Oracle Supplied Packages in Application Development:

DBMS_OUTPUT.PUT_LINE →

- PUT_LINE →
    1. Used to retrieve the values from buffer.
    2. It appends to an existing file.
    3. Overwrites
    4. Prints the output on console.
- SET SERVEROUTPUT ON → No of characters for printing (Min – 2000 and Max - UNLIMITED)
- DEFAULT → 20000 Characters
- DBMS_OUTPUT → Originally design to debug PL/SQL programmes
- DBMS_ALERT → TO raise alert for table if it more than specified
- DBMS_LOCK → To lock an Object (Table)
- DBMS_SESSION → To get User session information
- DBMS_SCHEDULER → for scheduling jobs (Mostly used for maintenance (Crone Jobs))
    - CRONTAB → has cronjobs → aka batch jobs

How DBMS_OUTPUT works?

- PUT and PUT_LINE → place text in buffer
- GET_LINE and GET_LINES → read the buffer
- Messages are not sent until the sending subprogram or trigger completes.

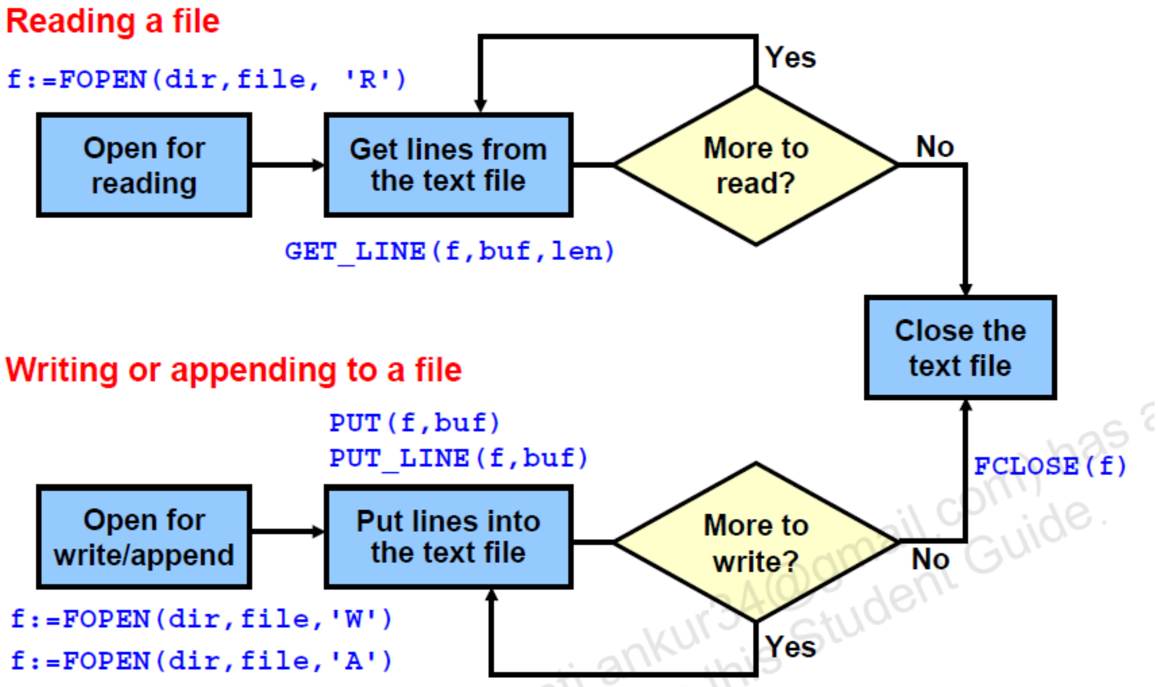
How UTL_FILE works?

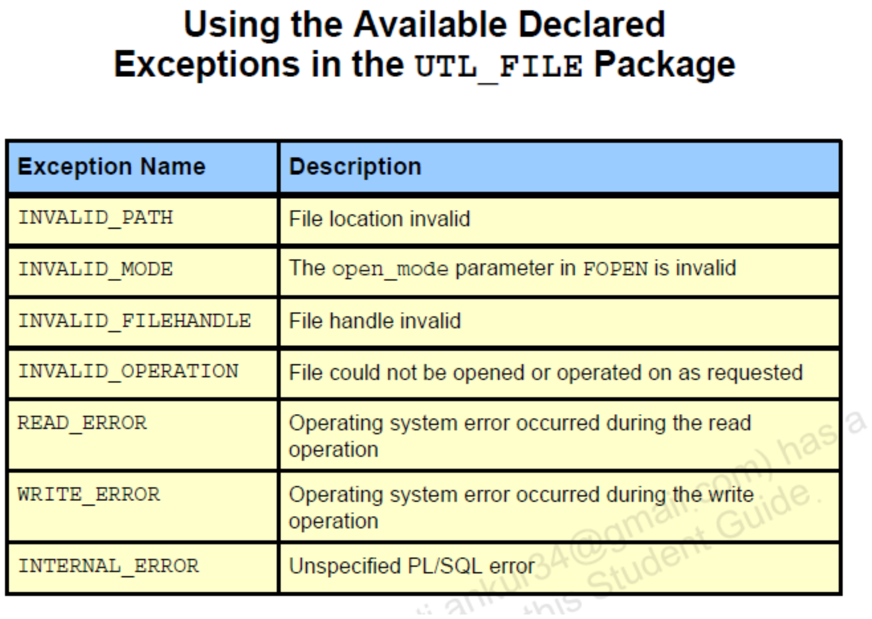
- Used to read and write the OS text files
- Provides a restricted version of OS stream file I/O for text file
- Can access files in OS directories defined by CREATE DIRECTORY
- RWA → Read, Write, Append

