

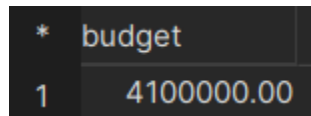
CSCD 327 Lab 6

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1 Find the average budget for the departments

```
1 SELECT ROUND(avg(annual_budget), 2) AS budget
2 FROM Departments;
```



	* budget
1	4100000.00

Figure 1: Finding average budget for departments

2 Find the average budget for the departments

```
1 Select MIN(grant_amount) AS MinGrant, MAX(grant_amount) AS MaxGrant
2 FROM Projects
3 WHERE start_year <= 2023;
```

*	MinGrant	MaxGrant
1	800000.00	3000000.00

Figure 2: Finding min and max grants for projects in 2023 or earlier

3 Professors Without Projects

```
1 SELECT name FROM Professors P LEFT OUTER JOIN Assignments A ON A.  
   professor_id = P.professor_id  
2 WHERE project_id IS NULL  
3 ORDER BY name;
```



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

Figure 3: Finding professors without projects

4 Average Citations By Year

```
1 SELECT publication_year, ROUND(AVG(citations), 2) AS  
   AveragePublications  
2 FROM Publications  
3 GROUP BY publication_year  
4 ORDER BY publication_year;
```

*	publication_year	AveragePublications
1	2021	150.00
2	2022	86.67
3	2023	120.00
4	2024	105.00

Figure 4: Finding average citations by year

5 Find Total Prof Hours

```
1 SELECT professor_id, SUM(hours_allocated) AS total_hours
2 FROM Professors NATURAL JOIN Assignments
3 WHERE professor_id < 20
4 GROUP BY professor_id
5 ORDER BY total_hours DESC;
```

*	professor_id	total_hours
1	11	1650
2	19	1300
3	17	1270
4	15	1100
5	18	900
6	13	880
7	14	810
8	12	650
9	16	570

Figure 5: Finding total hours for professors

6 Average Salary By Department

```
1 SELECT department_name, COUNT(professor_id) AS prof_count, ROUND(AVG(  
    salary), 2) AS avg_salary  
2 FROM Departments NATURAL JOIN Professors  
3 GROUP BY department_id;
```

*	department_name	prof_count	avg_salary
1	Computer Science	5	116600.00
2	Electrical Engineering	4	121500.00
3	Mechanical Engineering	4	114250.00
4	Biotechnology	4	107250.00
5	Mathematics	3	110666.67

Figure 6: Finding average salary

7 Publications By Project

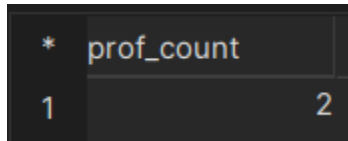
```
1 SELECT project_title, COUNT(publication_id) AS pubs
2 FROM Projects NATURAL JOIN Publications
3 WHERE end_year <= 2024
4 GROUP BY project_id;
```

*	project_title	pubs
1	Cybersecurity Frameworks	1
2	Smart Grid Systems	1
3	Robotics Automation	1
4	Algebraic Topology	1
5	Computer Vision	2
6	Embedded Systems	2

Figure 7: Finding publications by project

8 Quantum Professors

```
1 SELECT COUNT(*) AS prof_count
2 FROM Professors
3     NATURAL JOIN Assignments
4     NATURAL JOIN Projects
5 WHERE project_title = 'Quantum Computing';
```



*	prof_count
1	2

Figure 8: Finding professors in Quantum Computing project

9 Biotech Projects

```
1 SELECT COUNT(*) AS proj_count ,
2     ROUND(AVG(grant_amount), 2) AS avg_grant
3 FROM Professors
4     NATURAL JOIN Projects
5     NATURAL JOIN Departments
6 WHERE department_name = 'Biotechnology';
```

*	proj_count	avg_grant
1	16	2312500.00

Figure 9: Finding biotech projects and average grant amounts

10 Profs By Project

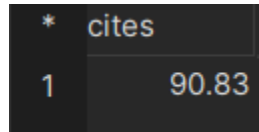
```
1 SELECT project_title ,
2     COUNT(*) AS prof_count ,
3     ROUND(AVG(citations), 2) AS avg_cites
4 FROM Projects
5     NATURAL JOIN Assignments
6     NATURAL JOIN Publications
7 GROUP BY project_id;
```

*	project_title	prof_count	avg_cites
1	AI for Healthcare	4	107.50
2	Cybersecurity Frameworks	1	80.00
3	Smart Grid Systems	1	150.00
4	Autonomous Vehicles	1	60.00
5	Genetic Engineering	1	200.00
6	Quantum Computing	2	50.00
7	Renewable Energy	1	110.00
8	Robotics Automation	1	140.00
9	Cancer Research	1	75.00
10	Algebraic Topology	1	40.00
11	Natural Language Processing	2	65.00
12	Machine Learning Optimization	4	95.00
13	Advanced Circuit Design	4	92.50
14	Thermodynamics Simulation	4	100.00
15	CRISPR Applications	4	215.00
16	Statistical Modeling	4	82.50
17	Computer Vision	4	107.50
18	Embedded Systems	4	127.50
19	Hydraulics & Robotics	2	97.50
20	Bioinformatics Analysis	2	150.00

Figure 10: Finding professors by project and average citations

11 John Smith Citations

```
1 SELECT ROUND(AVG(citations), 2) AS cites
2 FROM Professors
3     NATURAL JOIN Assignments
4     NATURAL JOIN Publications
5 WHERE name = 'John Smith'
```



*	cites
1	90.83

Figure 11: Finding average citations for John Smith

12 Recent Publications

```
1 SELECT department_name, MAX(publication_year) recent
2 FROM Publications
3     NATURAL JOIN Projects
4     NATURAL JOIN Departments
5 WHERE department_name = 'Computer Science' OR department_name = '
6     Mathematics'
7 GROUP BY department_name
```

*	department_name	recent
1	Computer Science	2024
2	Mathematics	2023

Figure 12: Finding recent publications by department