Let’s go **completely through SQL data types**, categorized neatly, with examples so you can use them correctly.

**SQL Data Types**

Data types define the **type of data a column can store** in a table. SQL data types vary slightly between **MySQL, SQL Server, Oracle, PostgreSQL**, but the core concepts are the same.

**1. Numeric Data Types**

Used to store numbers (integers, decimals, floats).

| **Data Type** | **Description** | **Example** |
| --- | --- | --- |
| INT / INTEGER | Whole numbers (positive/negative) | 10, -5 |
| SMALLINT | Smaller range integers | -32768 to 32767 |
| BIGINT | Large integers | 9223372036854775807 |
| DECIMAL(p,s) / NUMERIC(p,s) | Fixed-point numbers, p=precision, s=scale | DECIMAL(5,2) → 123.45 |
| FLOAT / REAL | Approximate floating-point numbers | 3.14159 |
| DOUBLE | Larger precision floating-point | 3.1415926535 |

**Example:**

CREATE TABLE Products (

ProductID INT,

Price DECIMAL(8,2),

Weight FLOAT

);

**2. Character/String Data Types**

Used to store text.

| **Data Type** | **Description** | **Example** |
| --- | --- | --- |
| CHAR(n) | Fixed-length string, pads with spaces | 'ABC ' if CHAR(5) |
| VARCHAR(n) | Variable-length string | 'Hello' |
| TEXT | Large text (MySQL/SQL Server) | Long paragraphs |
| NCHAR(n) | Fixed-length Unicode | 'नमस्ते' |
| NVARCHAR(n) | Variable-length Unicode | 'Mayuri' |
| CLOB | Character Large Object (Oracle) | Large text |

**Example:**

CREATE TABLE Students (

Name VARCHAR(50),

Address TEXT

);

**3. Date and Time Data Types**

Used to store dates, times, or both.

| **Data Type** | **Description** | **Example** |
| --- | --- | --- |
| DATE | Stores date only | '2025-10-16' |
| TIME | Stores time only | '14:30:00' |
| DATETIME | Stores date + time | '2025-10-16 14:30:00' |
| TIMESTAMP | Automatic date/time tracking | '2025-10-16 14:30:00' |
| YEAR | Stores year | '2025' |

**Example:**

CREATE TABLE Events (

EventName VARCHAR(50),

EventDate DATE,

StartTime TIME

);

**4. Boolean Data Type**

* Represents **TRUE or FALSE**.
* In MySQL: BOOLEAN (alias for TINYINT(1)), in PostgreSQL: BOOLEAN.

**Example:**

CREATE TABLE Tasks (

TaskName VARCHAR(50),

IsCompleted BOOLEAN

);

**5. Binary Data Types**

Used to store **binary data** like images or files.

| **Data Type** | **Description** |
| --- | --- |
| BLOB | Binary Large Object (MySQL) |
| VARBINARY(n) | Variable-length binary data |
| IMAGE | Image data (SQL Server) |

**Example:**

CREATE TABLE Photos (

PhotoID INT,

PhotoData BLOB

);

**6. Misc / Special Data Types**

* ENUM → A list of predefined values (MySQL)

CREATE TABLE Employee (

Name VARCHAR(50),

Gender ENUM('M','F')

);

* SET → Multiple predefined values (MySQL)
* JSON → Stores JSON format (MySQL, PostgreSQL)
* UUID → Universally Unique Identifier (PostgreSQL, MySQL)

**7. Quick Reference Table**

| **Category** | **Data Types Example** | **Usage** |
| --- | --- | --- |
| Numeric | INT, SMALLINT, BIGINT, DECIMAL, FLOAT | Numbers, money, calculations |
| Character | CHAR, VARCHAR, TEXT, NCHAR, NVARCHAR | Names, addresses, descriptions |
| Date & Time | DATE, TIME, DATETIME, TIMESTAMP, YEAR | Birthdate, timestamps, schedules |
| Boolean | BOOLEAN / TINYINT(1) | TRUE / FALSE flags |
| Binary | BLOB, VARBINARY, IMAGE | Files, images, encrypted data |
| Special | ENUM, SET, JSON, UUID | Predefined values, JSON, unique IDs |