Harshal Sawant
CWID: 20538827
ITMD 523-05
Lab 3

# LAB 3 SUBMITTAL

**Project One: Review on SQL introductory Concept**

Step 1: Review and solve the following exercises.

1. What condition do you use to display rows based on a range of values?
   ➔ To display rows based on a range of values, you typically use the `BETWEEN` condition.
   For example:
   **SELECT * FROM employees WHERE salary BETWEEN 10000 AND 20000;**

2. The character pattern-matching operation may involve which two symbols?
   ➔ The character pattern-matching operation in SQL often involves the following two symbols:
   `%` (percent sign): Represents zero or more characters.
   `_` (underscore): Represents a single character.

3. Group functions return one result per row. True / False.
   ➔ False. Group functions in SQL, such as `SUM`, `AVG`, `COUNT`, etc., return a single result for a group of rows, not one result per row.

4. Which function converts mixed case or upper character strings to lowercase?
   ➔ To convert mixed case or upper character strings to lowercase, you can use the `LOWER()` function.
   For example:
   **SELECT LOWER(salary) FROM employees;**

5. Which among the following are group functions? [Circle all that apply.]
   a. MAX b. ROUND c. STDDEV d. MOD e. CONCAT f. SUM g. MIN
   ➔ The group functions among the options are:
   a. MAX
   c. STDDEV
   f. SUM
   g. MIN

6. What is the default sorting order for rows?
   ➔ The default sorting order for rows in SQL is ascending (from the lowest value to the highest value) based on the specified column.

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7. You can sort by a column that is not in the SELECT list. True / False.
   ➔ True. You can sort by a column that is not in the SELECT list by including the column's name in the `ORDER BY` clause of your SQL query.

8. You cannot specify a column position as the sort expression. True / False.
   ➔ False. You can specify a column position as the sort expression in the `ORDER BY` clause of your SQL query.
   For example:
   **SELECT * FROM employees ORDER BY 2;**
   It sorts by second column.

9. Which statement do you use to modify existing rows in a table? Is a commit necessary?
   ➔ You use the `UPDATE` statement to modify existing rows in a table. A commit is necessary if you want to permanently save the changes made by the `UPDATE` statement to the database. You can issue a `COMMIT;` statement to commit the changes.

10. What happens if you do not specify the WHERE clause in a DELETE statement?
    ➔ If you do not specify the WHERE clause in a DELETE statement, it will delete all rows from the table, effectively truncating the entire table.

11. Consider a SELECT statement that consists of three query blocks: the outer query and two inner queries. If both the inner queries return single values, what do you call such a SQL statement?
    ➔ A SELECT statement with three query blocks, including the outer query and two inner queries, where both inner queries return single values, is often referred to as a "scalar subquery."

12. You can use subqueries only in the WHERE clause but not in the HAVING clause. True / False
    ➔ False. Subqueries can be used both in the WHERE clause and the HAVING clause of a SQL statement.

13. Observe the following SELECT statement. What happens when there is no employee named Buehler, and what happens when there are ten Buehlers?

```
SELECT last_name, job_id FROM employees
WHERE job_id =
(SELECT job_id FROM employees WHERE last_name = 'Buehler');
```

    ➔ When there is no employee named Buehler, the part of query `(SELECT job_id FROM employees WHERE last_name = 'Buehler')` will return no rows, and the outer query will not return any results. When there are ten Buehlers, the subquery will return multiple job_ids associated with those Buehlers, and the outer query will return the last_name and job_id pairs for each of those job_ids.

14. The subqueries are processed first by the Oracle server, after which the WHERE or HAVING clause uses the results.
    True / False.
    ➔ True. In Oracle SQL, as well as in most relational database management systems (RDBMS), subqueries are processed before the WHERE or HAVING clauses in a SQL statement. This means that the subqueries are executed to retrieve their results, and then those results are used by the outer query for further filtering and processing.
15. Under what circumstances would a MERGE statement be used?
    ➔ A MERGE statement is used to perform conditional **insert, update, or delete operations** in a target table based on the data from a source table. It's typically used when you want to synchronize or reconcile data between two tables, making it especially useful for data warehousing and ETL (Extract, Transform, Load) processes.

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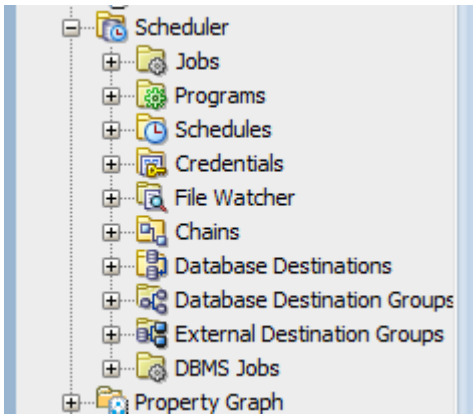
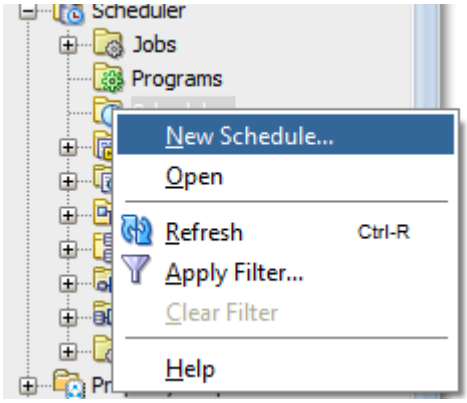
**Project two: Using the oracle SQL Developer Scheduler Option**

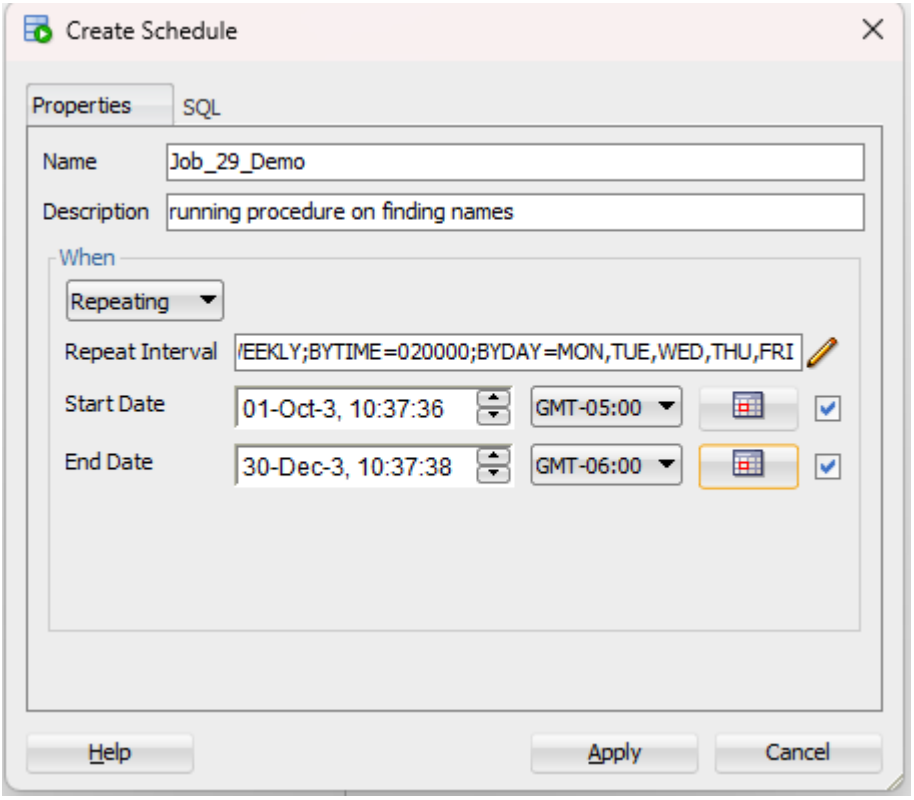
Step1: open SQL dev

Step 2: Select the scheduler – part 1




(a)




