Date: 19/11/2024

Name: Srivartshan M

PL/SQL

- PL/SQL, short for "Procedural Language Extension for Structured Query Language," is widely used for querying and updating data in relational database management systems (RDBMS).
- It enhances the SQL language by introducing procedural constructs, addressing SQL's limitations. PL/SQL is both structured and readable, making it ideal for robust database operations.
- PL/SQL is a versatile language, combining SQL capabilities with procedural logic, making it suitable for building complex applications.
- It offers advanced features such as exception handling, cursors, loops, and modular programming, making it an essential tool for Oracle database development.

Anonymous Block

- An anonymous block is a PL/SQL block without a name. It is not stored in the Oracle database server and is intended for one-time use.
- PL/SQL anonymous blocks are particularly useful for testing purposes.

A block consists of three sections:

- Declaration Section
- Execution Section

- Exception-Handling Sec

Declaration Section:

- The Declaration section begins with the DECLARE keyword. Variables, constants, records, and cursors are defined here to temporarily store data.

Execution Section:

- The Execution section starts with the BEGIN keyword and ends with END. It is the most critical section where the program logic, including loops and conditions, is implemented.
- This section contains SQL statements and procedural code to perform various tasks.

Exception-Handling Section:

- The Exception-handling section starts with the EXCEPTION keyword and is executed when a run-time error occurs.

SQL Commands:

- It is used to interact with the database with some operation. It is also used to perform specific tasks, functions, and queries of data.

DDL – Data Definition Language

DQL – Data Query Language

DML – Data Manipulation Language

DCL – Data Control Language

TCL – Transaction Control Language

Data Definition Language:

- DDL is a set of SQL commands used to create, modify, and delete database structure but not data.
- It simply deals with descriptions of the database.
- It consists of the SQL commands that can be used to define the database.
- These commands are normally not used by a general user, they should be accessing the database through the application.

List of DDL commands:

Create – Create database or its objects (table, index, function, views)

Drop – Delete object from the database

Alter – Alter the structure of the database

Comment – Add comments to the data dictionary

Rename – Rename an object existing in the database.

Data Manipulation Language (DML):

- DML is a part of SQL that allows access to and manipulation of data in the database. DML statements are often used alongside Data Control Language (DCL) statements.
- These statements are used to retrieve, insert, update, and delete data in existing database tables.

- DML operations modify the contents of Oracle database tables by adding, changing, or deleting records.

Common DML Statements:

- INSERT: Adds new data to a table.
- UPDATE: Modifies existing data in a table.
- DELETE: Removes records from a table.
- LOCK: Controls concurrency by locking a table.
- CALL: Invokes a PL/SQL or Java program.
- EXPLAIN PLAN: Provides details on the access path used to retrieve data.

Primary Key and Foreign Key:

- A Primary Key uniquely identifies each record in a table. It must contain unique values, and it cannot contain Null Values.
- A table can have only one primary key, but it can consist of one or more columns (Composite primary key).

Properties of Primary Key:

- Uniqueness: The Primary cannot be duplicated among two different rows.
- Non-Nullable: A Primary key column cannot contain null values.
- Indexing: To enhance the speed of the query, the primary key index is set to be created as an identity.

Foreign Key:

- A foreign key is a column or set of columns in a table that establishes a relationship between two tables by referencing a primary key or unique key in another table.
- The table containing the foreign key is referred to as the child table, while the table with the primary key is known as the parent table or referenced table.
- Foreign keys ensure that the values in specific columns of the child table match values in the primary key fields of the parent table, maintaining data integrity.

Properties of Foreign Key:

- Establishes Relationships
- Referential Integrity
- Allows Null Values
- Cascade Options
- Multiple Foreign Keys

Create a Table and Insert a data:

```
CREATE DATABASE PRODUCT_DETAILS;

USE PRODUCT_DETAILS;

CREATE TABLE Products ( Product_id INT PRIMARY KEY, Product_name VARCHAR(50),

Product_qty INT NOT NULL, Product_price INT NOT NULL );

insert into Products(product_id,product_name,product_qty,product_price)
values(1,"mobile",50, 40000),

(2,"tab",20, 50000),
```

(3,"laptop",20,70000),

(4,"smartwatch",20,40000); select* from products;