Fair Use Notice:

The material used in this presentation i.e., pictures/graphs/text, etc. is solely intended for educational/teaching purpose, offered free of cost to the students for use under special circumstances of Online Education due to COVID-19 Lockdown situation and may include copyrighted material - the use of which may not have been specifically authorised by Copyright Owners. It's application constitutes Fair Use of any such copyrighted material as provided in globally accepted law of many countries. The contents of presentations are intended only for the attendees of the class being conducted by the presenter.

DATABASE SYSTEMS (SW215)

STRUCTURED QUERY LANGUAGE

By : HIRA NOMAN

QUERY LANGUAGES

- Are computer languages used to make queries into db & Information systems.
- They are classified based on db query languages or information retrieval query Languages.
- Db query languages attempt to give factual answers to factual questions, while information retrieval query languages attempt to find documents containing information that is relevant to an area of inquiry.

Example:

- .QL
- Contextual Query Language(CQL) **(Information retrieval query language)**
- QUEL
- SQL(Structured Query Languages) **(db query language)**

STRUCTURED QUERY LANGUAGE

- Developed by IBM originally called Sequel.
- It is a nonprocedural language, i.e. You merely must command what is to be done ; you don’t have to worry about how it is to be done.
- SQL lets you access and manipulate databases.
- SQL became a standard of the American National Standards Institute (ANSI) in 1986, and of the International Organization for Standardization (ISO) in 1987.
- Not case sensitive .

WHAT CAN SQL DO?

- SQL can execute queries against a database.
- SQL can retrieve data from a database.
- SQL can insert records in a database.
- SQL can update records in a database.
- SQL can delete records from a database.
- SQL can create new databases.
- SQL can create new Db Objects in a database.
- SQL can create stored procedures in a database.
- SQL can set permissions on tables, procedures, and views.

DATABASE OBJECTS

1. Table
2. Index
3. View
4. Sequence
5. Synonym

SQL DATATYPES

The data type is a guideline for SQL to understand what type of data is expected inside of each column, and it also identifies how SQL will interact with the stored data.

1. Numeric

a) Number (L,D)

L = Storage Length **D = Number of Decimal Places**

Fixed and Floating Point in the range 10^{-130} to 10^{126} with up to 38 decimal Places.

Example:

- **Number (7,2)** Number will be stored with two decimal places & may be up to 6 digits long.
  i.e. (12.32, -134.99, 4123.32)
- **Number(7)** Number up to 6 digits long.
  i.e. (0.023 ,123456)
- **Number** System default specification.

b) Integer

Can be abbreviated as INT. Integers are whole counting numbers and can't contain decimal. Up to 11 digits are allowed.

Example:

(12, 36452)

c) Decimal(L,D)

Like number specification but the storage length is the minimum specification i.e., greater lengths are acceptable but smaller ones are not.

2. Character

a) Char(L)

L = length in characters

A FIXED length string (can contain letters, numbers, and special characters). The column length can be from 0 to 255. Default is 1.

If you store strings that are not as long as the CHAR parameters values ,the remaining spaces are filled with blanks.
Default size is 1 Maximum 2000 characters.

Example:

- **Char(6)** Smith**b**
- **Char(8)** Smith**bbb**

b) VarChar2(L)

L = length in characters

A VARIABLE length string (can contain letters, numbers, and special characters). The *size* parameter specifies the maximum column length in characters - can be from 0 to 65535.
In variable length character data, no blanks are stored.

Example:

