AMERICAN INTERNATIONAL UNIVERSITY–BANGLADESH (AIUB)
Department of the Faculty of Science and Technology
Summer 2024-2025
Final Term Project Documentations on
Laundry Service Management System

Supervised By
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Name	ID	Contribution
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ADVANCED DATABASE MANAGEMENT SYSTEM
Section: B
Group No: 04
Contents:

Project Updates

1.Normalization:

1) SERVE

UNF:

1. serve (**c_id,** c_name, c_email, c_phone, c_address, **l_id,** l_phone, l_address)

1NF:

c_phone and c_email are multi-valued attributes.

1. **c_id**, c_name, c_email, c_phone, c_address, **l_id**, l_phone, l_address

2NF:

1. **c_id,** c_name, c_email, c_phone, c_address
2. **l_id** , l_phone, l_address

3NF:

There is no transitive dependency. Relation already in 3NF .

1. **_c_id_ ,** c_name, c_email, c_phone, c_address
2**.l_id,** l_phone, l_address

Table Creation:

1. **_c_id** , c_name, c_email, c_phone, c_address
2**. _l_id_ ,** l_phone, l_address, **c_id** .

2) HAVE

UNF:

1. Have (**l_id**, l_phone, l_address, **e_id,** e_name, e_dob , e_phone, e_address)

1NF:

There is no multi valued attribute. Relation already in 1NF.

1. **l_id**, l_phone, l_address**, e_id,** e_name, e_dob , e_phone, e_address

2NF:

1. **_e_id_ ,** e_name, e_dob, e_phone, e_address
2. **_l_id_** , l_phone, l_address

3NF:

There is no transitive dependency. Relation already in 3NF.

1. **e_id** , e_name, e_phone, e_address
2. **l_id**, l_phone, l_address

Table Creation :

1. **e_id,** e_name, e_phone, e_address
2**. l_id**, l_phone, l_address, **e_id**

3) PROVIDED

UNF:
Provided (**c_id**, c_name, c_email, c_phone, c_address, m_id, m_name, m_phone)

1NF:
c_phone and c_email are multi-valued attributes.
1. c_id, c_name, c_email, c_phone, c_address, m_id, m_name, m_phone
2NF:
1.**c_id**, c_name, c_email, c_phone, c_address,
2. **m_id** , m_name, m_phone
3NF:
There is no transitive dependency. Relation already in 3NF.
1.**c_id**, c_name, c_email, c_phone, c_address
2. **m_id** , m_name, m_phone
Table Creation:
1.**c_id**, c_name, c_email, c_phone, c_address
2. **m_id** , m_name, m_phone
3.**c_id**, **m_id**

4) PAY
UNF:
Pay (**c_id**, c_name, c_email, c_phone, c_address, **u_id**, u_paytype, u_due)
1NF:
c_phone and c_email are multi-valued attributes.
1. **c_id**, c_name, c_email, c_phone, c_address, **u_id**, u_paytype, u_due.
2NF:
1.**c_id**, c_name, c_email, c_phone, c_address
2. **u_id**, u_paytype, u_due.
3NF:
There is no transitive dependency. Relation already in 3NF.
1.**c_id**, c_name, c_email, c_phone, c_address
2. **u_id**, u_paytype, u_due.
Table Creation:
1.**c_id**, c_name, c_email, c_phone, c_address
2. **u_id**, u_paytype, u_due.
3.**c_id**, **u_id**

5) OWNS
UNF:
owns (**o_id**, o_name, o_email, o_phone, o_address, **l_id**, l_phone, l_address)
1NF:

There is no multi-valued attribute. Relation already in 1NF.

1. **o_id** , o_name, o_email, o_phone, o_address, **l_id** , l_phone, l_address

2NF:

1.**o_id**, o_name, o_email, o_phone, o_address

2.**l_id**, l_phone, l_address

3NF:

There is no transitive dependency. Relation already in 3NF.

1. **o_id** , o_name, o_email, o_phone, o_address s

2. **l_id** , l_phone, l_address

Table Creation :

1. **o_id** , o_name, o_email, o_phone, o_address

2. **l_id** , l_phone, l_address

3. **o_id** , **l_id**

6) OFFER

UNF:

offer (**l_id**, l_phone, l_address, **h_id**, h_pdate, h_ddate, h_address)

1NF:

There is no multi-valued attribute. Relation already in 1NF.

1. **l_id**, l_phone, l_address, **h_id**, h_pdate, h_ddate, h_address

2NF:

1. **h_id** , h_pdate, h_ddate, h_address

2. **l_id**, l_phone, l_address

3NF:

There is no transitive dependency. Relation already in 3NF.

