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Advanced data Technologies

Lab 4

1. **(First&Mandatory for everyone)** Create a view containing all fields of table STUDENT together with the average grade (field AVG\_GRADE) of each student. Name the view STUD\_GRADES.

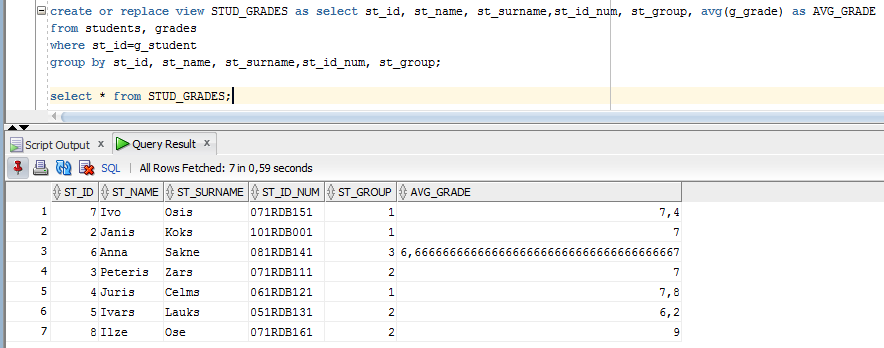
create or replace view STUD\_GRADES as select st\_id, st\_name, st\_surname,st\_id\_num, st\_group, avg(g\_grade) as AVG\_GRADE

from students, grades

where st\_id=g\_student

group by st\_id, st\_name, st\_surname,st\_id\_num, st\_group;

select \* from STUD\_GRADES;



Join tables then group by the displayed columns and add the average.

1. (Easy) Find how many group mates each student has.

select st\_id, st\_name, st\_surname, st\_group, (select count(

b.st\_id)

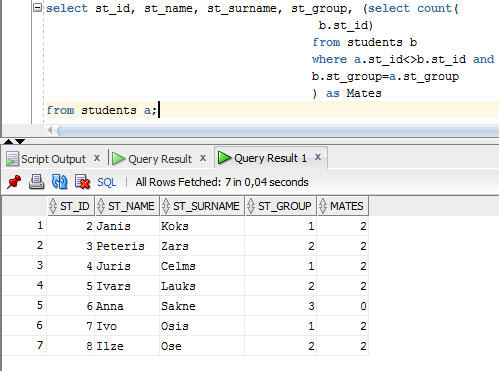
from students b

where a.st\_id<>b.st\_id and

b.st\_group=a.st\_group

) as Mates

from students a;



Select the count of rows that correspond to the same group and a different id.

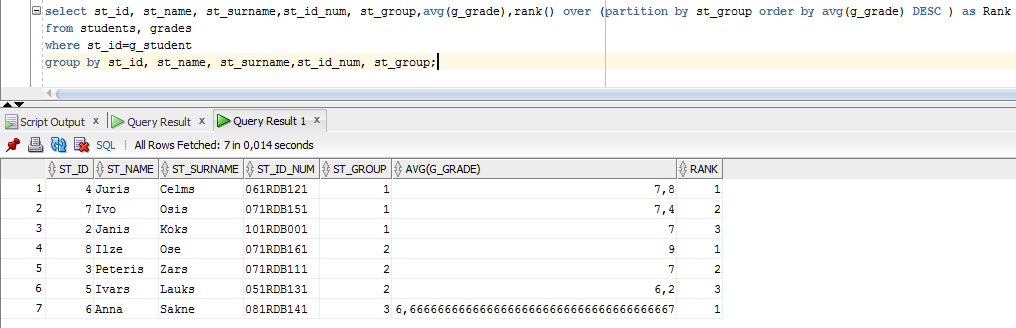
1. (Easy) Assign ranks to students of each group by average grade. Student having the highest average grade in each group receives rank 1, the second one receives rank 2, and so on.

select st\_id, st\_name, st\_surname,st\_id\_num, st\_group,avg(g\_grade),rank() over (partition by st\_group order by avg(g\_grade) DESC ) as Rank

from students, grades

where st\_id=g\_student

group by st\_id, st\_name, st\_surname,st\_id\_num, st\_group;



Join tables then group by needed displayed columns and use function rank() over a partition of rows using st\_group column and order in descendant order.

1. (Easy) Find the difference between each student’s average grade and the best average grade in his group.

select st\_id, st\_name, st\_surname,st\_id\_num, st\_group,avg(g\_grade), first\_value(avg(g\_grade)) over (

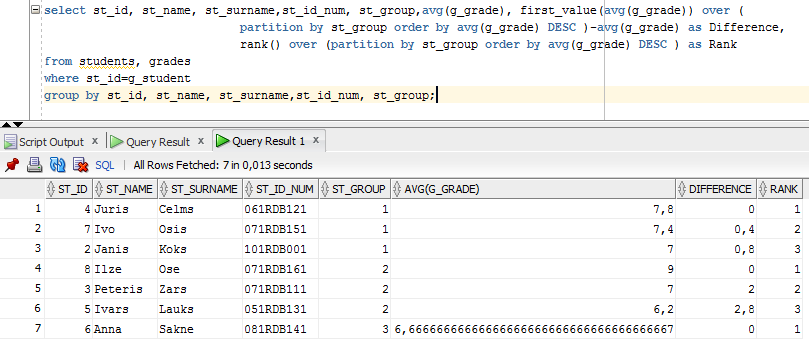
partition by st\_group order by avg(g\_grade) DESC )-avg(g\_grade) as Difference,

rank() over (partition by st\_group order by avg(g\_grade) DESC ) as Rank

from students, grades

where st\_id=g\_student

group by st\_id, st\_name, st\_surname,st\_id\_num, st\_group;



First join tables then use function first\_value() with partition over st\_group to find the best average grade in this group and compute the difference with the average grade.

