Digital Business Solutions

- SQL Syllabus

Industry Based Curriculum

SQL

- What is SQL
  - SQL developed in 1970s
  - Structured Query Language (ANSI) in 1986.
- What is DBMS
- What is a Database
- What is a RDBMS
- Types of RDBMS:
    - OLAP RDBMS – Historical Data
    - OLTP RDBMS – Real time Transactional Data

USES OF SQL:

- Creating, modifying and deleting databases objects as well as data .
- Retrieving data, updating data from database/backend
- Grouping/aggregating data.
- Joining data from multiple tables.
- Performance tuning/improvement.
- Monitoring database.- identifaying blocking database sessions.

Database Objects

- Users,tables,views,indexes,sequences,clusters
- Synonyms,procedures,functions,triggers,packages,cursors.

- Database Object :
  - We are creating DB object structure to fulfill particular task in database this is called as DB object.
  - Tables,Users, views , indexes - SQL
  - Synonyms,procedures,functions,triggers,packages,cursors - PLSQL

Data Types

- Types of data
- Allocating memory for values in a table
- Char/string data
  - Char : (10)
    - 1 char
    - Size 2000 bytes/characters
    - Fixed length data
      - PAN
      - Mobile
- Varchar – Reserved by oracle inc for future R&D
  - Size 2000 bytes/characters.
- Varchar2(4000)
  - Variable length data
  - 4000 bytes of character
- Long (size)
  - Max size 2 GB
  - Declare only one long column in single table

- Nchar (size)
- Nvarchar2(size)
- Multilingual language support
  - Hindi,English,tamil,marathi
- number:
  - 0-9
- Number (precision):
  - Number(38)
  - 9999999999
- Number (Precision, Scale):
  - Number(4,2) 4-2 =2
  - Value = 99.20
  - Number(8,3) 8-3=5
  - 12345.252
  - It will support upto 38 digits in oracle
- Date:
  - dd-mm-yy
  - Ex: 10-10-24
  - Predefined date format supported by oracle:
    - dd-mon-yy
    - Ex-01-JAN-23
    - 01/JAN/24

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- Binary data:
  - Unstructured data
    - Images,digital sign, logos, audio and video files
  - Raw (Size)
    - 2000 bytes
  - Long raw(size)
    - Size supported 2 GB
- LOB(Large Objects)
  - If exceeding 2 GB value
  - Size supported 4 GB
    - Clob
    - Blob
    - Nclob

SQL Commands:

- Table Aliases:
  - select * from employee e;

- DDL: Data Definition Language commands
  - Create
  - Alter
    - Add
    - Drop
    - Modify
    - Rename
    - Ex: alter table student add (product varcha2(100));
  - Drop
  - Truncate
  - Comment
    - Table Comment
    - Column Comment

- DML: Data manipulation language commands
  - Insert
    - Implicit insertion
    - Explicit insertion
  - Update
  - Delete
  - Merge
  - Select
- TCL: Transaction Control Language commands
  - Commit
  - Rollback
  - Savepoint

- DRL/DQL/DML:
  - Select
- DCL: Data control Language Commands
  - Grant
  - Revoke

Restrict and Sort Data:

- Where clause
- Order by
- Arithmetic Operators
- Comparison Operators/Relational Operators
- Logical Operators
- DESC keyword
- DISTINCT – To avoid duplicate values
- Set Operators
- Special Operators: REGEX- Advanced pattern matching techniques
- How to create database link

CONSTRAINTS:

- NOT NULL, UNIQUE, PRIMARY KEY, FOREIGN KEY, CHECK, default
- Column Level Constraint, Table Level Constraint – Naming constraints and usage
- Composite Primary key
- Adding a Constraint, Dropping a Constraint
- Disabling Constraints, Enabling Constraints
- Validating Constraints

JOINS

- Types Of Join
  - Logical Joins
  - Physical Joins
    - Equi Join/Normal Join/
    - Cross Join
    - Natural Join
    - Self join
    - Outer join:
      - Left outer join
      - Right outer join
      - Full outer join

Functions:

- Single Row Functions
  - Character Functions
  - Number Functions
  - Date Functions
  - Conversion Functions
  - General Functions
  - CASE Expression, Decode

Analytical Functions

- LAG, LEAD, RANK, DENSE_RANK, ROWNUMBER

- Psudo column : Rownum, Rowid, - Elimination duplicate data
- Connect by rownum , Connect by Level – Generating random numbers, random dates.
- Rank-
  - Assigning the rank/numbering
  - Marks- 100 200 200 300
  - Rank – 1 2 2 4

- Multi Row Functions:
  - Group Functions Rules, sum,min,max,count,avg
  - Creating groups of data: GROUP BY Clause
  - Filtering group results: The having clause

Sub – Queries:

- Single Row Subqueries
  - Operators : = > >= < <= <>
- Multi Row Subqueries
  - Operators : IN
- Correlated subquery:
  - Which is repeatedly executed.
  - Main query will be referenced in the inner query
  - Then this will become a correlated subquery.

- DATA LOADER
  - SQLLDR – Loading CSV file / Flat file into ORACLE table
- Backup
  - Export/Import Schema
- Migration
  - Migration from lower version to higher version
  - Oracle Golden gate replication
  - RMAN backup/restore

Oracle Database Architecture

Oracle Database Server- Hosted on unix/windows

- Oracle Instance
  - System Global Area (SGA) – Memory – part of physical RAM – any read or write operation will happen inside SGA
  - Background Process
  - Program global area(PGA)- To execute any process inside database (Server process)
- Physical Files
  - Data Files all data stored inside this files
  - Control Files - all information about database, data file location name, size
  - Redolog Files – committed and uncommitted changes stored in this files
    - All transaction will be stored in redolog files
- Password file
- Archivelog files
- Alertlog files

Schema/Database Objects

- PLSQL-
- Views
- Indexes
- Sequences
- Types
- Procedure
- Function
- Packages