### SQL JOINs

Joining tables using SQL.

SELECT A.<col_1>, B.<col_2> FROM <table_1> AS A INNER JOIN <table_2> AS B ON A.<col_2> = B.<col_3> - Join two tables and extract the intersect of the records matching the ON condition.

SELECT A.<col_1>, B.<col_2> FROM <table_1> AS A FULL OUTER JOIN <table_2> AS B ON A.<col_2> = B.<col_3> - Join two tables and extract all of the records matching the ON condition from both tables.

SELECT A.<col_1>, B.<col_2> FROM <table_1> AS A LEFT OUTER JOIN <table_2> AS B ON A.<col_2> = B.<col_3> - Join two tables and extract all the records from the left table and the matching records from the right table.

SELECT A.<col_1>, B.<col_2> FROM <table_1> AS A CROSS JOIN <table_2> AS B - Repeat the values from the right table for each record in the left table. Should be used with caution as it can quickly explode in size.
### SQL Unary Functions

SQL functions operating on a single parameter or column.

- **SELECT <col_1>, COUNT(*) AS cnt FROM <table> GROUP BY <col_1>** - Count records for each value in a column.
- **SELECT <col_1>, AVG(<col_2>) AS col_2_avg FROM <table> GROUP BY <col_1>** - Calculate an average of a column for each value in another column.
- **SELECT <col_1>, SUM(<col_2>) AS col_2_sum FROM <table> GROUP BY <col_1>** - Calculate a sum of a column for each value in another column.
- **SELECT <col_1>, MIN(<col_2>) AS col_2_min FROM <table> GROUP BY <col_1>** - Extract the minimum value of a column for each value in another column.
- **SELECT <col_1>, MAX(<col_2>) AS col_2_max FROM <table> GROUP BY <col_1>** - Extract the maximum of a column for each value in another column.
- **SELECT <col_1>, STDDEV(<col_2>) AS col_2_stddev FROM <table> GROUP BY <col_1>** - Calculate a standard deviation of a column for each value in another column.
- **SELECT <col_1>, VARIANCE(<col_2>) AS col_2_var FROM <table> GROUP BY <col_1>** - Calculate a variance of a column for each value in another column.
- **SELECT <col_1>, COALESCE(<col_1>,<col_2>) FROM <table>** - Substitute missing observations in one column with values from another column.
- **SELECT RAND(<seed>) FROM <table>** - Generate random values between 0 and 1.
- **SELECT POWER(<col>, <N>) FROM <table>** - Raise the values in a column to a specified power.
- **SELECT SQRT(<col>) FROM <table>** - Calculate the square root of the values in the column.
- **SELECT REVERSE(<col>) FROM <table>** - Reverse the string to read backwards.
- **SELECT CHAR_LENGTH(<col>) FROM <table>** - Find the length of a string.
- **SELECT TRIM(<col>) FROM <table>** - Trim empty characters from the left or right of a string.
- **SELECT SUBSTRING(<col>,<start_char>,<char_count>) FROM <table>** - Extract a substring from every value in the column.
- **SELECT DAYOFWEEK(<col>) FROM <table>** - Extract a day of the week from a DateTime column.
- **SELECT DAY(<col>) FROM <table>** - Extract day component from a DateTime column.
- **SELECT HOUR(<col>) FROM <table>** - Extract hour component from a DateTime column.
- **SELECT MINUTE(<col>) FROM <table>** - Extract minute component from a DateTime column.
- **SELECT SECOND(<col>) FROM <table>** - Extract second component from a DateTime column.
- **SELECT YEAR(<col>) FROM <table>** - Extract year from a DateTime column.
- **SELECT MONTH(<col>) FROM <table>** - Extract month from a DateTime column.
- **SELECT DAYOFMONTH(<col>) FROM <table>** - Extract a day of a month from a DateTime column.
- **SELECT COUNT(*) AS cnt FROM <table> GROUP BY <col_1>** - Count records for each value in a column.
- **SELECT <col_1>=<col_2> FROM <table>** - Check which values in a column do not equal the values in another column.
- **SELECT <col_1><col_2> FROM <table>** - Check which values in a column are greater than or equal to values in another column.
- **SELECT <col_1><col_2> FROM <table>** - Check which values in a column are less than or equal to values in another column.
- **SELECT <col_1><col_2> FROM <table>** - Check which values in a column are greater than or equal to values in another column.
- **SELECT COALESCE(<col_1>,<col_2>) FROM <table>** - Substitute missing observations in one column with values from another column.