1. (Medium) For each student find
   1. Number of students that have at least the same average grade as he/she has.

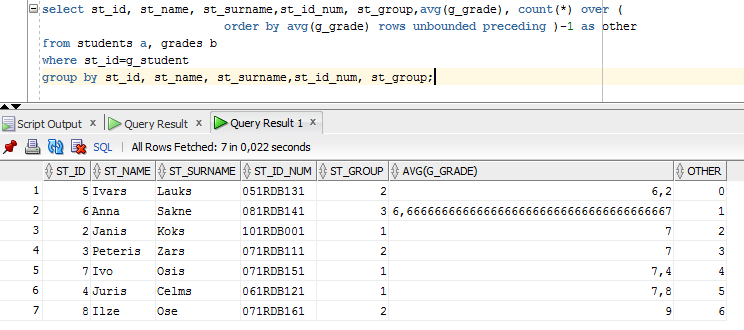
select st\_id, st\_name, st\_surname,st\_id\_num, st\_group,avg(g\_grade), count(\*) over (

order by avg(g\_grade) rows unbounded preceding )-1 as other

from students a, grades b

where st\_id=g\_student

group by st\_id, st\_name, st\_surname,st\_id\_num, st\_group;

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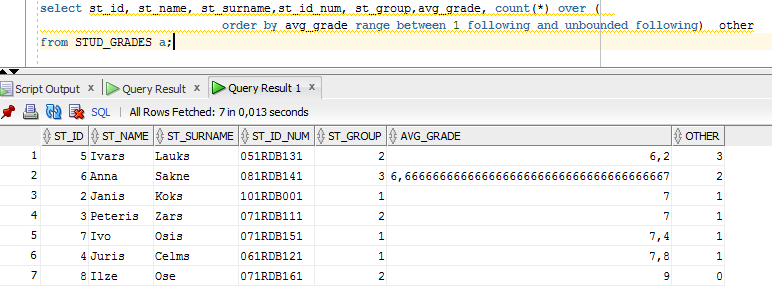
Join tables then group by needed displayed columns and count rows that are contained between the current average grade and the lower ones minus 1 not to count the current rows.

* 1. Number of the students that have average grade higher than their average grade by at least 1 mark.

select st\_id, st\_name, st\_surname,st\_id\_num, st\_group,avg\_grade, count(\*) over (

order by avg\_grade range between 1 following and unbounded following) other

from STUD\_GRADES a;



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By using STUD\_GRADES view, count the number of rows that are between the current row -1 and the following ordering by grade average.

1. (Medium) Find which grades differ the most from the corresponding teacher’s average grade.

create or replace view TEA\_GRADES as select T\_ID, T\_NAME, T\_TITLE, avg(g\_grade) as AVG\_GRADE

from teachers, grades, courses

where c\_id=g\_course and

c\_teacher=t\_id

group by T\_ID, T\_NAME, T\_FIRSTNAME, T\_TITLE;

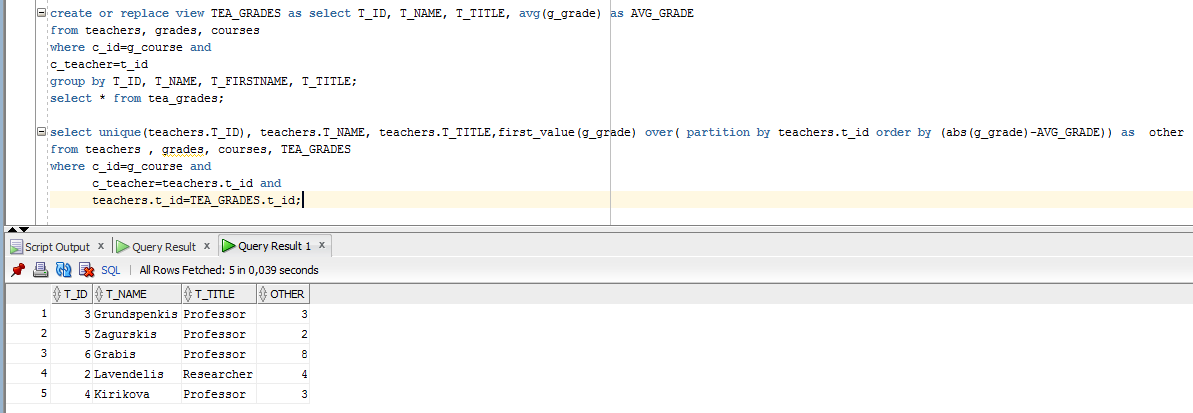
select unique(teachers.T\_ID), teachers.T\_NAME, teachers.T\_TITLE,first\_value(g\_grade) over( partition by teachers.t\_id order by (abs(g\_grade)-AVG\_GRADE)) as other

from teachers , grades, courses, TEA\_GRADES

where c\_id=g\_course and

c\_teacher=teachers.t\_id and

teachers.t\_id=TEA\_GRADES.t\_id;



First create a view displaying mark average by teacher then join this view with needed tables. Use the rank() function to select the first row of the partition by teachers ordering by the difference of their grades and their average grade.

1. (Hard) How many days after the first exam of each student was passed were the other exams passed by him?
2. (Hard) Find which grades differ more than 1 mark from the highest grade of the corresponding student.
3. (Hard) Divide students into four groups by their average nark. The first 25% of students have to be assigned to the first group, the second ones to the second and so on.