# What is SQL (pronounced 'See-kwel')?

**Structured Query Language (SQL)** is a programming language designed to manipulate and extract data from a Relational Database Management System (RDBMS)

- Invented in the early 1970's at IBM and based on relational algebra

- Became and American National Standards Institute (ANSI) standard in 1986 and in International Standards Organization (ISO) standard in 1987

**Queries** are pieces of code that retrieve data from database tables

**Data Manipulation** or **Data Definition** operations are used to create or alter the database itself

Different, proprietary versions of the language exist, but most are almost identical in basic syntax;

- This makes knowledge of SQL a highly transferable skill

- This is good, since in the real world it's the workhorse behind data analytics

- It's also a remarkably simple language, particularly relative to its power

# SQL – Basic Functions

| | |
|---|---|
| SELECT | |
| FROM | |
| WHERE | |
| GROUP BY | |
| HAVING | |
| ORDER BY | |

# SQL – The SELECT Statement & FROM Clause

| SELECT | Defines which attributes / columns / fields I want to retrieve or calculate |
|--------|------------------------------------------------------------------------------|
| FROM   | Identifies the table from which I want to extract information |

```
SELECT FIELD_1, FIELD_2, ..., FIELD_N
FROM TABLE_NAME

SELECT FIELD_1, FIELD_2, ..., FIELD_N FROM TABLE_NAME
```

**TRANSACTIONS**

| Transaction_ID | Customer_Id | Channel | Product | Price | Discount |
|----------------|-------------|---------|---------|-------|----------|
| 1000123 | 60067 | Web | Book | 9.95 | |
| 1000124 | 12345 | Store | Book | 11.95 | |
| 1000125 | 23451 | Store | DVD | 14.95 | |
| 1000126 | 70436 | Reseller | DVD | 19.95 | 5 |
| 1000127 | 66772 | Store | Magazine | 3.25 | |
| 1000128 | 60067 | Web | Book | 29.95 | |
| 1000129 | 72045 | Web | DVD | 9.95 | |
| 1000130 | 82371 | Reseller | Magazine | 2.5 | 0.25 |
| 1000131 | 12345 | Store | Book | 7.95 | |

# SQL – The SELECT Statement & FROM Clause

```sql
SELECT CHANNEL, PRODUCT, PRICE
FROM TRANSACTIONS
```

| Channel | Product | Price |
|---------|---------|-------|
| Web | Book | 9.95 |
| Store | Book | 11.95 |
| Store | DVD | 14.95 |
| Reseller | DVD | 19.95 |
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# SQL – The SELECT Statement & FROM Clause

**Special Case – What if I want to select ALL columns / fields?**

- Could type them all out in the SELECT statement, but tedious

- Instead, use the 'wildcard' character *
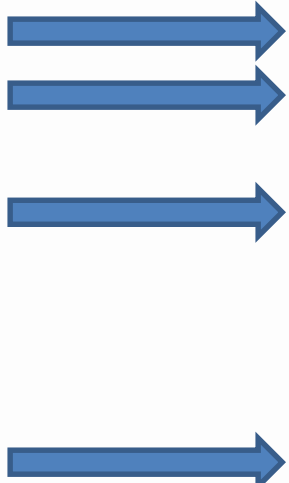
```
SELECT *
FROM TABLE_NAME
```

# SQL – The WHERE Clause

| WHERE | Adds filters that restrict what rows / records are retrieved |
|-------|-------------------------------------------------------------|

