**Structure Query Language:**

* Structure query language is commonly pronounced as “SEQUEL”

(Structure English query language).

* Dr E.F Codd published the paper on relational database model in June 1970 at IBM Corporation, Inc.
* SEQUEL later becomes SQL.
* It allows the user to communicate as the server.
* It is easy to learn and use.
* It is functionally complete, by allowing the user to define, retrieve and manipulate the data.

**Components of SQL:**

* Oracle SQL complies with industry accepted standards.
* The SQL Contains 5 sub language.

1. **Data Retrieval /Query Language (DRL/DQL)**

* Select

(It is used to retrieve the information from the database objects for read only purpose.)

1. **Data Manipulation Language (DML)**

* Insert (new content)
* Update (modify)
* Delete (remove)
* Insert all
* Merge

(it is used to manipulate the data in the database objects)

1. **Data definition language (DDL)**

* Create
* Alter
* Drop
* Truncate
* Rename

(Used to define database objects i.e. creation, modification, removing)

1. **Data control language (DCL)**

* Grant (give)
* Revoke (cancel)

(It is used to share the information between users)

1. **Transactional control language (TCL)**

* Commit
* Rollback
* Savepoint

(It is used to save or cancel DML operations)

**SQL \* PLUS Buffer:**

* SQL \* PLUS is Oracle’s developed environment tool.
* We can use directly SQL & PL/SQL statements in this environment tool.
* All commands of SQL are typed at the SQL prompt.
* Only one SQL Statement is managed in the SQL Buffer.
* The current SQL Statement replaces the previous SQL statement in the buffer.
* SQL Statement can be divided into different line within the SQL buffer.
* Only one line i.e. the current line can be active at a time in the SQL buffer.
* At SQL prompt, editing is possible only in the current SQL Buffer line.
* Every statement of SQL should be terminated using (;).
* To run the previous or current SQL Statement in the buffer type ‘/’ at SQL prompt.
* To open the SQL Editor type ed at SQL prompt.
* It provides…
* SQL Commands
* PL/SQL Block
* It has own commands to set environment as requirement.
* To generate report.
* To save SQL command as File(.sql)
* To save output as file(.lst)

**Creating and Managing Tables:**

**Database Objects:**

* An Oracle database can contain multiple data structures.
* The different Database objects in Oracle are:

**TABLE:** Used to store data, Basic Unit

**VIEW:** Logically represent subsets of data from one or more tables.

**SEQUENCE:** Used to Generate Primary Key values.

**INDEX:** It is used to improve the performance of some queries.

**SYNONYM:** Used to give alternate names to objects.

**Table in Oracle:**

* Table can be created at any time, even when the users are using the Database.
* Size of the table need not be specified.

**To create table:**

l) Table Name 2) Column Name 3) Data Type

**Table Restriction:**

* The user should have permission or CREATE TABLE command, and storage area.
* Table name must be unique in schema
* The Table name should begin with a letter and can be 1-30 characters long.
* Maximum 1000 columns (8.0), 256 in 7.x
* Names can contain:

\*\*A -- Z \*\*a -- z \*\*0—9 \*\*\_, $, #

* Names cannot be duplicated for another object in the same ORACLE Server.
* Name cannot be oracle server reserved words.
* Names are not case sensitive.

**COLUMN NAME:**

* The column name should begin with a letter and can be 1-30 characters long.
* Column name is Unique in a table.
* Column name can be renamed.
* Maximum columns in table are 1000.

**Data Types in Oracle:**

* Each value in ORACLE is manipulated by a data type.
* The values of one data type are different from another data type
* The data type defines the domain of values that each column can contain.
* The Built-in-data types of ORACLE are Categorized as
* CHARACTER Data Types
* NUMBER Data Types
* LONG and RAW Data Types
* DATETIME Data Types
* ROWID Data Types

**Character Data Types:**

* They store character data which can alphanumeric data.
* The Information can be
* Words
* Database Character set
* National Character set
* They are less restrictive than other data types and have very few  
  properties.
* The data is stored in strings with byte values
* The different character data types are:

CHAR NCHAR

VARCHAR2 NVARCHAR2

**CHAR Data Type:**

* + - It specifies fixed length character string.
    - The size should be specified.
    - If the data is less than the original size, blank pads are applied.
    - The default length is 1 Byte and the Maximum is 2000 Bytes.

