Topics – Fundamentals of PL/SQL, Integration with PROIV SuperLayer and use within Glovia

1. Creating a Database Alias

2. Introduction to SQL

Relational Database Concept
Definition of Relational Database
Data Models
    Entity Relationship Models
Relational Database Terminology
Relating or Joining Multiple Tables
Relational Database Properties
What is SQL?

3. SQL Basics

Basic Select Statement
Writing SQL Statements
Executing SQL Statement
Selecting ALL Columns
Selecting Specific Columns
Specify the columns in the order you want to see them
Column Headings
Arithmetic Expressions
Using Parenthesis
Null Values
Defining a Column Alias
Concatenation Operator (||)
Literal Character Strings
Duplicate Rows

4. Introduction to SQL*Plus

Logging into SQL*Plus
Displaying Table Structure
Displaying Procedure Structure
Displaying Function Structure
SQL*Plus Editing Commands
SQL*Plus File Commands

5. SQL:Filtering and Sorting Data

Filtering and Sorting Data

Character Strings and Date
Comparison Operators
- The BETWEEN Operator
- The IN Operator
- The LIKE Operator
- The NULL Operator

Logical Operators
- The AND Operator
- The OR Operator
- The NOT Operator

ORDER BY Clause
- Sorting in Descending Order
- Sorting by Multiple Columns

ESCAPE Clause

6. SQL: Single Row Functions

Character Functions
- The ASCII Function
- The CHR Function
- The CONCAT Function
- The INITCAP Function
- The INSTR Function
- The LENGTH Function
- The LOWER Function
- The LPAD Function
- The LTRIM Function
- The REPLACE Function
- The RPAD Function
- The RTRIM Function
- The SOUNDEX Function
- The SUBSTR Function
- The TRANSLATE Function
- The UPPER Function

Date Functions
- The ADD_MONTHS Function
- The LAST_DAY Function
- The MONTHS_BETWEEN Function
- The NEXT_DAY Function
- Masks for DATE Format
- Masks fir TIME Format
- Other Masks
- The ROUND Function
- The SYSDATE Function
- The TRUNC Function

Numeric Functions
- The ABS Function
- The CEIL Function
- The FLOOR Function
- The MOD Function
- The ROUND Function
- The TRUNC Function

Conversion Functions

- The TO_CHAR Function
- The TO_DATE Function
- The TO_NUMBER Function

General Functions
- The DECODE Function
- The GREATEST Function
- The LEAST Function
- The NVL Function
- The UID Function
- The USER Function

7. SQL: Joining Multiple Tables

Cartesian Product
Types of Joins
- Equijoin
- Retrieving Records with Equijoin
- Non-Equijoins
- Outer Joins
- Self Joins

Aggregating Data Using Group Functions
Using Group Functions
- The GROUP BY clause
- The HAVING clause

8. SQL: Subqueries

When to use Subqueries
Guidelines for using Subqueries
Single Row Subqueries
The HAVING clause with Subqueries
The EXISTS clause

9. SQL: Data Manipulation Language

The INSERT Statement
The UPDATE Statement
The DELETE Statement
Database Transactions
COMMIT, SAVEPOINT and ROLLBACK

10. Report Writing with SQL*Plus

Substitution Variables
Using SET VERIFY Command
Specifying Column names and Expressions at runtime
Using the && Substitution Variable
The ACCEPT Command
DEFINE and UNDEFINE Command
SET Command Variables
SQL*Plus Format Commands
The COLUMN Command Options
Using the COLUMN Command
Displaying or Clearing settings

COLUMN Format
The BREAK Command
Using TTITLE and BTITLE Commands

11. Creating and Managing Tables

Database Objects
Table Naming Conventions
CREATE TABLE Statement
Creating tables using glovia.com
glovia.com Create Table Script
The DEFAULT Option in CREATE TABLE
Table information in the Oracle Data Dictionary
COLUMN Datatypes
Using a Subquery to Create a Table and Insert Rows
ALTER TABLE Statement
    Adding a Column
    Modifying a Column
TRUNCATE TABLE Statement
DROP TABLE Statement
Renaming Objects

12. Constraints

Types of Constraints
    Constraint Levels
Defining Constraints
NOT NULL Constraint
UNIQUE Key Constraint
PRIMARY KEY Constraint
FOREIGN KEY Constraint
CHECK Constraint
Adding a Constraint
Dropping a Constraint
Disabling a Constraint
Enabling a Constraint
Viewing Constarints and Associated Columns

13. Views

Characteristics of a View
Types of Views
Creating a View
Retrieving Data from a View
Removing a View
Using Views in glovia.com

14. Indexes

What is an Index
Creating an Index
Removing an Index
Creating Indexes using glovia.com
glovia.com Index Create scrip

