ASSIGNMENT 2 (19 MARCH)

Make sure to insert suitable records in the table, such that there exists at least 2 records for

each query.

1. Retrieve the names of all instructors who teach at least one course in the 'Computer Science' department.

select instructor.name from instructor where instructor.id in(select teaches.id from teaches where course\_id in (select course\_id from course where dept\_name = 'Comp. Sci.'));

2. List all students who have taken at least one course in 'Fall' and 'Spring' semesters in the same year.

select distinct p.id from takes as p , takes as q

where p.id = q.id and p.year = q.year and (p.semester = 'Fall' and q .semester = 'Spring');

3. Find all classrooms that have a capacity of more than 100 but are not assigned to any section.

select room\_number from classroom

where capacity > 100 and (building , room\_number) not in (select section.building,section.room\_number from section);

4. Display all courses along with their prerequisites, including courses that have no

Prerequisites.

select course.course\_id , prereq\_id from prereq right join course on course.course\_id = prereq.course\_id ;

5. Retrieve the list of instructors who have never taught a course.

6. Find the total budget allocated to all departments that have at least one instructor

earning more than ₹100,000.

7. Find the average salary of instructors grouped by department but only include

departments with more than 5 instructors.

8. Find the total number of students enrolled in each course for every semester, and sort by

semester and number of students (descending).

9. Determine which department has the highest average course credit.

10. Find the top 3 courses with the most students enrolled across all semesters.

11. Find all students who have taken every course taught by the instructor 'John Doe'

.

12. Retrieve the names of students who have the same name as their advisor.

13. Find all instructors who have taught at least one course that they did not belong to the

department of.

14. List all students who have taken a course in a classroom that has a capacity less than

the number of students enrolled.

15. Find students who have taken every course offered by their department.

16. Identify the department(s) with the largest number of distinct courses offered.

17. Find students who have taken a course but have not received a grade.

18. Retrieve the details of instructors who have the exact same salary as another instructor.

19. Identify all courses that have prerequisites, but the prerequisite itself has no prerequisite.

20. Find all students who have taken courses in every semester (Fall, Winter, Spring,

Summer) at least once.

21. Find all prerequisite chains for a given course (i.e., if A is a prerequisite for B, and B is a

prerequisite for C, return A → B → C).

22. List all courses that have at least two levels of prerequisites (i.e., a prerequisite has

another prerequisite).

23. Find the shortest prerequisite chain for any course that eventually leads to a specific

course, say 'CS101'

.

24. Identify students who have taken a course whose prerequisite they have never taken.

25. Find all instructors who have taught a course that has another course as a prerequisite.

26. Find all students who have the same total credits as another student in a different

department.

27. Identify instructors who have the highest salary in their department but still earn less

than the highest salary in another department.

28. Retrieve students who have taken more than one course but have failed at least half of

them (assuming grade 'F' is failing).29. List all departments where the highest-paid instructor earns more than the total

department budget divided by the number of instructors.

30. Find courses that have never been taught in the same semester for consecutive years.

31. Rank instructors by salary within their department and return only the second-highest

salary in each department.

32. Find students who have taken the most credits in a single semester.

33. Retrieve the top 5 students with the highest total credits, including ties.

34. Determine which instructors have taught the most unique courses.

35. Find students who have received the highest grade (alphabetically) in the most number

of distinct courses.

36. Find all students who have taken courses in the 'Computer Science' and 'Mathematics'

departments but not in 'Physics'

.

37. List students who have taken every course in their department except for one course.

38. Find all instructors who have taught at least one course in every semester.

39. Retrieve students who have the same advisor but are from different departments.

40. Find courses that are prerequisites for some courses but are also taken by students who

have never taken the main course.

41. Increase the salary of instructors who have taught more than 5 courses by 10%.

42. Remove students who have never taken any courses and have no advisor assigned.

43. Assign an advisor to every student who does not have one, choosing the instructor from

the same department with the highest salary.

44. Update the grade of students who initially received 'F' but later retook the same course

and scored higher.

45. Delete all courses that have not been offered in the last 10 years.

46. Find the instructor who has taught a course in the largest number of unique classrooms.

47. Determine the department with the most students who have taken at least one course

but have zero total credits recorded.

48. Identify courses where the number of students who failed is greater than those who

passed.

49. Find the classroom that has hosted the highest number of distinct courses across all

semesters.

50. Retrieve students who have been enrolled in at least one course every year for at least 4

consecutive years.