Create schedule window

(b)

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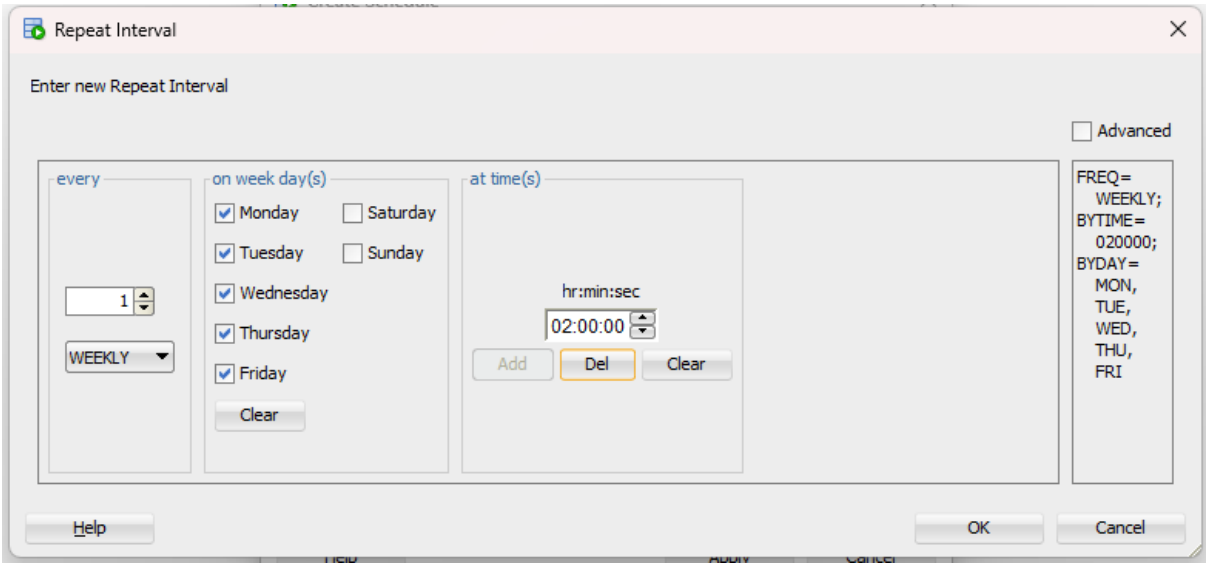
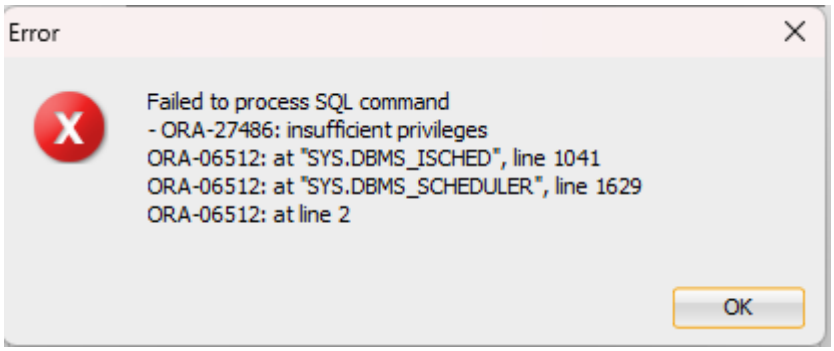
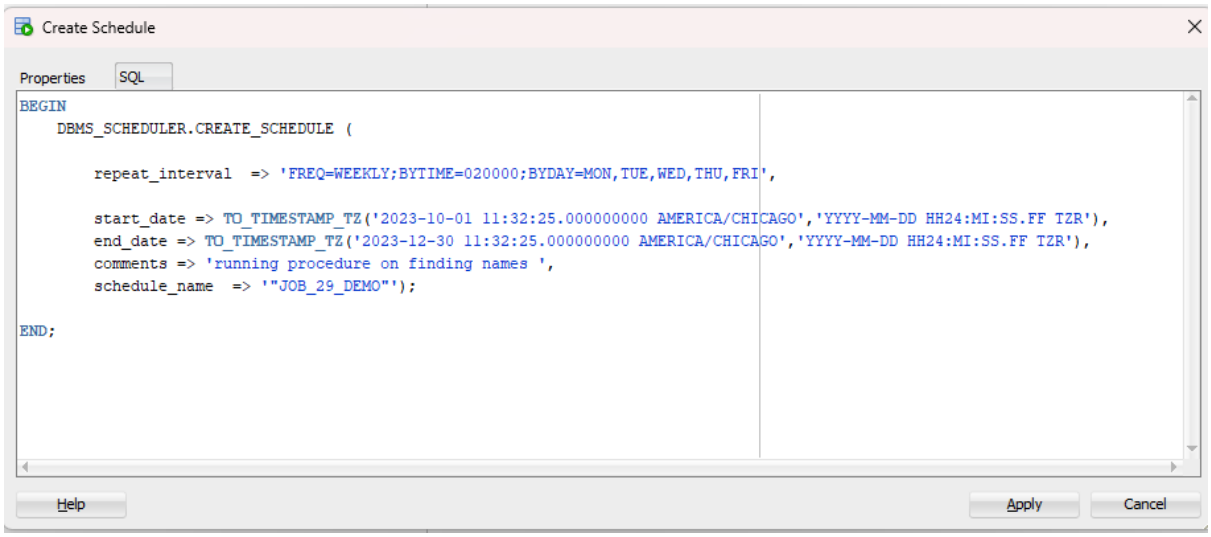



Setting up repeating interval




Output after clicking on OK.

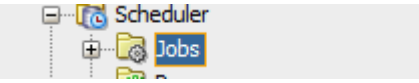
**We cannot create schedule as we don't have the necessary privileges such as of Database admin, or Database developer, etc.**



