

Summarizing data

INTERMEDIATE SQL



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Summarizing data

- Aggregate functions return a single value



Aggregate functions

AVG() , SUM() , MIN() , MAX() , COUNT()

```
SELECT AVG(budget)  
FROM films;
```

```
| avg           |  
| ----- |  
| 39902826.2684... |
```

```
SELECT SUM(budget)  
FROM films;
```

```
| sum           |  
| ----- |  
| 181079025606 |
```

Aggregate functions

```
SELECT MIN(budget)  
FROM films;
```

```
| min |  
| --- |  
| 218 |
```

```
SELECT MAX(budget)  
FROM films;
```

```
| max |  
| ----- |  
| 1221550000 |
```

Non-numerical data

Numerical fields only

- `AVG()`
- `SUM()`

Various data types

- `COUNT()`
- `MIN()`
- `MAX()`

Non-numerical data

MIN() <-> MAX()

Minimum <-> Maximum

Lowest <-> Highest

A <-> Z

1715 <-> 2022

0 <-> 100

Non-numerical data

```
SELECT MIN(country)  
FROM films;
```

```
| min      |  
| ----- |  
| Afghanistan |
```

```
SELECT MAX(country)  
FROM films;
```

```
| max      |  
| ----- |  
| West Germany |
```

Aliasing when summarizing

```
SELECT MIN(country)  
FROM films;
```

```
|min      |  
|-----|  
|Afghanistan|
```

```
SELECT MIN(country) AS min_country  
FROM films;
```

```
|min_country|  
|-----|  
|Afghanistan|
```

Let's practice!

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Summarizing subsets

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SQL

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Using WHERE with aggregate functions

```
SELECT AVG(budget) AS avg_budget  
FROM films  
WHERE release_year >= 2010;
```

```
|avg_budget |  
|-----|  
|41072235.18324607...|
```

Using WHERE with aggregate functions

```
SELECT SUM(budget) AS sum_budget  
FROM films  
WHERE release_year = 2010;
```

```
|sum_budget|  
|-----|  
|8942365000|
```

```
SELECT MIN(budget) AS min_budget  
FROM films  
WHERE release_year = 2010;
```

```
|min_budget|  
|-----|  
|65000|
```

Using WHERE with aggregate functions

```
SELECT MAX(budget) AS max_budget  
FROM films  
WHERE release_year = 2010;
```

```
|max_budget|  
|-----|  
|600000000 |
```

```
SELECT COUNT(budget) AS count_budget  
FROM films  
WHERE release_year = 2010;
```

```
|count_budget|  
|-----|  
|194 |
```

ROUND()

- Round a number to a specified decimal

```
SELECT AVG(budget) AS avg_budget  
FROM films  
WHERE release_year >= 2010;
```

```
|avg_budget |  
|-----|  
|41072235.18324607...|
```

```
ROUND(number_to_round, decimal_places)
```

```
SELECT ROUND(AVG(budget), 2) AS avg_budget  
FROM films  
WHERE release_year >= 2010;
```

```
|avg_budget |  
|-----|  
|41072235.18|
```

ROUND() to a whole number

```
SELECT ROUND(AVG(budget)) AS avg_budget  
FROM films  
WHERE release_year >= 2010;
```

```
|avg_budget|  
|-----|  
|41072235 |
```

```
SELECT ROUND(AVG(budget), 0) AS avg_budget  
FROM films  
WHERE release_year >= 2010;
```

```
|avg_budget|  
|-----|  
|41072235 |
```

ROUND() using a negative parameter

```
SELECT ROUND(AVG(budget), -5) AS avg_budget  
FROM films  
WHERE release_year >= 2010;
```

```
|avg_budget|  
|-----|  
|41100000 |
```

- Numerical fields only

Let's practice!

INTERMEDIATE SQL

Aliasing and arithmetic

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Arithmetic

+ , - , * , and /

```
SELECT (4 + 3);
```

|7|

```
SELECT (4 * 3);
```

|12|

```
SELECT (4 - 3);
```

|1|

```
SELECT (4 / 3);
```

|1|

Arithmetic

```
SELECT (4 / 3);
```

```
|1|
```

```
SELECT (4.0 / 3.0);
```

```
|1.333...|
```

Aggregate functions vs. arithmetic

Aggregate functions

title	ticket_price	fees	tax
The Host	5	1	0.5
The Mask	5	1	0.5
Titanic	6	2	0.6

Arithmetic

title	ticket_price	fees	tax
The Host	5	1	0.5
The Mask	5	1	0.5
Titanic	6	2	0.6

Aliasing with arithmetic

```
SELECT (gross - budget)  
FROM films;
```

```
|?column?|  
|-----|  
|null   |  
|2900000|  
|null   |  
...  
...
```

```
SELECT (gross - budget) AS profit  
FROM films;
```

```
|profit  |  
|-----|  
|null   |  
|2900000|  
|null   |  
...  
...
```

Aliasing with functions

```
SELECT MAX(budget), MAX(duration)  
FROM films;
```

```
| max      | max |  
| ----- | -- |  
| 12215500000 | 334 |
```

```
SELECT MAX(budget) AS max_budget,  
      MAX(duration) AS max_duration  
FROM films;
```

```
| max_budget | max_duration |  
| ----- | ----- |  
| 12215500000 | 334 |
```

Order of execution

- Step 1: `FROM`
- Step 2: `WHERE`
- Step 3: `SELECT` (aliases are defined here)
- Step 4: `LIMIT`
- Aliases defined in the `SELECT` clause cannot be used in the `WHERE` clause due to order of execution

```
SELECT budget AS max_budget  
FROM films  
WHERE max_budget IS NOT NULL;
```

```
column "max_budget" does not exist  
LINE 5: WHERE max_budget IS NOT NULL;
```

^

Let's practice!

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