. George |
| 04-APR-2023 | Morning | E05 | Chemistry | Dr. Hari | Information Technology | Dr. John |

## 5.3 Count the number of exams conducted by each department

SQL> SELECT d.Name AS Department, COUNT(e.DeptID1) AS ExamsConducted FROM Department d LEFT JOIN Exam e ON d.DeptID = e.DeptID1 GROUP BY d.Name;

|  |  |
| --- | --- |
| Department | ExamsConducted |
| Computer Science | 1 |
| Mechanical Engineering | 0 |
| Information Technology | 1 |
| Chemistry | 1 |
| Mathematics | 0 |
| Biotechnology | 0 |
| Electronics | 0 |
| Electrical Engineering | 2 |
| Physics | 0 |
| Civil Engineering | 0 |

## 5.4 Find all students from the department named "Civil Engineering"

SQL> SELECT s.StudentID, s.Name, s.DeptID, d.Dean, d.Head FROM Student s JOIN Department d ON s.DeptID = d.DeptID WHERE d.Name = Civil Engineering;

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| StudentID | Name | DeptID | Dean | Head |
| 102 | Akash | TUV02 | Dr. Kannan | Dr. George |
| 112 | Prem Kumar | TUV02 | Dr. Kannan | Dr. George |

## 5.5 Retrieve all department details, including the count of exams passed by each department

SQL> SELECT d.DeptID, d.Name AS DepartmentName, d.Dean, d.Head, COUNT(e.ExamID) AS PassedExamCount FROM Department d LEFT JOIN Exam e ON d.DeptID = SUBSTR(e.Result,1,5) GROUP BY d.DeptID, d.Name, d.Dean, d.Head;

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| DeptID | DepartmentName | Dean | Head | PassedExamCount |
| CUB01 | Computer Science | Dr. Ramesh | Dr. Kumar | 1 |
| CUB02 | Information Technology | Dr. Karthik | Dr. John | 0 |
| MUB01 | Biotechnology | Dr. Saravanan | Dr. Sunil | 0 |
| SUB01 | Chemistry | Dr. Somu | Dr. Hari | 0 |
| TUB01 | Mechanical Engineering | Dr. Babu | Dr. John | 2 |
| TUV02 | Civil Engineering | Dr. Kannan | Dr. George | 0 |
| TUR01 | Mathematics | Dr. Anand | Dr. Mathan | 0 |
| TRUB01 | Electrical Engineering | Dr. Paul | Dr. Muthu | 0 |
| TUCB01 | Physics | Dr. Alex | Dr. Barathi | 0 |
| VUB01 | Electronics | Dr. Rajeshkumar | Dr. Manimaran | 0 |

## 5.6 Retrieve the total number of 'Tie' exam results in a department-wise manner

SQL> SELECT d.Name AS DepartmentName, COUNT(\*) AS TotalTieExams FROM Department d JOIN Exam\_Result er ON d.DeptID = er.DeptID WHERE er.Result = 'Tie' GROUP BY d.Name;

|  |  |
| --- | --- |
| DepartmentName | TotalTieExams |
| Electrical Engineering | 1 |

## 5.7 Retrieve the department details that achieved exam passes

SQL> SELECT \* FROM Department WHERE DeptID IN (SELECT er.DeptID FROM Exam\_Result er WHERE er.Result = 'Pass');

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| DeptID | UnivID | Name | Dean | Head |
| CUB01 | UID01 | Computer Science | Dr. Ramesh | Dr. Kumar |
| TUB01 | UID02 | Mechanical Engineering | Dr. Babu | Dr. John |
| TRUB01 | UID04 | Electrical Engineering | Dr. Paul | Dr. Muthu |

## 5.8 Retrieve students and exam details for those older than 25

SQL> SELECT s.StudentID, s.Name AS StudentName, s.Age, e.ExamID, e.Exam\_Date, e.TimeSlot, e.Result FROM Student s, Exam e WHERE s.StudentID IN (SELECT StudentID FROM Student WHERE Age > 25);

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| StudentID | StudentName | Age | ExamID | Exam\_Date | TimeSlot | Result |
| 1 | Raj | 27 | E01 | 22-JUN-2022 | Morning | TUB01 - PASS |
| 1 | Raj | 27 | E02 | 22-JUN-2022 | Afternoon | CUB01 - PASS |
| 1 | Raj | 27 | E03 | 24-JUN-2022 | Morning | TUB01 - PASS |
| 1 | Raj | 27 | E04 | 25-JUN-2022 | Afternoon | TRUB01 - PASS |
| 1 | Raj | 27 | E05 | 04-APR-2023 | Morning | Tie |

## 5.9 Retrieve details of departments that have not conducted any exams

SQL> SELECT \* FROM Department WHERE DeptID NOT IN (SELECT DeptID1 FROM Exam UNION SELECT DeptID2 FROM Exam);

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| DeptID | UnivID | Name | Dean | Head |
| VUB01 | UID03 | Electronics | Dr. Rajeshkumar | Dr. Manimaran |
| MUB01 | UID05 | Biotechnology | Dr. Saravanan | Dr. Sunil |
| TUCB01 | UID06 | Physics | Dr. Alex | Dr. Barathi |
| TUR01 | UID08 | Mathematics | Dr. Anand | Dr. Mathan |

## 5.10 Retrieve DeptID, UnivID, DeptName, and StudentName for a particular StudentID

SQL> SELECT d.DeptID, d.UnivID, d.Name, s.Name AS StudentName FROM Department d JOIN Student s ON d.DeptID = s.DeptID WHERE s.StudentID = '66';

|  |  |  |  |
| --- | --- | --- | --- |
| DeptID | UnivID | Name | StudentName |
| VUB01 | UID03 | Electronics | Ganesh |

Result:

Thus, the query using join queries, equivalent, and/or recursive queries has been done successfully.