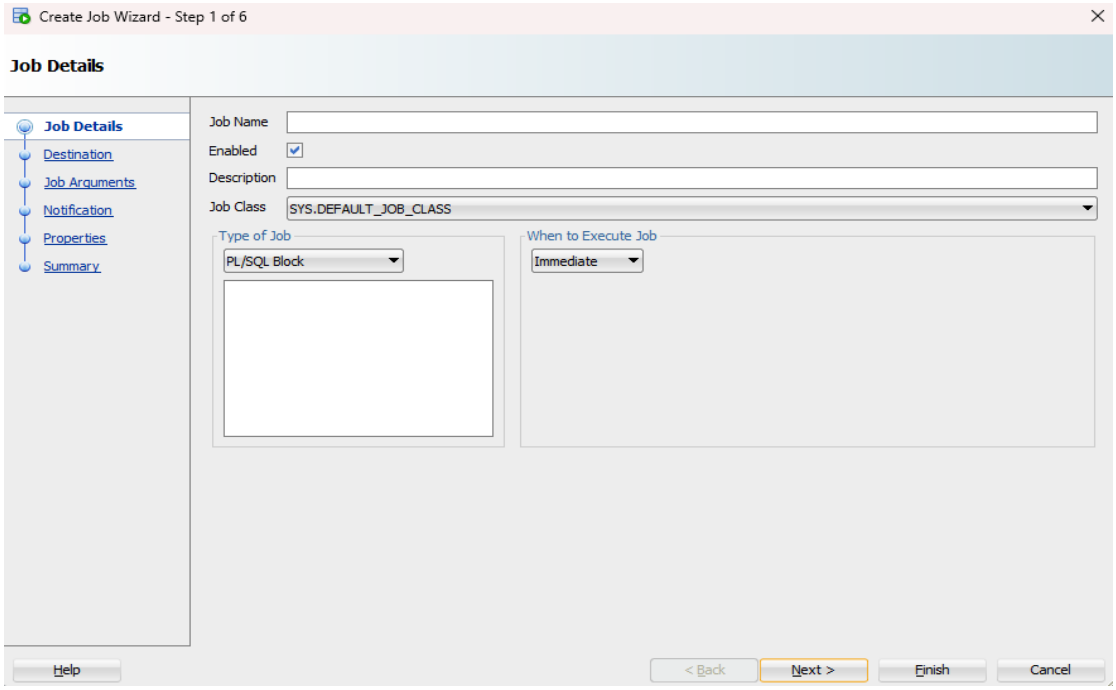

SQL view of the script used for scheduling.

### Step 2: Select the scheduler – part 2

I have attached step by step images of the steps performed in order of that images.




The job option is the sub-option of scheduler option.




New job wizard widget.

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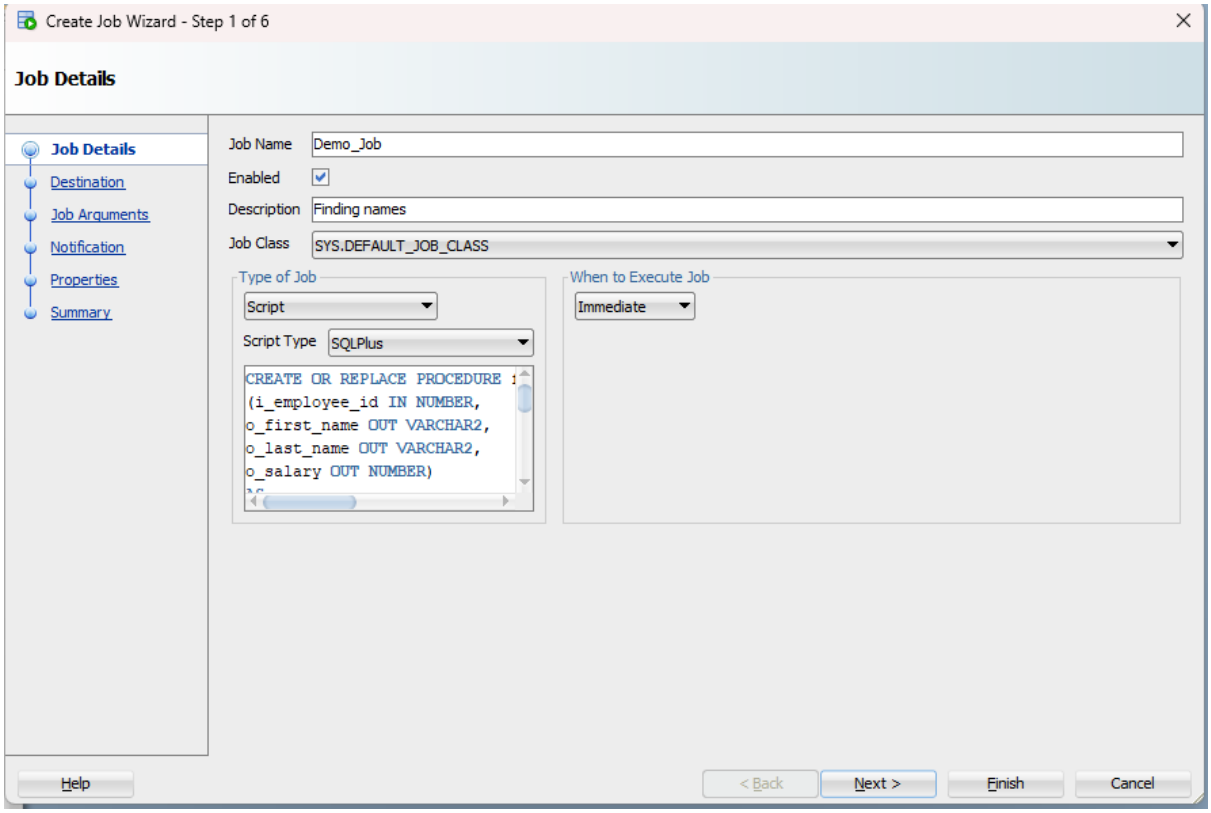
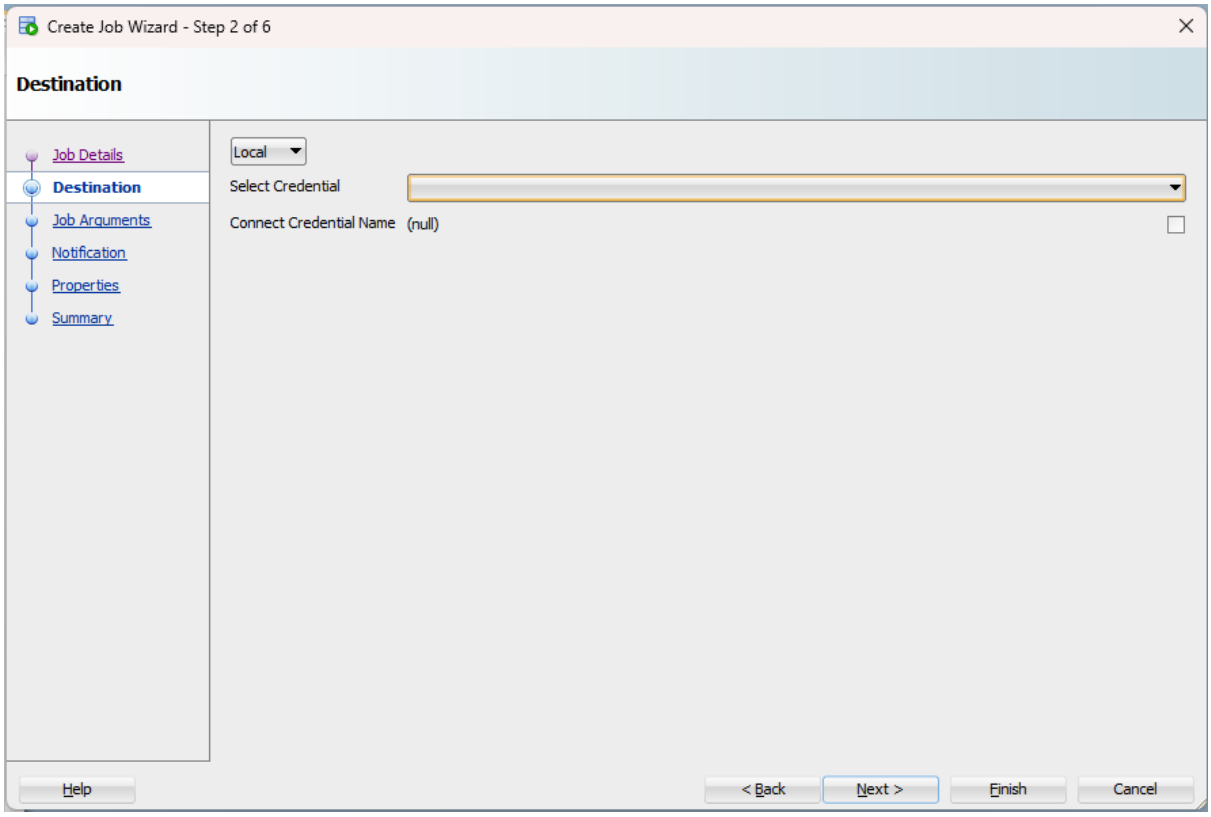
(a)