**NCHAR Data Type:**

* It is first defined in ORACLE 9i, and contains Unicode data only.
* The column's maximum length is determined by the National Character set definition.
* The Maximum size allowed is 2000 Bytes and size has to be specified.
* If the data short than the actual size then the blank pads are applied.

**Varchar2 Data Type:**

* A data type used for storing text data.
* The Minimum size is 1 Byte and the Maximum size is 4000 Bytes
* It occupies only that space for which the data is supplied.
* Any text character (including special characters, number, dashes, and so on) can be stored.

**Nvarchar2 Data Type:**

* It is first defined in ORACLE 9i, and contains Unicode data only.
* The Minimum size is 1 Byte and the Maximum size is 4000 Bytes.

**Number Data Type:**

* Number (Precision, Scale)
* Number data type stores the numeric data, the precision is the total no  
  of digits required and scale stands for the rounding of decimal place.
* Range of precision is from 1 to 38.

**Integer Data Type:**

* Integer data type will be converted as Number Data type with the maxim size 38 digit as precision.

**LONG:**

* This data type is used to store characters or numbers.
* Maximum size limit is 2 GB.
* Only one Long column is valid per table.

**Date** & **Time Data Type:**

* It is used to store dates and time information.
* The information revealed by date is:

\*Century \*Year \*Month

**\*Date \*Hour \*Minute \*Second**

* The default date format in ORACLE is DD-MON-YY.
* The default time accepted by ORACLE date is 12:00:00 AM (Midnight).
* The default date accepts by ORACLE data is the First day of the Current month.
* The Date range provide by Oracle is

JANUARY 1, 4712 BC to DECEMBER 31, 9999 AD.

**Timestamp date type:**

* It is an extension of the Date data type.
* It stores

\*DAY \*MONTH \*YEAR \*HOUR

\*MINUTE \*SECOND

**Syntax: TIMESTAMP (Fractional-Seconds-Precision)**

* Fractional-seconds-precision optional specifies the number of digits in the fractional part of the second date time field.
* It can be a number in the range of 0-9, with default as 6.

**RAW:**

* It stores binary information like Photos, Signature, Thumb impressions etc.
* Maximum length is 2000 Bytes.
* The Oracle converts the RAW and LONG RAW data into Hexadecimal form.
* Each Hexadecimal character represents four bites of RAW data.

**LONG RAW:**

* It stores the binary data similar to RAW but can store more bytes than RAW.
* Maximum length is 2GB.
* No size is required.

**Large Object (LOB) Data Types:**

* The built in LOB data Types are
* \*BLOB \*CLOB \*NCLOB
* These data types are stored internally
* The Bfile is an LOB which is stored externally
* The LOB data type can store large and untrusted data like Text, Image , Video and spatial data.
* The maximum size is upto 4GB
* LOB Coloumns contain LOB Locators,Which can refer to out-of-line to or in-Line LOB Values
* LOB’s selection actually return the LOB’s Locator.

**BFILE Data Type:**

• It enables access to binary file LOB's which are stored in the systems  
outside ORACLE.

* A BFILE column or the attributes stores the BFILE locator.
* The BFILE locator maintains the directory alias and the filename.
* The Binary File LOB's do not participate in transaction and are not recoverable.
* The maximum size is 4 GB.

**BLOB Data Type:**

* It stored unstructured Binary Large Objects.
* They are Bit streams with no character set semantics.
* They are provide with full transactional support.

**CLOB Data Type:**

* It Dynamic data type.
* They are provided with full transactional support.
* The maximum size is 4 GB.

**NCLOB Data Type:**

• It stores Unicode data using the National Character set.  
**ROWID Data Type:**

* Each row in the database has as address.
* The rows address can be queried using the pseudo column ROWID.
* ROWID's efficient support partitioned table and Indexes.