Database Fundamentals
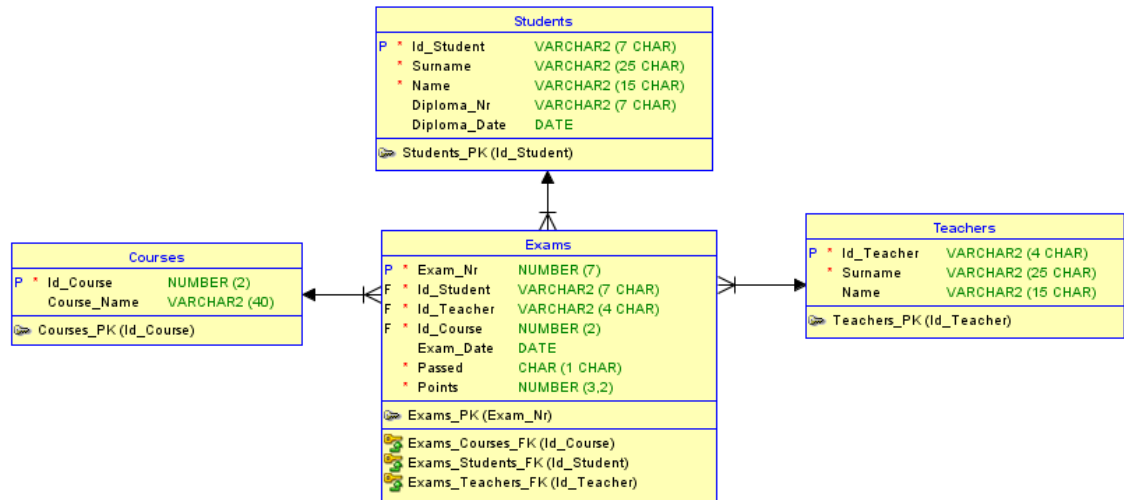
SQL Tasks

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I. Database used for SQL queries

There are the following tables you have to use to solve the tasks defined the next chapters:

- *Teachers* – persons who assess the exams,
- *Students* – people who take the exam,
- *Courses* – area of education that has to be completed by passing an exam,
- *Exams* – an exam from the course.

II. SQL Tasks

1. Select all students whose surname is *Smith*. Display student ID, name and surname. Sort the result set by surname in descending order.

2. Display the course name that contains the character string "*data*".

3. Select all exams that have been passed. Display student ID, course ID and number of points obtained by student from this exam. Sort the result set using student ID and course ID (both in ascending order).

4. Select courses that have been completed (a positive result of the exam) by all students whose surname is *Smith*. Display student ID, name, surname, and course name.

5. Select teachers who assessed the exams from the course "*Data warehouses*". Display teacher ID, name and surname. Sort the result set using teacher's surname.

6. Which students took an exam and did not passed an exam? Display student ID, name and surname, and sort the result set by student's surname in descending order.

7. Who among students did not take any exam, yet? Display his/her student ID, name and surname. Sort the result set by student ID.

8. Which student has been assessed (taking an exam) by the teacher whose surname is *Muryjas*. For each teacher with this surname, display student ID, student name and surname.

9. How many exams have been passed by the students? Consider in the result set only those students who took an exam. Display student ID, name, surname, and a number of exams. Apply the label "*Number of exams*" for the last column. Sort the result set by the number of exams in descending order.

10. How many exams have been passed by every student? Consider in the result set all students. Display student ID, name, surname, and a number of exams. Apply the label "*Number of exams*" for the last column. Sort the result set by the number of exams in ascending order.

11. How many points have been collected by every student who took at least one exam? Display student ID, name, surname, and the total number of points. Apply an appropriate label to the last column. Sort the result set using the last column applying a descending order.

12. Which student passed an exam and collected more than 50 points? Display student ID, name and surname. Apply sorting by number of points in the descending order.

13. What is the date of the last exam taken by every student? Take into consideration all students. Display student ID, name, surname, and the date of this exam. Sort result set using student ID and descending order.

14. How many exams have been taken for each course? Display the name of the course and the number of exams. Apply appropriate label for the second column.

15. How many students have taken exams from particular courses? Consider only those courses for which there is at least one exam. Display the name of the course and the number of students. Apply appropriate label for the second column.

16. How many teachers assessed exams from particular courses? Display the course name and the number of teachers. Apply appropriate label for the second column. Sort data using the second column and use the descending order.

17. How many exams have been taken in particular years? Display year number and the number of exams. Apply appropriate labels for both columns. Sort the result set using the first column (descending order). To help you to solve this task I recommend you to use the function EXTRACT.

18. How many exams have been taken in particular months of particular years? Display year number, month number, and the number of exams. Apply appropriate labels for all displayed columns. Sort the result set using the first and second column (ascending order). To help you to solve this task I recommend you to use the function EXTRACT.

19. For each year, select the teacher who assessed more than 100 exams. Display year number, teacher ID, name and surname, and the number of exams. Apply appropriate labels for the first and fifth column. Sort data using these columns. To help you to solve this task I recommend you to use the function EXTRACT.

20. For each month of each year, select the teacher who assessed more than 8 students. Display year number, month number, teacher ID, name and surname, and the number of assessed students. Apply appropriate labels for the first, second and sixth column. Sort two first columns. To help you to solve this task I recommend you to use the function EXTRACT.

21. Which course has been assessed on the last day of exams? Display the date and the name of the course. Use an appropriate label for both columns. Use subquery to solve this task.

22. Which students have passed an exam from the course "Database fundamentals" on the day that was the last day of exams of this course? Display Id student, name and surname. Sort results set by student ID. Use subquery to solve this task.

23. Which teacher has assessed the greatest number of exams? Display teacher ID, name and surname. Sort the result set by teacher surname. Which teacher has assessed the greatest number of exams? Display teacher ID, name and surname. Sort the result set by teacher surname. Use subquery to solve this task.

24. Indicate the course for which there is the greatest number of exams. Display the course name. Sort the result set by course name. Use subquery to solve this task.

25. Indicate the student who has passed the greatest number of exams. Display student ID, name and surname. Sort the result set by student surname. Use subquery to solve this task.

26. Display the year number for which there was the greatest number of exams. Use subquery to solve this task.

27. Which course has been passed by every student on the last her/his exam? Take into consideration only those students who took at least one exam. Display student ID, name and surname, as well as course name. Sort the result set by student ID. Use subquery to solve this task.

28. Which student has been assessed by particular teachers as the last one? Display teacher ID, name, and surname as well as student ID, name, and surname. Sort the result set by teacher surname and student surname. Use subquery to solve this task.

29. Which student has been assessed the most times by particular teachers? Display teacher ID, name, and surname as well as student ID, name, and surname. Sort the result set by teacher surname and student surname. Use subquery to solve this task.

30. For each student, find the completed course from which the student received the greatest number of points. Display student ID, surname, name, and course name. Sort the result set by student surname. Use subquery to solve this task.

31. Which teacher assessed the greatest number of exams in particular years? For each year, display teacher ID, surname, name, and the number of exams for this teacher. Sort the result set using year and teacher surname. Use subquery to solve this task.

32. Which student took the greatest number of exams in particular years? For each year, display student ID, surname, name, and the number of taken exams by this student. Sort the result set using year and student surname. Use subquery to solve this task.

33. In which month of particular years there was the greatest number of exams? For each year, display the month number of a year. Sort the result set by the year. Use subquery to solve this task.