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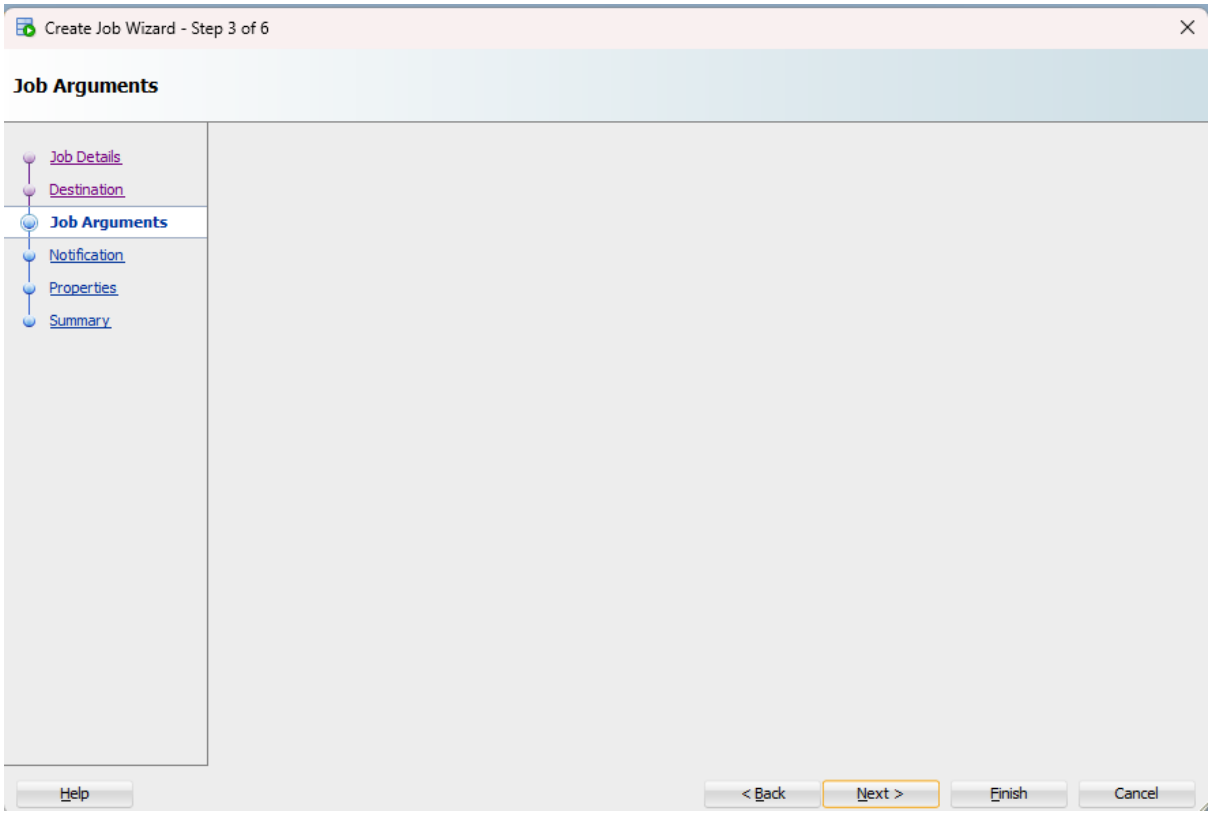
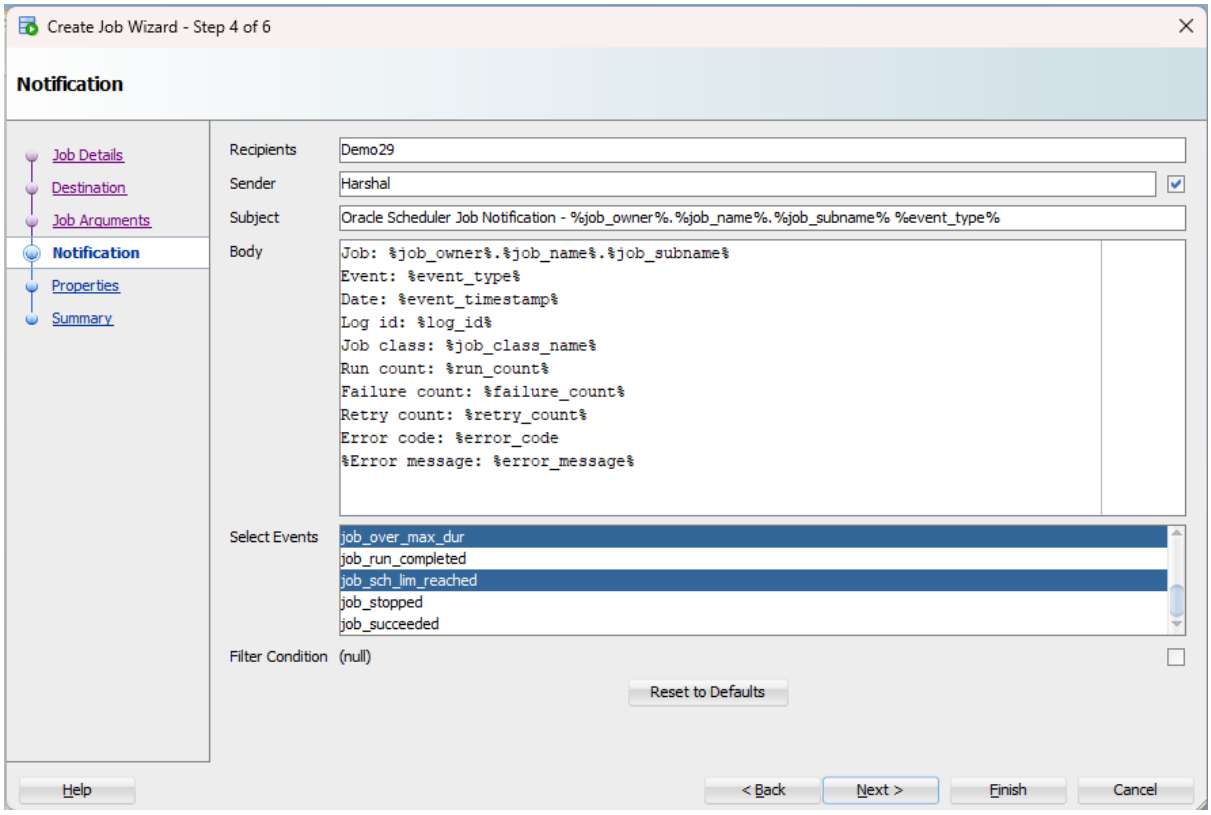



