1. **What are joins in SQL? State its types.**
2. **Define Cross join.**

A **join** in SQL is used to combine rows from two or more tables based on a related column between them. Joins allow us to retrieve data from multiple tables in a relational database.

**Types of Joins:**

1. **Inner Join**:
   - Returns only the rows where there is a match between the columns in both tables.
   - Syntax:

     SELECT columns
     FROM table1
     INNER JOIN table2 ON table1.column = table2.column;

2. **Left Join (or Left Outer Join)**:
   - Returns all rows from the left table and the matching rows from the right table. If there is no match, NULL values are returned for columns from the right table.
   - Syntax:

     SELECT columns
     FROM table1
     LEFT JOIN table2 ON table1.column = table2.column;

3. **Right Join (or Right Outer Join)**:
   - Returns all rows from the right table and the matching rows from the left table. If there is no match, NULL values are returned for columns from the left table.
   - Syntax:

     SELECT columns
     FROM table1
     RIGHT JOIN table2 ON table1.column = table2.column;

4. **Full Join (or Full Outer Join)**:

o Returns all rows when there is a match in either table. Rows without a match are included with NULLs for missing data.
o Syntax:

SELECT columns
FROM table1
FULL JOIN table2 ON table1.column = table2.column;

5. **Cross Join**:
   o Combines every row from the first table with every row from the second table, resulting in the Cartesian product.
   o Syntax

SELECT columns

FROM table1
CROSS JOIN table2;

6. **Self Join**:
   o A table is joined with itself. Used when comparing rows within the same table.
   o Syntax:

SELECT a.column1, b.column2
FROM table1 a, table1 b
WHERE a.some_column = b.some_column;

**Definition of Cross Join:**

A **Cross Join** in SQL produces a Cartesian product of the two tables involved. This means every row from the first table is combined with every row from the second table. It is often used when all combinations of data are needed or to generate test data.