Some of the UTL_FILE Procedures and Functions

Subprogram	Description
ISOPEN function	Determines if a file handle refers to an open file
FOPEN function	Opens a file for input or output
FCLOSE function	Closes all open file handles
FCOPY procedure	Copies a contiguous portion of a file to a newly created file
FGETATTR procedure	Reads and returns the attributes of a disk file
GET_LINE procedure	Reads text from an open file
FREMOVE procedure	Deletes a disk file, if you have sufficient privileges
FRENAME procedure	Renames an existing file to a new name
PUT procedure	Writes a string to a file
PUT_LINE procedure	Writes a line to a file, and so appends an operating system-specific line terminator

File Processing Using the UTL_FILE Package: Overview



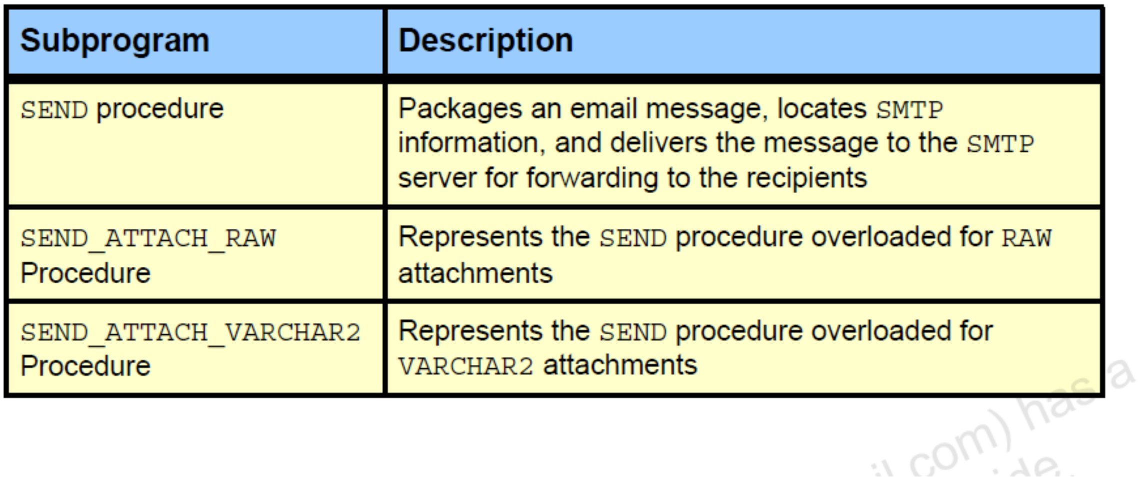


Using the Available Declared Exceptions in the UTL_FILE Package

Exception Name	Description
INVALID_PATH	File location invalid
INVALID_MODE	The open_mode parameter in FOPEN is invalid
INVALID_FILEHANDLE	File handle invalid
INVALID_OPERATION	File could not be opened or operated on as requested
READ_ERROR	Operating system error occurred during the read operation
WRITE_ERROR	Operating system error occurred during the write operation
INTERNAL_ERROR	Unspecified PL/SQL error

UTL_MAIL:

- A utility for managing email
- Requires SMTP_OUT_SERVER → initialization parameter for database
    - In init.ora file →
        - aka parameter file →
        - important initialization parameters are set in this file
        - If it removed or delete database will be in unmount state. Use this file to mount database.
- POP3 → SMTP (Simple Mail Transfer Protocol) → IMAP (Older to new)



Subprogram	Description
SEND procedure	Packages an email message, locates SMTP information, and delivers the message to the SMTP server for forwarding to the recipients
SEND_ATTACH_RAW Procedure	Represents the SEND procedure overloaded for RAW attachments
SEND_ATTACH_VARCHAR2 Procedure	Represents the SEND procedure overloaded for VARCHAR2 attachments

Execution Flow of SQL:

1. Parse: Syntax/Semantics
2. Bind: Binding the variables/values
3. Execute: Non-Query → Stopes here for Non-Query
4. Fetch: Queries →SELECT Query

Use of Dynamic SQL:

- To handle DDL Statements
- Is constructed as characters string, string variable and expression
- Used for DDL, DCL, Session control Statements and for Unknown items as
  - Text of SQL commands
  - Number and datatype of host variable
  - Reference to database object such as tables, columns, indexes, sequances and username
- Is executed with native dynamic SQL statement or the DBMS_SQL Package
  - Native Dynamic SQL: (NDS)
    - Provides an ability to execute SQL statement whose structure is unknown until execution time
    - For SELECT statement that returns multiple rows there are two choice:
      - EXECUTE IMMEDIATE with BULK COLLECT INTO clause
      - OPEN-FOR, FETCH and CLOSE statement

Using the EXECUTE IMMEDIATE Statement

Use the EXECUTE IMMEDIATE statement for NDS or PL/SQL anonymous blocks:

```
EXECUTE IMMEDIATE dynamic_string
  [INTO {define_variable
      [, define_variable] ... | record}]
  [USING [IN|OUT|IN OUT] bind_argument
      [, [IN|OUT|IN OUT] bind_argument] ... ];
```

- INTO is used for single-row queries and specifies the variables or records into which column values are retrieved.
- USING is used to hold all bind arguments. The default parameter mode is IN.

Available Methods for Using NDS

Method #	SQL Statement Type	NDS SQL Statements Used
Method 1	***Non-query without*** host variables	EXECUTE IMMEDIATE without the USING and INTO clauses
Method 2	***Non-query with*** known number of input host variables	EXECUTE IMMEDIATE with a USING clause
Method 3	***Query with known*** number of select-list items and input host variables	EXECUTE IMMEDIATE with the USING and INTO clauses
Method 4	***Query with unknown*** number of select-list items or input host variables	Use the DBMS_SQL package