(b) (c)



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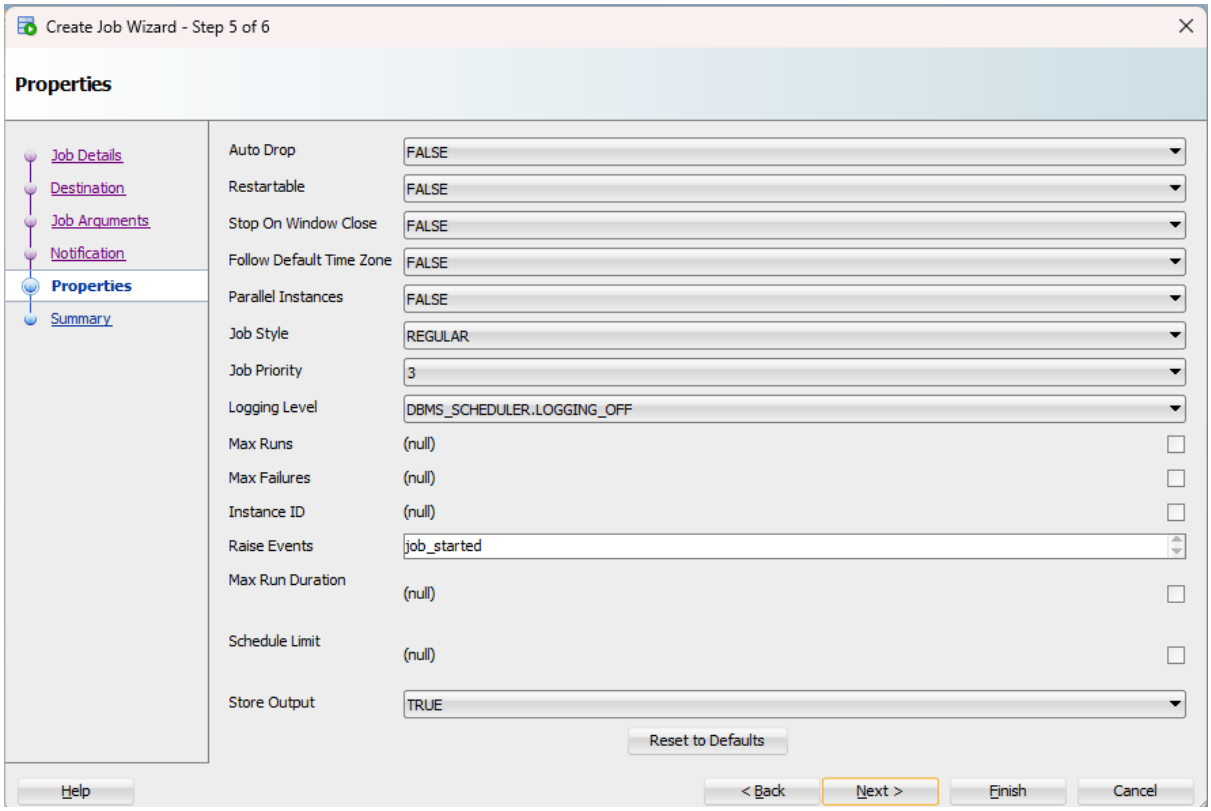


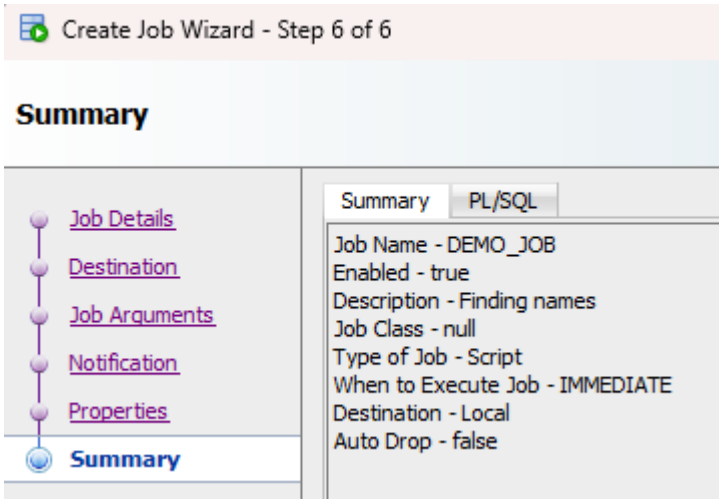


The summary observations

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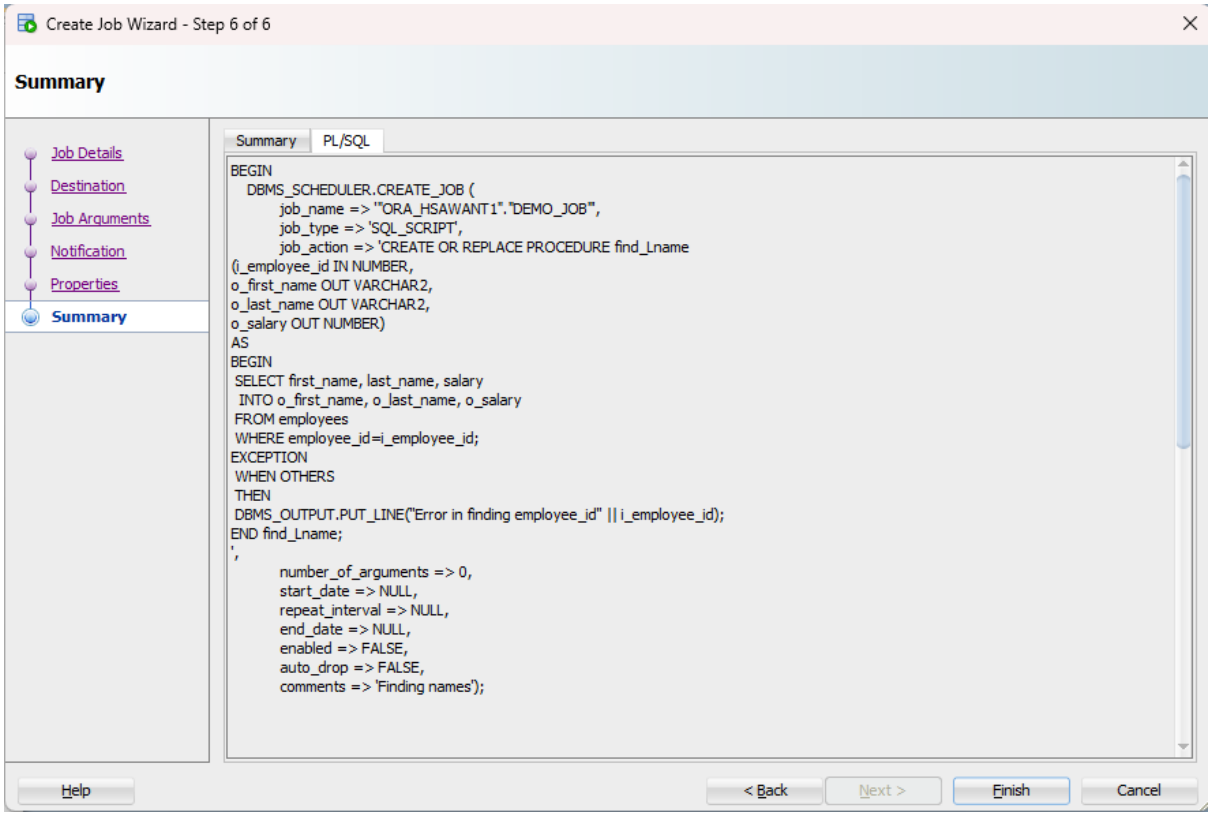