1. **h_id** , h_pdate, h_ddate, h_address

2. **l_id**, l_phone, l_address

Table Creation:

1. **h_id** , h_pdate, h_ddate, h_address

2. **l_id**, l_phone, l_address ,**h_id**

Temporary table :

1. **c_id** , c_name, c_email, c_phone, c_address
2. **l_id ,** l_phone, l_address, **c_id** .
3. **e_id,** e_name, e_phone, e_address
4. **l_id**, l_phone, l_address, **e_id**
5. **c_id**, c_name, c_email, c_phone, c_address …….x
6. **m_id** , m_name, m_phone
7. **c_id**, **m_id**
8. **c_id**, c_name, c_email, c_phone, c_address ……x

9. **u_id**, u_paytype, u_due.
10. **c_id**, **u_id**
11. **o_id** , o_name, o_email, o_phone, o_address
12. **l_id** , l_phone, l_address
13. **o_id** , **l_id**
14. **h_id** , h_pdate, h_ddate, h_address
15. **l_id**, l_phone, l_address ,**h_id**

Final tables

1. **_c_id**, c_name, c_email, c_phone, c_address
2. **_l_id_** , l_phone, l_address, **c_id** ,**e_id_**, **h_id**
3. **e_id**, e_name, e_phone, e_address
4. **m_id**, m_name, m_phone
5. **c_id**, **m_id**
6. **u_id**, u_paytype, u_due.
7. **c_id**, **u_id**
8. **o_id**, o_name, o_email, o_phone, o_address
9. **o_id**,**l_id**
10. **h_id**, h_pdate, h_ddate, h_address

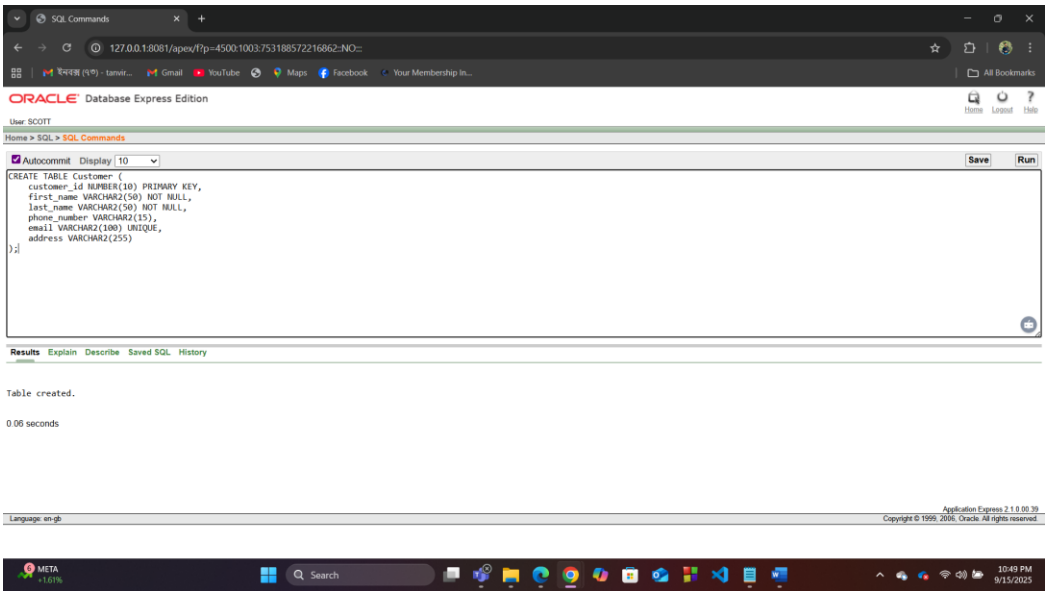
Table Name:

1. Customer
2. Laundry_Service
3. Employee
4. Membership_Card
5. Customer_Membership
6. Utilities_Bill
7. Customer_Utilities
8. Owner
9. Owner_Laundry_Service
10. Home_Service

Table Creation Using SQL:

