Database Data Types and Constraints

This document provides an overview of common data types, NULL/NOT NULL constraints, and identity columns in databases.

Data Types

In a database, data types define the type of data that a column can hold. Common data types include:

1. Integer Types

- INT: A standard integer. Range and storage size depend on the database system.
- SMALLINT, BIGINT: Variations of integers with different range limits.

2. Floating Point Types

- FLOAT, DOUBLE: Represent numbers with fractional parts.
- DECIMAL, NUMERIC: Precise fixed-point numbers. Useful for monetary data.

3. String Types

- CHAR(n): Fixed-length string.
- VARCHAR(n): Variable-length string.
- TEXT: Large variable-length string.

4. Date and Time Types

- DATE: Stores dates.
- TIME: Stores time of day.
- TIMESTAMP: Stores date and time.

5. Binary Types

- BINARY: Fixed-length binary data.
- VARBINARY: Variable-length binary data.

6. Boolean Type

- BOOLEAN: Stores true/false values.

Null and Not Null

- NULL: Indicates that a column can store a missing or undefined value. It means no value is assigned to the column.
- NOT NULL: Ensures that a column must have a value. It cannot be left empty.

Example:

```
CREATE TABLE employees (
  id INT NOT NULL,
  name VARCHAR(50) NOT NULL,
```

```
  birthdate DATE,
  salary DECIMAL(10, 2)
);
```

Identity Columns

Identity columns are used to automatically generate unique values for a column, typically used for primary keys. They auto-increment each time a new record is inserted.

Example in SQL Server:

```
CREATE TABLE employees (
  id INT IDENTITY(1,1) PRIMARY KEY,
  name VARCHAR(50) NOT NULL,
  birthdate DATE,
  salary DECIMAL(10, 2)
);
```

Summary:

- Data Types specify the kind of data a column can store (e.g., INT, VARCHAR, DATE).
- NULL/NOT NULL constraints define whether a column can have empty values.
- Identity Columns auto-generate unique values for each new record, useful for primary keys.