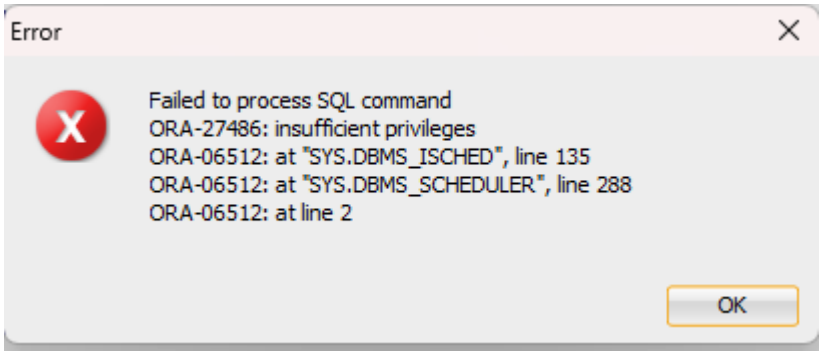

The PL/SQL view observation

PL/SQL code of job wizard:

```
BEGIN
   DBMS_SCHEDULER.CREATE_JOB (
        job_name => '"ORA_HSAWANT1"."DEMO_JOB"',
        job_type => 'SQL_SCRIPT',
        job_action => 'CREATE OR REPLACE PROCEDURE find_Lname
(i_employee_id IN NUMBER,
o_first_name OUT VARCHAR2,
o_last_name OUT VARCHAR2,
o_salary OUT NUMBER)
AS
BEGIN
 SELECT first_name, last_name, salary
```

```
 INTO o_first_name, o_last_name, o_salary
 FROM employees
WHERE employee_id=i_employee_id;
EXCEPTION
WHEN OTHERS
THEN
DBMS_OUTPUT.PUT_LINE("Error in finding employee_id" || i_employee_id);
END find_Lname;
',
        number_of_arguments => 0,
        start_date => NULL,
        repeat_interval => NULL,
        end_date => NULL,
        enabled => FALSE,
        auto_drop => FALSE,
        comments => 'Finding names');

   DBMS_SCHEDULER.SET_ATTRIBUTE(
         name => '"ORA_HSAWANT1"."DEMO_JOB"',
         attribute => 'store_output', value => TRUE);
   DBMS_SCHEDULER.SET_ATTRIBUTE(
         name => '"ORA_HSAWANT1"."DEMO_JOB"',
         attribute => 'logging_level', value => DBMS_SCHEDULER.LOGGING_OFF);

        DBMS_SCHEDULER.ADD_JOB_EMAIL_NOTIFICATION (
         job_name => '"ORA_HSAWANT1"."DEMO_JOB"',
         recipients => 'Demo29',
         sender => 'Harshal',
```

```
        subject => 'Oracle Scheduler Job Notification -
%job_owner%.%job_name%.%job_subname% %event_type%',

        body => 'Job: %job_owner%.%job_name%.%job_subname%

Event: %event_type%

Date: %event_timestamp%

Log id: %log_id%

Job class: %job_class_name%

Run count: %run_count%

Failure count: %failure_count%

Retry count: %retry_count%

Error code: %error_code

%Error message: %error_message%',

        events => 'job_broken, job_chain_stalled, job_failed, job_over_max_dur,
job_sch_lim_reached',

                filter_condition => NULL

        );

   DBMS_SCHEDULER.enable(

        name => '"ORA_HSAWANT1"."DEMO_JOB"');

END;
```




The execution was not successful due to the same error we observed in the above step, as we don't have the privileges to perform the Job.

Harshal Sawant
CWID: 20538827
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This is the last step where execution halted

Harshal Sawant
CWID: 20538827
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**Project 3: Creating and executing a procedure.**

Step 1: The stored procedure

```
CREATE OR REPLACE PROCEDURE find_Lname
(i_employee_id IN NUMBER,
o_first_name OUT VARCHAR2,
o_last_name OUT VARCHAR2,
o_salary OUT NUMBER)
AS
BEGIN
 SELECT first_name, last_name, salary
  INTO o_first_name, o_last_name, o_salary
 FROM employees
 WHERE employee_id=i_employee_id;
EXCEPTION
 WHEN OTHERS
 THEN
 DBMS_OUTPUT.PUT_LINE('Error in finding employee_id' || i_employee_id);
END find_Lname;
```

The same code above is typed in the SQL workbench.

Step 2: Run the procedure

The employee id entered was 174, so the result is -

```
Procedure FIND_LNAME compiled

Employee is: Ellen Abel.and their salary is: 11000


PL/SQL procedure successfully completed.
```

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**Step 3: Modify the procedure**

```
Procedure FIND_LNAME compiled

Employee is: Ellen Abel.and their salary is: 11000 Employee hire date is: 11-05-96 Employee JOB ID: EABEL


PL/SQL procedure successfully completed.
```

Here I have modified the procedure by adding the following two new fields:

1. Employee hire date
2. Employee Job ID

```
o_last_name OUT VARCHAR2,
o_salary OUT NUMBER,
o_hiredate OUT DATE,
o_job_id OUT VARCHAR2)
AS
BEGIN
 SELECT first_name, last_name, salary, hiredate, email
  INTO o_first_name, o_last_name, o_salary, o_hiredate, o_job_id
 FROM employees
 WHERE employee_id=i_employee_id;
EXCEPTION
 WHEN OTHERS
 THEN
 DBMS_OUTPUT.PUT_LINE('Error in finding employee_id' || i_employee_id);
END find_Lname;

-- run procedure script as anonymous block
SET SERVEROUTPUT ON
SET VERIFY OFF
DECLARE
  v_local_first_name employees.first_name%TYPE;
  v_local_last_name employees.last_name%TYPE;
  v_local_salary employees.salary%TYPE;
  v_local_hiredate employees.hiredate%TYPE;
  v_local_job_id employees.job_id%TYPE;
BEGIN
 find_Lname
  (&employee_id, v_local_first_name, v_local_last_name, v_local_salary, v_local_hiredate, v_local_job_id);
  DBMS_OUTPUT.PUT_LINE
  ('Employee is: '||v_local_first_name||' '||v_local_last_name||'.'
  || 'and their salary is: ' || v_local_salary || ' Employee hire date is: '||v_local_hiredate||' ' || 'Employee JOB ID: ' ||v_local_job_id);
END;
```

This was the code typed, which is attached above.

Harshal Sawant
CWID: 20538827
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**Project 4: Diagnosing Performance Issues – Queries for monitoring the OLAP option**

Step 1: Open the Oracle SQL Developer

Step 2: Determine the Analytical Workspaces

Firstly, I ran the following query:

**SELECT owner, aw_name, aw_version FROM DBA_AWS;**

But we got an error:

```
ORA-00942: table or view does not exist
00942. 00000 - "table or view does not exist"
*Cause:
*Action:
Error at Line: 1 Column: 40
```

So, by modifying the query, changing the DBA_AWS which is basically the database administrator's Analytical workspace, because wo don't have the necessary privileges to access the Analytical Workspace, to ALL_AWS. This contains the information about Analytical Workspaces which are accessible to the current user.

