1. What is grouping?
2. When would you use grouping?

In SQL, grouping is the process of combining rows in a table based on the values of columns, and then most often applying an aggregate function (such as SUM, COUNT, AVG, MAX, or MIN) to the data in each group. The result is a set of summary data that shows the total or average for each group, rather than the individual values for each row.

We would use grouping to summarize data and answer questions about the data in a table. For example, if you have a table of students, course ids, and grades, you could use a grouping query to see the average grade in a particular course.

Grouping is useful for generating reports and visualizations that summarize large amounts of data, as well as for analyzing data to identify trends and patterns. It can help database users gain insights into their data and make more informed decisions based on the data. Data visualization is a whole field unto itself and in my opinion is very interesting. It’s one thing to have a ton of data but another to be able to actually use it.

I think examples help me understand a lot of the concepts we learn in this class, so I will present the following example table:

student\_id | course\_id | grade

-----------|-----------|-------

1 | 101 | 85

2 | 101 | 90

3 | 102 | 70

4 | 102 | 80

5 | 102 | 90

This SQL query will group the rows in the "student\_grades" table by the "course\_id" column, and then calculate the average grade for each group using the AVG function. The result set will include two columns: "course\_id" and "avg\_grade". For example, if the table contains the following data:

SELECT course\_id, AVG(grade) as avg\_grade

FROM student\_grades

GROUP BY course\_id;

course\_id | avg\_grade

----------|-----------

101 | 87.5

102 | 80

This shows the average grade for each course, which can be useful for analyzing student performance and identifying areas where additional support or resources may be needed.

Resources used:

<https://www.tutorialgateway.org/sql-grouping-function/>

<https://www.simplilearn.com/tutorials/sql-tutorial/group-by-in-sql>

<https://www.w3schools.com/sql/sql_groupby.asp>