

NSHURO ARNAUD NELLIGAN

27960

PHASE 7

Objective:

Implement business rules, auditing, and advanced database features using PL/SQL triggers and functions to enforce security restrictions and record violations.

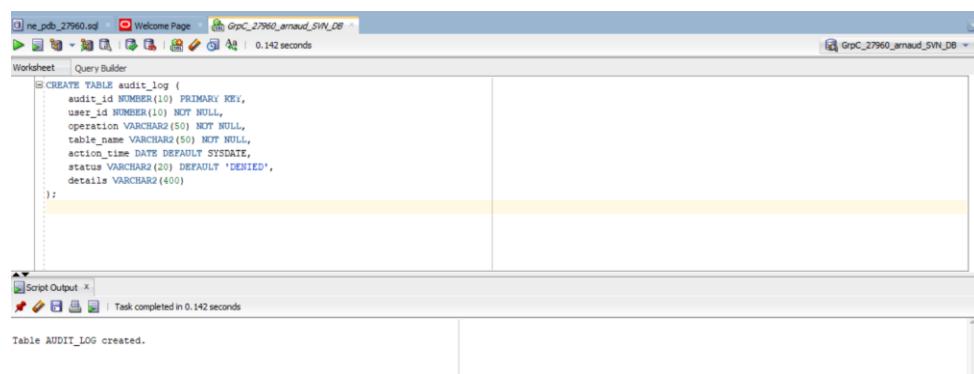
1. Business Rule

Critical Rule:

- Employees cannot **INSERT/UPDATE/DELETE** on:
 - **Weekdays (Monday–Friday)**
 - **Public holidays (upcoming month only)**
- All attempted actions must be logged in an **audit table**.

2. Tables for Auditing

Audit Log Table



The screenshot shows the Oracle SQL Developer interface with a query editor window. The code in the editor is:

```
CREATE TABLE audit_log (
    audit_id NUMBER(10) PRIMARY KEY,
    user_id NUMBER(10) NOT NULL,
    operation VARCHAR2(50) NOT NULL,
    table_name VARCHAR2(50) NOT NULL,
    action_time DATE DEFAULT SYSDATE,
    status VARCHAR2(20) DEFAULT 'DENIED',
    details VARCHAR2(400)
);
```

The output pane below the editor shows the message "Table AUDIT_LOG created." indicating the successful execution of the command.

Holiday Table

```

CREATE TABLE holidays (
    holiday_date DATE PRIMARY KEY,
    description VARCHAR2(100)
);

```

Table HOLIDAYS created.

3. Audit Logging Function

```

CREATE OR REPLACE FUNCTION log_audit(
    p_user_id NUMBER,
    p_operation VARCHAR2,
    p_table_name VARCHAR2,
    p_status VARCHAR2,
    p_details VARCHAR2
) RETURN NUMBER IS
    v_audit_id NUMBER;
BEGIN
    SELECT NVL(MAX(audit_id),0)+1 INTO v_audit_id FROM audit_log;

    INSERT INTO audit_log(audit_id, user_id, operation, table_name, status, details)
    VALUES(v_audit_id, p_user_id, p_operation, p_table_name, p_status, p_details);

    COMMIT;
    RETURN v_audit_id;
END log_audit;
/

```

Function LOG_AUDIT compiled

4. Restriction Check Function

```

CREATE OR REPLACE FUNCTION check_restriction RETURN BOOLEAN IS
    v_day VARCHAR2(10);
    v_count NUMBER;
BEGIN
    -- Get current day abbreviation
    SELECT TO_CHAR(SYSDATE,'DY','NLS_DATE_LANGUAGE=ENGLISH') INTO v_day FROM dual;

    -- Weekday restriction
    IF v_day IN ('MON','TUE','WED','THU','FRI') THEN
        RETURN FALSE;
    END IF;

    -- Public holiday restriction
    SELECT COUNT(*) INTO v_count
    FROM holidays
    WHERE holiday_date = TRUNC(SYSDATE);

    IF v_count > 0 THEN
        RETURN FALSE;
    END IF;

    -- Allowed
    RETURN TRUE;
END check_restriction;
/

```

Function CHECK_RESTRICTION compiled