Query Result

SQL | All Rows Fetched: 6 in 0.062 seconds

| | OWNER | AW_NAME | AW_VERSION |
|---|---|---|---|
| 1 | SYS | EXPRESS | 12.0 |
| 2 | SYS | AWCREATE | 12.0 |
| 3 | SYS | AWMD | 12.0 |
| 4 | SYS | AWXML | 12.0 |
| 5 | SYS | AWREPORT | 12.0 |
| 6 | SYS | AWCREATE10G | 12.0 |

Step 3: Determine table space byte size

Even after modifying GLOBAL to express, we get error

```
Error starting at line : 1 in command -
SELECT extnum, SUM(dbms_lob.getlength(awlob)) bytes
FROM express.aw$global
GROUP BY extnum
Error at Command Line : 2 Column : 14
Error report -
SQL Error: ORA-00942: table or view does not exist
00942. 00000 -  "table or view does not exist"
*Cause:
*Action:
```

Harshal Sawant
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Step 4: Determine When the Analytical Workspaces were Created.

If I type in the code mentioned in the lab document which is –

**SELECT owner, object_name, created, status FROM dba_objects**
**WHERE object_name LIKE 'AW$%' AND object_name!='AW$'**
**GROUP BY owner, object_name, created, status**
**ORDER BY owner, object_name;**

I encounter error stating there is no table named **dba_objects**
However, if I alter the table name to ALL_objects, I get the required output.

| | OWNER | OBJECT_NAME | CREATED | STATUS |
|---|---|---|---|---|
| 1 | SYS | AW$AWCREATE | 28-06-13 | VALID |
| 2 | SYS | AW$AWCREATE10G | 28-06-13 | VALID |
| 3 | SYS | AW$AWMD | 28-06-13 | VALID |
| 4 | SYS | AW$AWREPORT | 28-06-13 | VALID |
| 5 | SYS | AW$AWXML | 28-06-13 | VALID |
| 6 | SYS | AW$EXPRESS | 28-06-13 | VALID |

This is because ALL_objects can be accessed by any user but the dba_objects is restricted to Database Administrator.

Step 5: Examine OLAP Components.

**SELECT comp_name, version, status FROM DBA_REGISTRY**
**WHERE comp_name LIKE '%OLAP%';**

Here, even If we try to access the registry's content through modifying DBA_REGISTRY to ALL_REGISTRY, we cannot retrieve the information.

Harshal Sawant
CWID: 20538827
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**Project 5: Questions on Lap Topics**

1) If one receives an error message after going through a job scheduler, such as the one seen immediately below, what troubleshooting steps should be taken?

➔ The 'ORA-27477' error indicates that the command could not be processed because the database already contained an item with the name 'FIND_NAME'. First, we may confirm the job name to make sure it is original and does not already exist, and if so, select an alternative name for the position. Second, if a job name with a comparable meaning already exists, we should change it. Additionally, confirm the user's permissions who is running the work scheduler. Check for SQL syntax mistakes and make sure all necessary parameters are supplied. Insights can also be obtained by looking at database logs or speaking with the database administrator.

2) What type of DBMS jobs are typically employed in a Fortune 1000 company?

➔ A variety of database management system (DBMS) positions are often held by Fortune 1000 businesses, some of them are:
1. Database administrators (DBAs) are in charge of upkeep and optimization of the organization's databases.
2. Data analysts: mine the DBMS's data for information to aid in decision-making.
3. Data engineers: Create structures and processes for data storage and retrieval that are effective.
4. Data architects: Make sure data models match business requirements and plan the entire data architecture.
5. Business Intelligence (BI) Developers: Create software and documents for analyzing and visualizing data.
6. Data scientists: Develop prediction models and carry out sophisticated analyses using DBMS data.
7. Database Developers: Builders and optimizers of database systems and queries are database developers.
8. Data security experts: Ensure compliance with security rules and safeguard data integrity.

3) Given the following transactions, suggest a frequency for a schedule of execution.

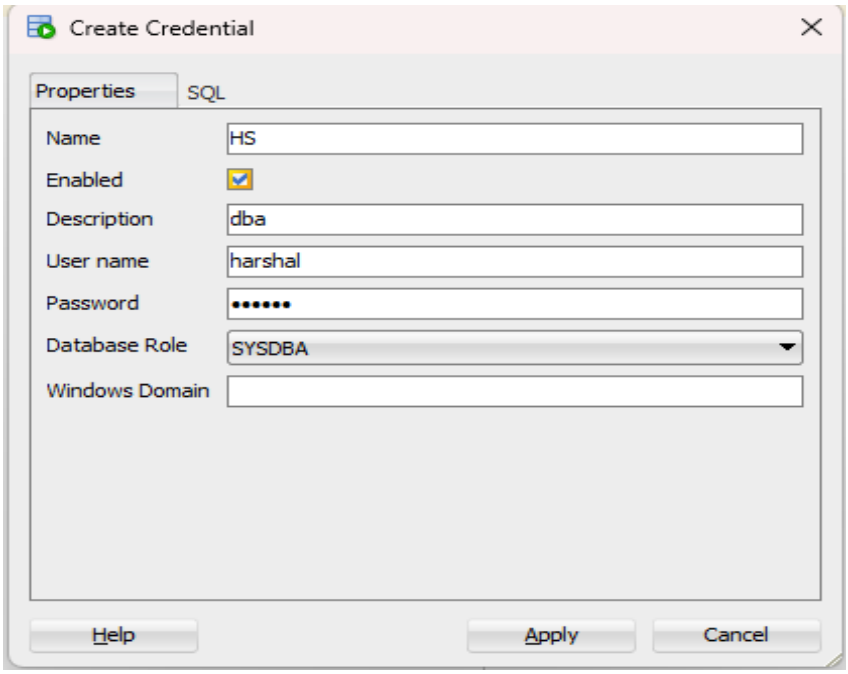
Bank Deposit
Bank Withdrawal
Inventory Update
Quarterly Sales report

