Arithmetic operations in SQL

- We can perform arithmetic in SQL using the operators **+, -, *, /** .
- However, in SQL we can only perform arithmetic **across columns** on values in a given row.
  - To clarify, we can only add values in multiple columns from the same row together using +.
- If we want to add values across multiple rows, we need to use SQL aggregate functions.

```
SELECT cust_name, opening_amt, receive_amt, (opening_amt + receive_amt)
FROM customer
WHERE (opening_amt + receive_amt)>15000;
```

SQL Aggregate Functions

1. **COUNT** counts how many rows are in a particular column.

2. **SUM** adds together all the values in a particular column.

3. **MIN** and **MAX** return the lowest and highest values in a particular column, respectively.

4. **AVG** calculates the average of a group of selected values.

SQL COUNT

1. Counting all rows (including NULL)

- The **COUNT(*)** function counts the total rows in the table, **including the NULL** values.

```
SELECT COUNT(*) AS number_of_rows
FROM orders;
```

2. Counting individual columns

- **COUNT(column name)** will count all the rows in the specified column while **excluding NULL** values.

```
SELECT COUNT(order_id) AS number_of_orders
FROM orders;
```

- **COUNT (DISTINCT column_name)** will count only **distinct (unique) rows** in the defined column.

```
SELECT COUNT(DISTINCT customer_id) AS number_of_customers
FROM orders;
```

3. Counting non-numerical columns

- One nice thing about COUNT is that you can use it on **non-numerical columns**:

```
SELECT COUNT(date) AS count_of_date
FROM orders
```

SQL SUM

1. SUM totals the values in a given column.

2. Unlike COUNT, we can only use SUM on columns containing numerical values.

```
SELECT SUM(quantity)
FROM orders
```

SQL MIN/MAX

1. MIN and MAX functions return the lowest and highest values in a particular column.

2. They're similar to COUNT in that they can be used on non-numerical columns.

```
SELECT MIN(quantity) AS min_quantity,
           MAX(quantity) AS max_quantity
FROM orders
```

SQL AVG

- AVG calculates the average of a selected group of values.

- It's very useful, but has some **limitations**:
  1. First, it can only be used on numerical columns
  2. Second, it ignores NULL entries completely.

```
SELECT AVG(quantity)
     FROM orders
```