15. Sequences

What is a Sequence?
Benefits of using a Sequence
Creating a Sequence
NEXTVAL and CURRVAL pseudocolumns
    Rules for using NEXTVAL and CURRVAL
Using a Sequence
Modifying a Sequence
Removing a Sequence

16. PROIV: SQL Environment

Features
Modes of Operation
Transparency Mode
    Primary Files
    Paging LS
Full Function Mode
    Type 1
    Type 2
NULL Data

17. PROIV: SQL Transaction Processing

Automatic Commit
    Screen Functions
    Update and Report Functions
Automatic Rollback
Control of Commit and Rollback from Logic

18. Introduction to PL/SQL

What is PL/SQL?
Benefits of PL/SQL
    Improved Performance
    SQL datatypes can also be used in PL/SQL
    Application Portability
    Improved Execution Authority and Transaction Integrity
    Integration with SQL
    Expanded set of datatypes for variables and constants
    Programmer defined Records and Tables
    Built-in functions
    Built-in packages
    Control structures
    Cursor-based access to the database
    Error handling
    Modular construction
    Stored procedures, functions and packages
    Stored functions in SQL
    Support for DDL and dynamic SQL
    PL/SQL wrapper
    Job scheduling with DBMS_JOB

- File I/O with UTL_FILE package

19. PL/SQL Language Fundamentals

- PL/SQL Character Set
- Symbols in PL/SQL
- Identifiers
- Literals
- Semicolon Delimiter
- Comments
- Block Structure
  - Identifiers
  - Procedural Language Control Structures
  - Error Handling
- Block Types
  - Anonymous Blocks
  - Subprograms
- Scope of a Block
- Nested Blocks
- Executing Statements and PL/SQL Blocks from SQL*Plus

20. Effective Coding Style

- Using Identation
- Upper and Lower Case Combination
- Formatting
  - Single Statements
  - Multiline Statements
  - Declarations
  - SQL Statements
  - Control Structures
  - Loops
  - Exception Handlers
- Using Comments

21. Variables and Program data

- Program Constructs
- Use of Variables
- Handling variables in PL/SQL
- Types of Variables
- Using SQL*Plus Variables Within PL/SQL Blocks
- Declaring PL/SQL variables
- Naming Rules
- Assigning Values to variables
- Variable Initialization and keywords
- Scalar Datatypes
- The %TYPE attribute
- Declaring variables with the %TYPE attribute
- Declaring Boolean Variables
- Composite datatypes
- LOB datatype variable
- Bind variables
- Referencing non-PL/SQL variables

DBMS_OUTPUT.PUT_LINE

22. Writing Executable Statements

PL/SQL Block Syntax and guidelines
SQL functions in PL/SQL
Datatype conversion
Nested blocks and variable scope
Operators in PL/SQL
Programming guidelines
Code naming conventions

23. Database Interaction

Transaction Management
SQL statements in PL/SQL
Retrieving data in PL/SQL
Manipulating data using PL/SQL
Inserting data
Updating data
Deleting data
Naming conventions
COMMIT and ROLLBACK statements
SQL cursor
SQL cursor attributes

24. Control Structures and Loops

Controlling PL/SQL Flow of Execution
IF Statement
Simple IF statement
IF-THEN-ELSE statement
IF-THEN-ELSIF statement
Building logical conditions
Boolean conditions
Iterative control: LOOP statements
Basic loop
FOR loop
WHILE loop
Nested loops and labels

25. Records and Tables in PL/SQL

Composite Datatypes
PL/SQL records
Creating a PL/SQL record
PL/SQL record structure
The %ROWTYPE attribute
Advantages of using %ROWTYPE
PL/SQL tables
Creating a PL/SQL table
PL/SQL table structure
Using PL/SQL table methods
PL/SQL table of records

26. Explicit Cursors

About cursors
Implicit and Explicit cursors
Explicit cursor functions
Controlling explicit cursors
Declaring the cursor
Opening the cursor
Fetching data from the cursor
Closing the cursor
Explicit cursor attributes
Controlling multiple fetches
The %ISOPEN attribute
The %NOTFOUND and %ROWCOUNT attribute
Cursors and records
Cursor FOR loop
Cursor FOR loop using Subqueries

27. Advanced Explicit Cursors

Cursors with parameters
The FOR UPDATE clause
The WHERE CURRENT OF clause

28. Handling Exceptions

What is an Exception?
How is it raised?
How do you handle it?
Exception Types
Trapping Exceptions
Trapping Exceptions Guidelines
Trapping Predefined Oracle Server Errors
Predefined Exception
Trapping Non-Predefined Oracle Server Errors
Trapping User Defined Exceptions
Functions for Trapping Exceptions
RAISE_APPLICATION_ERROR procedure