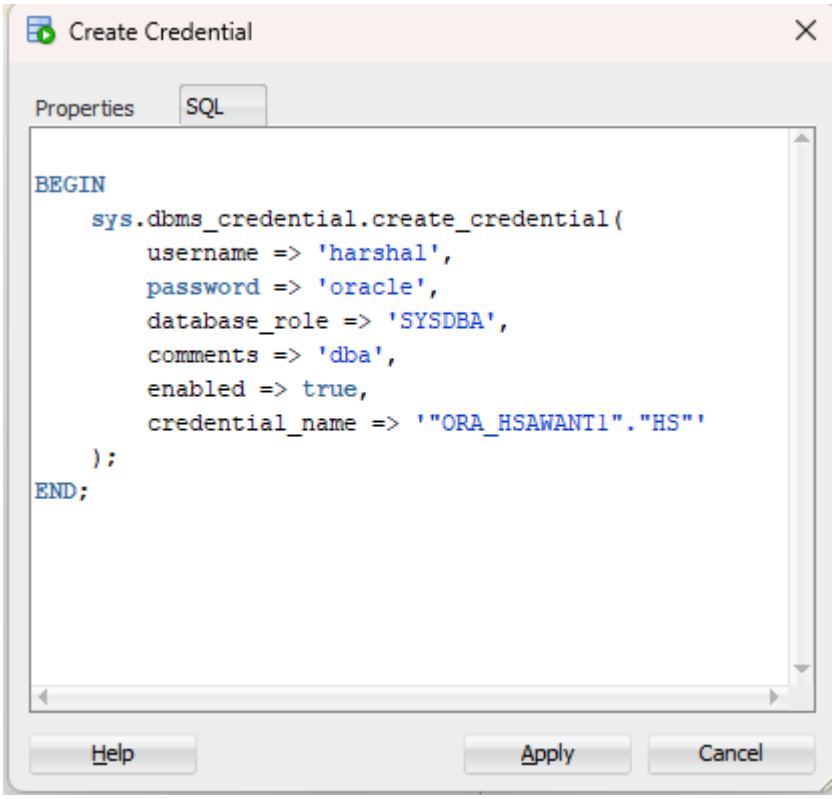
➔ The recommended frequency for each transaction in the execution schedule is generally based on the particular needs and demands of the company. But as a general principle:
1. Bank Deposit: Daily or as frequently as required to guarantee prompt processing of cash.
2. Bank Withdrawal: As Required, Depending on the Business's Cash Flow Needs.
3. Inventory Update: Regular inventory updates, such as daily, weekly, or

monthly ones, are necessary to keep correct inventory levels.
4. Quarterly Sales Report: As indicated by the report's name, quarterly.
In the end, the frequency should be in line with the operational and reporting requirements of the firm.

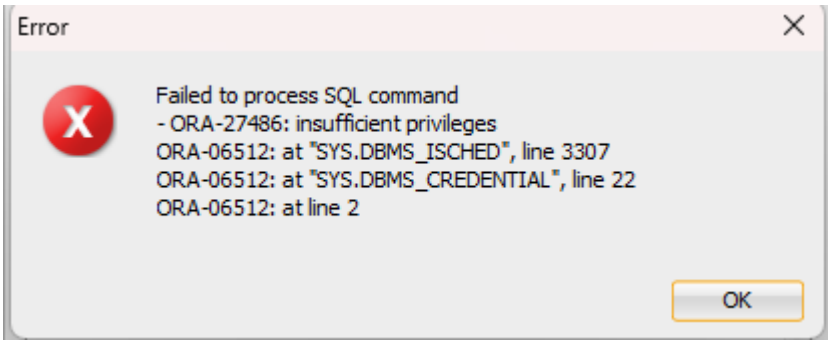
4) The following window is shown when a Credential (under the Schedular Folder) is to be created (along with an example of the SQL Script created from the Window entries):
Why is it necessary to create a Credential?

➔ For the purposes of access restrictions and security, credentials are crucial. Credentials securely hold sensitive data in an encrypted format, including usernames and passwords. By restricting access controls, it also helps. To monitor which credentials were used to complete the work, it is utilized for audit trails. A smart security technique that ensures compliance and makes managing access to diverse resources inside a system easier is using credentials in scheduler.






SQL script which is created automatically on basis of properties entered




This is the same output we are encountering, as we don't have the necessary privileges.

Harshal Sawant
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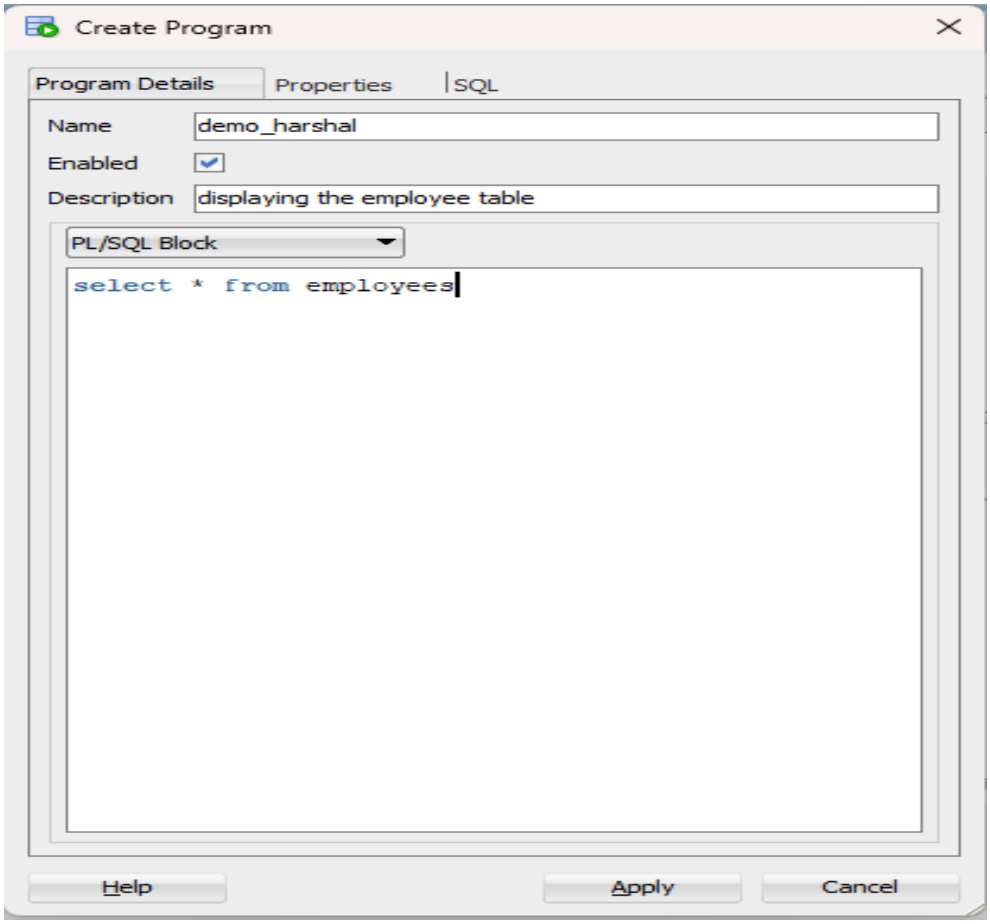
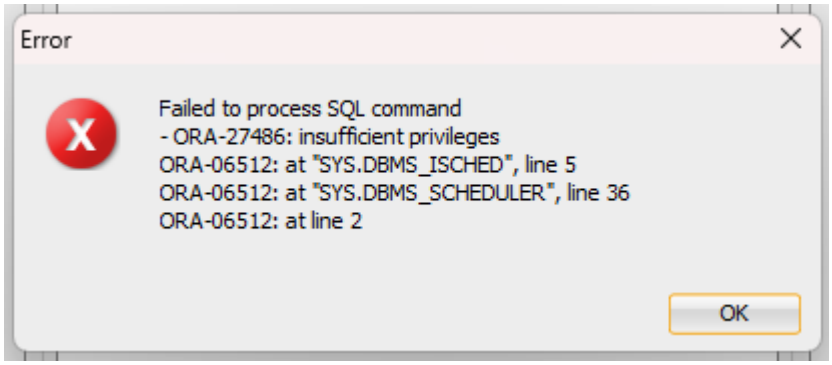
5) Create a program




Creating a program's window

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