RDBMS TASK 1 ANSWERS

TASK 1: UNIVERSITY TASK

Q.1: Find the Total Number of Students in Each Department.

```
SELECT department_name,
COUNT(students.student_id) AS Totalstudents
FROM students JOIN departments ON
students.department_id=departments.department_id
GROUP BY departments.department_name
```

Q.2 : List All Courses Taught by a Specific Professor

```
SELECT courses.course_name, professors.first_name
FROM courses
JOIN professors ON courses.professor_id = professors.professor_id
WHERE professors.first_name = 'Arvind';
```

Q.3 : Find the Average Grade of Students in Each Course

```
SELECT AVG(
   CASE
        WHEN enrollments.grade = 'A' THEN 3
        WHEN enrollments.grade = 'B' THEN 2
        WHEN enrollments.grade = 'C' THEN 1
        ELSE 0
   END)
 AS Average_grades FROM enrollments
JOIN courses ON enrollments.course_id = courses.course_id
GROUP by courses.course_id
```

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Q. 4. List All Students Who Have Not Enrolled in Any Courses.

```
SELECT students.student_id, students.first_name, students.last_name
FROM students
LEFT JOIN enrollments ON students.student_id = enrollments.student_id
WHERE enrollments.enrollment_id is null
```

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Q.5 Find the Number of Courses Offered by Each Department

```
SELECT course_name,
COUNT(courses.course_id) as courses_by_department
FROM courses
JOIN departments ON courses.course_id = departments.department_id
GROUP BY courses.course_name
```

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Q.6 List All Students Who Have Taken a Specific Course (e.g., 'Database Systems')

```
SELECT first_name,last_name,courses.course_name,
COUNT(students.student_id) FROM students
```

```
JOIN courses ON students.department_id = courses.department_id

GROUP BY courses.course_name

WHERE courses.course_name = "Linear algebra"
```

Q.7 Find the Most Popular Course Based on Enrollment Numbers

```
SELECT courses.course_name, COUNT(enrollments.enrollment_id) AS enrollment_count

FROM courses

JOIN enrollments ON courses.course_id = enrollments.course_id

GROUP BY courses.course_id, courses.course_name

ORDER BY enrollment_count DESC

LIMIT 1;
```

Q.8 Find the Average Number of Credits Per Student in a Department.

```
SELECT departments.department_name, AVG(courses.credits) AS average_credits

from students

JOIN departments ON students.department_id = departments.department_id

JOIN enrollments ON students.student_id = enrollments.student_id

JOIN courses ON enrollments.course_id= courses.course_id

GROUP BY departments.department_name
```

Q.9 List All Professors Who Teach in More Than One Department.

```
SELECT DISTINCT p.first_name, p.last_name, COUNT(d.department_name) AS department_count, d.department_name from professors p

JOIN courses ON courses.professor_id = p.professor_id
JOIN departments d ON courses.department_id = d.department_id
GROUP BY p.professor_id
HAVING COUNT(DISTINCT d.department_id)>1
```

Q.10 Get the Highest and Lowest Grade in a Specific Course (e.g., 'Operating Systems')

```
SELECT
   CASE
      WHEN MAX(CASE
            WHEN enrollments.grade = 'A' THEN 3
            WHEN enrollments.grade = 'B' THEN 2
            WHEN enrollments.grade = 'C' THEN 1
            ELSE 0
          END) = 3 THEN 'A'
      WHEN MAX(CASE
            WHEN enrollments.grade = 'A' THEN 3
            WHEN enrollments.grade = 'B' THEN 2
            WHEN enrollments.grade = 'C' THEN 1
            ELSE 0
          END) = 2 THEN 'B'
      WHEN MAX(CASE
            WHEN enrollments.grade = 'A' THEN 3
            WHEN enrollments.grade = 'B' THEN 2
            WHEN enrollments.grade = 'C' THEN 1
            ELSE 0
         END) = 1 THEN 'C'
    ELSE 'None'
END AS maximum_grade,
CASE
    WHEN MIN(CASE
            WHEN enrollments.grade = 'A' THEN 3
            WHEN enrollments.grade = 'B' THEN 2
            WHEN enrollments.grade = 'C' THEN 1
            ELSE 0
         END) = 3 THEN 'A'
    WHEN MIN(CASE
            WHEN enrollments.grade = 'A' THEN 3
            WHEN enrollments.grade = 'B' THEN 2
            WHEN enrollments.grade = 'C' THEN 1
            ELSE 0
         END) = 2 THEN 'B'
    WHEN MIN(CASE
            WHEN enrollments.grade = 'A' THEN 3
            WHEN enrollments.grade = 'B' THEN 2
            WHEN enrollments.grade = 'C' THEN 1
            ELSE 0
            END) = 1 THEN 'C'
        ELSE 'None'
    END AS minimum_grade
FROM enrollments
JOIN courses ON enrollments.course_id = courses.course_id
WHERE courses.course_name = 'Robotics'
```