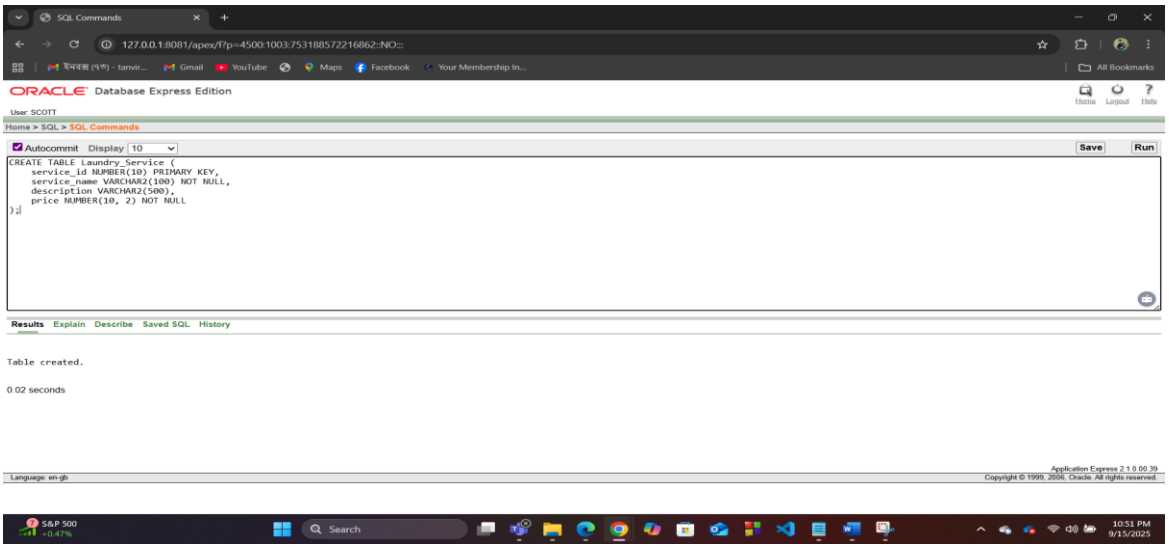
1.Customer:

```
CREATE TABLE Customer (
customer_id NUMBER(10) PRIMARY KEY,
first_name VARCHAR2(50) NOT NULL,
last_name VARCHAR2(50) NOT NULL,
phone_number VARCHAR2(15),
email VARCHAR2(100) UNIQUE,
address VARCHAR2(255));
```



2. Laundry_Service

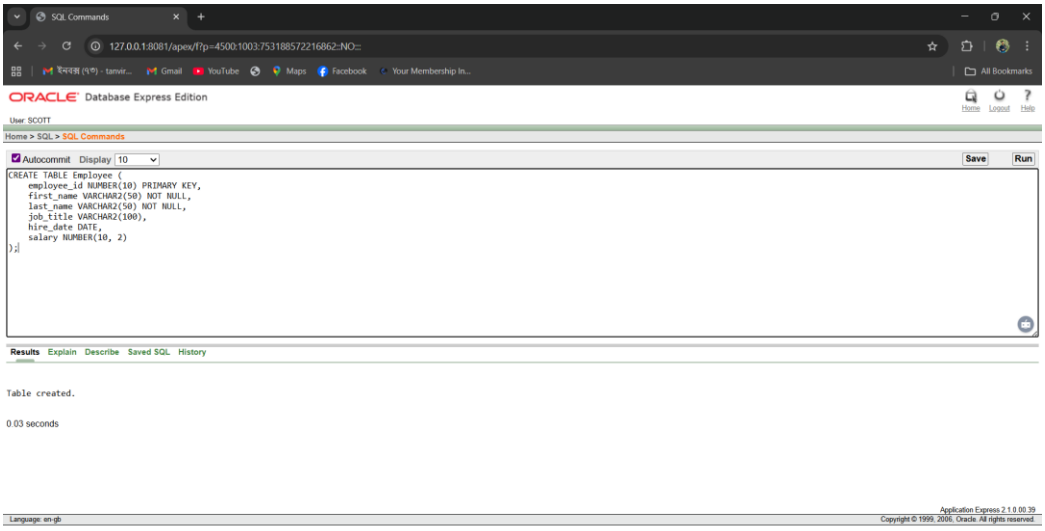
```
CREATE TABLE Laundry_Service (
service_id NUMBER(10) PRIMARY KEY,
service_name VARCHAR2(100) NOT NULL,
description VARCHAR2(500),
price NUMBER(10, 2) NOT NULL
);
```



3. Employee

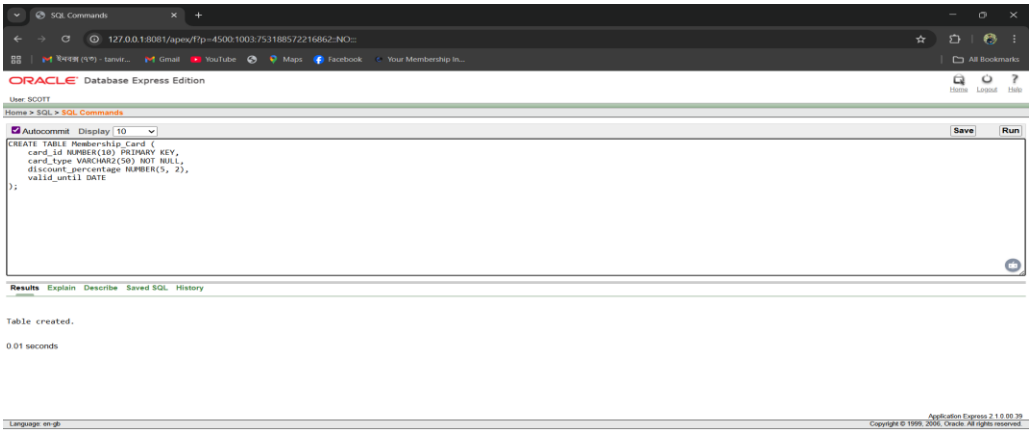
```
CREATE TABLE Employee (
employee_id NUMBER (10) PRIMARY KEY,
first_name VARCHAR2(50) NOT NULL,
last_name VARCHAR2(50) NOT NULL,
job_title VARCHAR2(100),
```

```
    hire_date DATE,
    salary NUMBER (10, 2)
);
```