- **Varchar2(10)** up to 10-character Smith

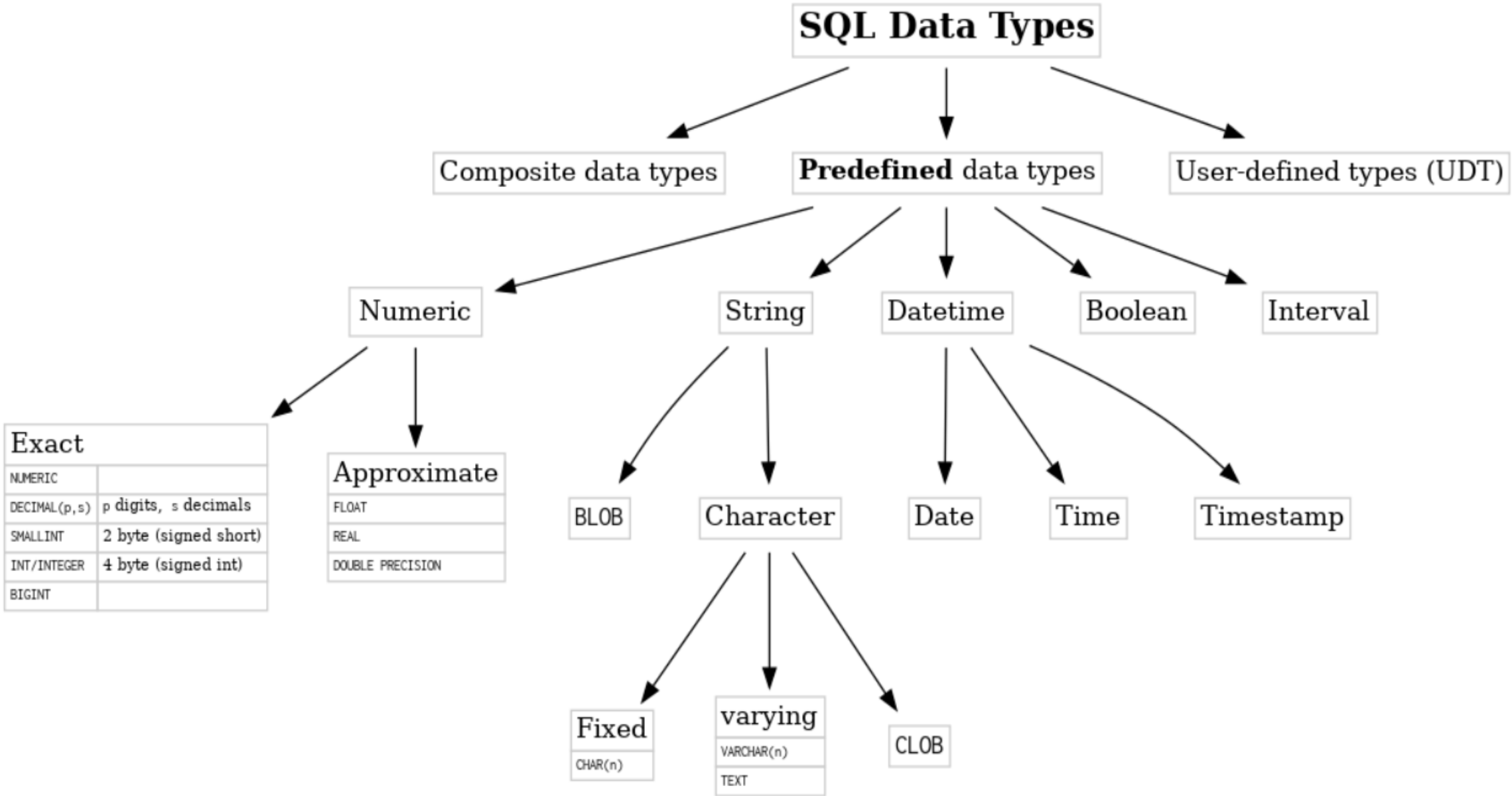
No default size, Maximum 4000 characters.

3. Date

Stores date in Julian date format .Date specification automatically reserves 10 spaces per entry.

Example:

	Year		Month		Days	
	4 digits		2 digits		2 digits	
Format:	**YYYY**	**-**	**MM**	**-**	**DD**	
	2020	-	12	-	11	10 spaces (-,-)


SQL Data Types
Composite data types
Predefined data types
User-defined types (UDT)
Numeric
String
Datetime
Boolean
Interval
Exact
NUMERIC
DECIMAL(p,s)
p digits, s decimals
SMALLINT
2 byte (signed short)
INT/INTEGER
4 byte (signed int)
BIGINT
Approximate
FLOAT
REAL
DOUBLE PRECISION
BLOB
Character
Date
Time
Timestamp
Fixed
CHAR(n)
varying
VARCHAR(n)
TEXT
CLOB

CATEGORIES OF SQL STATEMENTS

1. **Data Definition Languages (DDL).**
2. **Data Query Languages (DQL).**
3. **Data Manipulation Languages (DML).**
4. **Data Control Languages (DCL).**
5. **Transaction Control Languages (TCL).**