### SQL Binary Functions

SQL functions operating on two parameters or columns.

- **SELECT <col_1> + <col_2> FROM <table>** - Add values of two columns together.
- **SELECT <col_1> - <col_2> FROM <table>** - Subtract values in one column from the other.
- **SELECT <col_1> * <col_2> FROM <table>** - Multiply values of two columns together.
- **SELECT <col_1> / <col_2> FROM <table>** - Divide values in one column by the values in the other column.
- **SELECT MOD(<col>, <N>) FROM <table>** - Calculate the remainder of a division by a number.
- **SELECT POWER(<col>, <N>) FROM <table>** - Raise the values in a column to a specified power.
- **SELECT REPLACE(<col>, <string_to_replace>, <string_to_replace_with>) FROM <table>** - Replace string from values in the column with another string.
- **SELECT UPPER(<col>) FROM <table>** - Convert all characters in a string to uppercase.
- **SELECT LOWER(<col>) FROM <table>** - Convert all characters in a string to lowercase.
- **SELECT REVERSE(<col>) FROM <table>** - Reverse the string to read backwards.

### SQL String Functions

SQL functions operating on string columns.

- **SELECT <col_1> || <col_2> FROM <table>** - Concatenate strings from different columns.
- **SELECT CHAR_LENGTH(<col>) FROM <table>** - Find the length of a string.
- **SELECT SUBSTRING(<col>,<start_char>,<char_count>) FROM <table>** - Extract a substring from every value in the column.
- **SELECT LEFT(<col>, <char_count>) FROM <table>** - Extract a substring from the left from every value in the column.
- **SELECT RIGHT(<col>, <char_count>) FROM <table>** - Extract a substring from the right from every value in the column.
- **SELECT LTRIM(<col>) FROM <table>** - Trim empty characters from the left of a string.
- **SELECT RTRIM(<col>) FROM <table>** - Trim empty characters from the right of a string.
- **SELECT REPLACE(<col>, <string_to_replace>, <string_to_replace_with>) FROM <table>** - Replace string from values in the column with another string.

### SQL Datetime Functions

SQL functions operating on DateTime columns.

- **SELECT YEAR(<col>) FROM <table>** - Extract year from a DateTime column.
- **SELECT MONTH(<col>) FROM <table>** - Extract month from a DateTime column.
- **SELECT DAY(<col>) FROM <table>** - Extract day component from a DateTime column.
- **SELECT HOUR(<col>) FROM <table>** - Extract hour component from a DateTime column.
- **SELECT MINUTE(<col>) FROM <table>** - Extract minute component from a DateTime column.
- **SELECT SECOND(<col>) FROM <table>** - Extract second component from a DateTime column.
- **SELECT DAYOFWEEK(<col>) FROM <table>** - Extract a day of the week from a DateTime column.

### SQL Functions on a Two Parameters or Columns

SQL functions operating on a two parameters or columns.

- **SELECT <col_1> + <col_2> FROM <table>** - Add values of two columns together.
- **SELECT <col_1> - <col_2> FROM <table>** - Subtract values in one column from the other.
- **SELECT <col_1> * <col_2> FROM <table>** - Multiply values of two columns together.
- **SELECT <col_1> / <col_2> FROM <table>** - Divide values in one column by the values in the other column.
- **SELECT MOD(<col>, <N>) FROM <table>** - Calculate the remainder of a division by a number.
- **SELECT POWER(<col>, <N>) FROM <table>** - Raise the values in a column to a specified power.
- **SELECT REPLACE(<col>, <string_to_replace>, <string_to_replace_with>) FROM <table>** - Replace string from values in the column with another string.