WHERE <logical_condition(s)>

*\* In EXCEL – similar to the 'Filter' function*
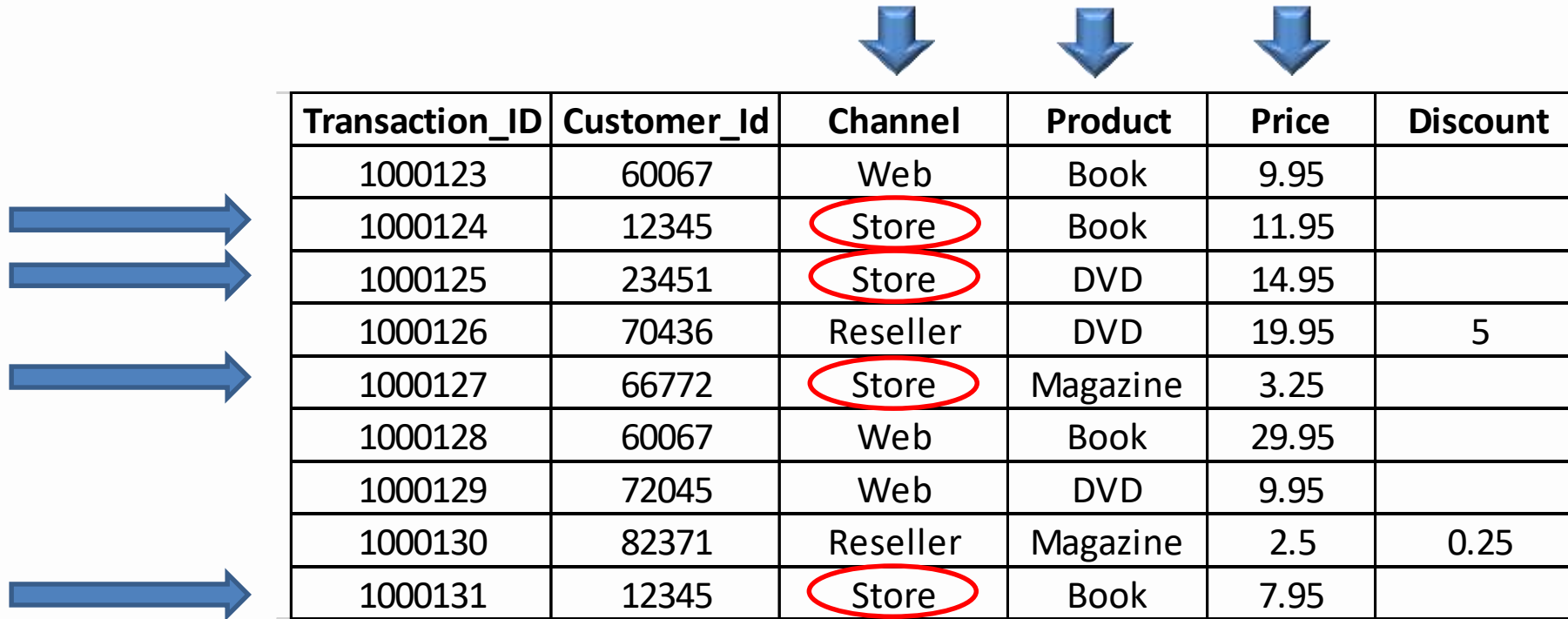
| Transaction_ID | Customer_Id | Channel | Product | Price | Discount |
|----------------|-------------|---------|---------|-------|----------|
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| 1000130 | 82371 | Reseller | Magazine | 2.5 | 0.25 |
| 1000131 | 12345 | Store | Book | 7.95 | |

# SQL – The WHERE Clause

```sql
SELECT *
FROM TRANSACTIONS
WHERE CHANNEL = 'STORE'
```

| Transaction_ID | Customer_Id | Channel | Product | Price | Discount |
|---|---|---|---|---|---|
| 1000124 | 12345 | Store | Book | 11.95 | |
| 1000125 | 23451 | Store | DVD | 14.95 | |
| 1000127 | 66772 | Store | Magazine | 3.25 | |
| 1000131 | 12345 | Store | Book | 7.95 | |

# SQL – The WHERE Clause

| Transaction_ID | Customer_Id | Channel | Product | Price | Discount |
|---|---|---|---|---|---|
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| 1000129 | 72045 | Web | DVD | 9.95 | |
| 1000130 | 82371 | Reseller | Magazine | 2.5 | 0.25 |
| 1000131 | 12345 | Store | Book | 7.95 | |

```
SELECT CHANNEL, PRODUCT, PRICE
FROM TRANSACTIONS
WHERE CHANNEL = 'STORE'
```

| Channel | Product | Price |
|---|---|---|
| Store | Book | 11.95 |
| Store | DVD | 14.95 |
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