**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

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**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

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**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

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**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'