CSCD 327 Lab 7

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1 Find Above Average Departments

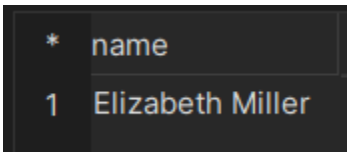
```sql
SELECT department_name
FROM Departments
WHERE annual_budget > (
  SELECT AVG(annual_budget)
  FROM Departments
)
```

*	department_name
1	Computer Science
2	Electrical Engineering
3	Biotechnology

Figure 1: Finding above average departments

2 Find Best Paid Prof

```sql
SELECT name FROM Professors
WHERE salary = (
  SELECT MAX(salary)
  FROM Professors
)
```



*	name
1	Elizabeth Miller

Figure 2: Finding best paid professor

3 Find Small Grants

```sql
SELECT project_title FROM Projects
WHERE grant_amount < (
  SELECT MAX(grant_amount) FROM Projects
  WHERE end_year < 2024
)
ORDER BY project_title
```

*	project_title
1	Advanced Circuit Design
2	AI for Healthcare
3	Algebraic Topology
4	Computer Vision
5	Cybersecurity Frameworks
6	Embedded Systems
7	Hydraulics & Robotics
8	Machine Learning Optimization
9	Renewable Energy
10	Robotics Automation
11	Statistical Modeling
12	Thermodynamics Simulation

Figure 3: Finding small grants

4 Find Max Average Salary

```sql
SELECT ROUND(MAX(avgSalary), 2) AS maxAvg
FROM (
  SELECT AVG(salary) AS avgSalary
  FROM Professors
  GROUP BY department_id
) AS T
```

*	maxAvg
1	121500.00

Figure 4: Finding max average salary

5 Find Bored Profs

```sql
SELECT name FROM Professors
WHERE professor_id NOT IN (
  SELECT professor_id
  FROM Assignments
)
ORDER BY name
```

*	name
1	Benjamin Taylor
2	Hannah Anderson
3	Lucas Thompson
4	Nathan Clark
5	Sophia Martinez

Figure 5: Finding bored professors

6 Find Mid Departments

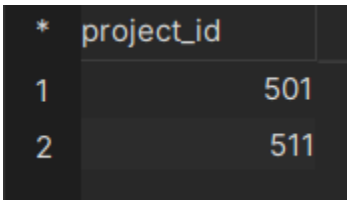
```sql
SELECT department_name FROM Departments
WHERE annual_budget NOT IN (
  SELECT MAX(annual_budget) FROM Departments
  UNION
  SELECT MIN(annual_budget) FROM Departments
)
```

*	department_name
1	Electrical Engineering
2	Mechanical Engineering
3	Biotechnology

Figure 6: Finding mid budget departments

7 Find Assignments with professors 11 and 12

```sql
SELECT project_id
FROM Assignments
WHERE professor_id IN (11, 12)
GROUP BY project_id
HAVING COUNT(DISTINCT professor_id) >= 2;
```



*	project_id
1	501
2	511

Figure 7: Finding projects assigned to both professors 11 and 12

8 Find Titles for previous query

```sql
SELECT project_title
FROM Assignments NATURAL JOIN Projects
WHERE professor_id IN (11, 12)
GROUP BY project_id
HAVING COUNT(DISTINCT professor_id) >= 2;
```

*	project_title
1	AI for Healthcare
2	Natural Language Processing

Figure 8: Finding titles of projects assigned to both professors 11 and 12

9 Find Projects with the most publications

```sql
WITH maxCount(v) AS (
  SELECT MAX(pubCount) as maxCount
  FROM (
        SELECT COUNT(*) AS pubCount
        FROM Publications
        GROUP BY project_id
   ) AS PubCounts
)
SELECT project_id
FROM (
  SELECT project_id, COUNT(*) AS pubCount
  FROM Publications
  GROUP BY project_id
) AS T, maxCount
WHERE T.pubCount = maxCount.v
```

*	project_id
1	501
2	512
3	513
4	514
5	515
6	516
7	517
8	518
9	519
10	520

Figure 9: Finding projects with the most publications

10 Find Best Paid Profs By Dept

```sql
SELECT name FROM (
  SELECT department_id, AVG(salary) avgSalary
  FROM Professors
  GROUP BY department_id
) AS AvgSalaries NATURAL JOIN Professors P
WHERE salary > avgSalary
ORDER BY name
```

*	name
1	Benjamin Taylor
2	David Lee
3	Elizabeth Miller
4	John Smith
5	Joseph Allen
6	Li Wang
7	Lucas Thompson
8	Olivia Wilson
9	Samuel Walker
10	Victoria Robinson

Figure 10: Finding best paid professors by department

11 Find Most Demanding Projects

```sql
WITH projAvgHours AS (
  SELECT project_id, ROUND(Avg(hours), 2) AS avgHours
  FROM (
    SELECT project_id, SUM(hours_allocated) AS hours
    FROM Assignments
    GROUP BY project_id, professor_id
  ) AS T
  GROUP BY project_id
),
maxAvg AS (
  SELECT MAX(avgHours) AS maxHours
  FROM projAvgHours
)
SELECT project_title
FROM projAvgHours A
JOIN maxAvg M
  ON A.avgHours = M.maxHours
NATURAL JOIN Projects P
```

*	project_title
1	Embedded Systems

Figure 11: Finding most demanding projects

12 Find Over 500s

```sql
WITH projAvgHours AS (
  SELECT project_id, ROUND(Avg(hours), 2) AS avgHours
  FROM (
    SELECT project_id, SUM(hours_allocated) AS hours
    FROM Assignments
    GROUP BY project_id, professor_id
  ) AS T
  GROUP BY project_id
)
SELECT COUNT(*) AS projCount
FROM projAvgHours
WHERE avgHours > 500
```

*	projCount
1	5

Figure 12: Finding projects with average hours over 500