

# CS 370: Chapter 3 SQL Practice

## Database Name: University

### Basic Data Retrieval

1. Select all columns from the department table.

```
SELECT * FROM department;
```

2. Find courses that offer more than 3 credits.

```
Select * FROM course where credits > 3;
```

### Data Aggregation

3. Count the number of courses offered by each department and display the department name and the course count.

```
SELECT dept_name, COUNT(*) AS course_count  
FROM course  
GROUP BY dept_name;
```

4. List departments with budgets over \$100,000, including the department name and its budget.

```
SELECT dept_name, budget  
FROM department  
WHERE budget > 100000;
```

### Advanced Queries

5. Select all departments that have more than 3 instructors.

```
SELECT d.dept_name  
FROM department d  
JOIN instructor i ON d.dept_name = i.dept_name  
GROUP BY d.dept_name  
HAVING COUNT(*) > 2;
```

6. List all courses that do not have any prerequisites.

```
SELECT c.title
FROM course c
LEFT JOIN prereq p ON c.course_id = p.course_id
WHERE p.course_id IS NULL;
```

7. Find departments whose budgets are below the average budget of all departments. Display the department name and its budget.

```
SELECT dept_name, budget
FROM department
WHERE budget < (SELECT AVG(budget) FROM department);
```

8. Find the total number of students enrolled in each course for the Spring semester of 2018.

```
SELECT course_id, COUNT(*) AS total_students
FROM takes
WHERE semester = 'Spring' AND year = 2018
GROUP BY course_id;
```

9. Identify the course(s) that offer the most credit hours. Display the course title and the number of credits.

```
SELECT title, credits
FROM course
WHERE credits = (SELECT MAX(credits) FROM course);
```

10. Find the highest-paid instructor in each department, including the department name, instructor name, and salary.

```
SELECT d.dept_name, i.name, i.salary
FROM instructor i
JOIN department d ON i.dept_name = d.dept_name
WHERE (i.dept_name, i.salary) IN
      (SELECT dept_name, MAX(salary) FROM instructor GROUP BY
dept_name);
```