4. Membership_Card

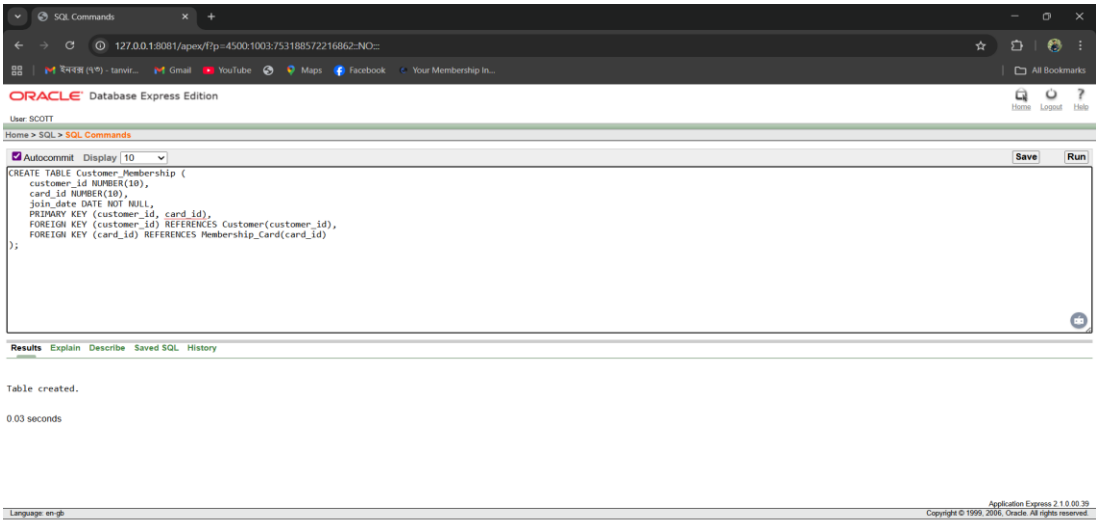
```
    CREATE TABLE Membership_Card (
    card_id NUMBER (10) PRIMARY KEY,
    card_type VARCHAR2(50) NOT NULL,
    discount_percentage NUMBER (5, 2),
    valid_until DATE);
```



5. Customer_Membership

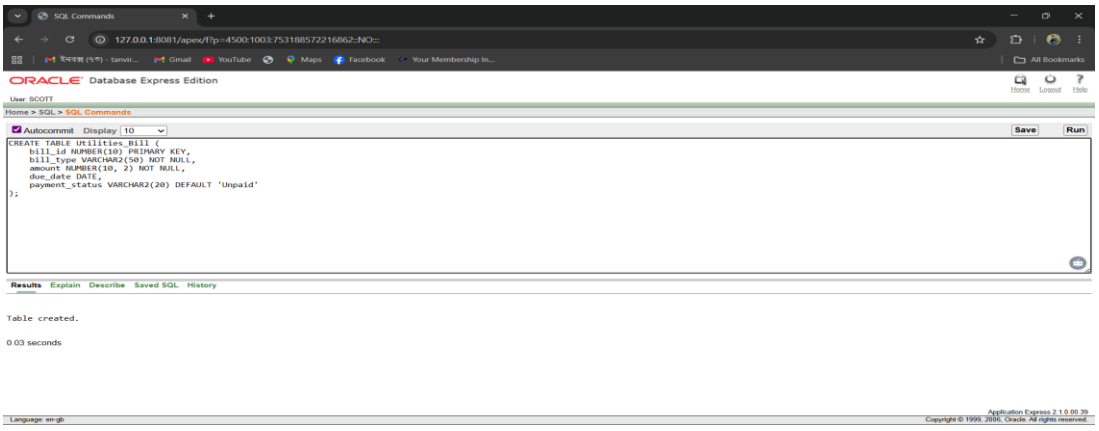
```
    CREATE TABLE Customer_Membership (
    customer_id NUMBER(10),
    card_id NUMBER(10),
    join_date DATE NOT NULL,
```

```
PRIMARY KEY (customer_id, card_id),
FOREIGN KEY (customer_id) REFERENCES Customer(customer_id),
FOREIGN KEY (card_id) REFERENCES Membership_Card(card_id));
```



6. Utilities_Bill

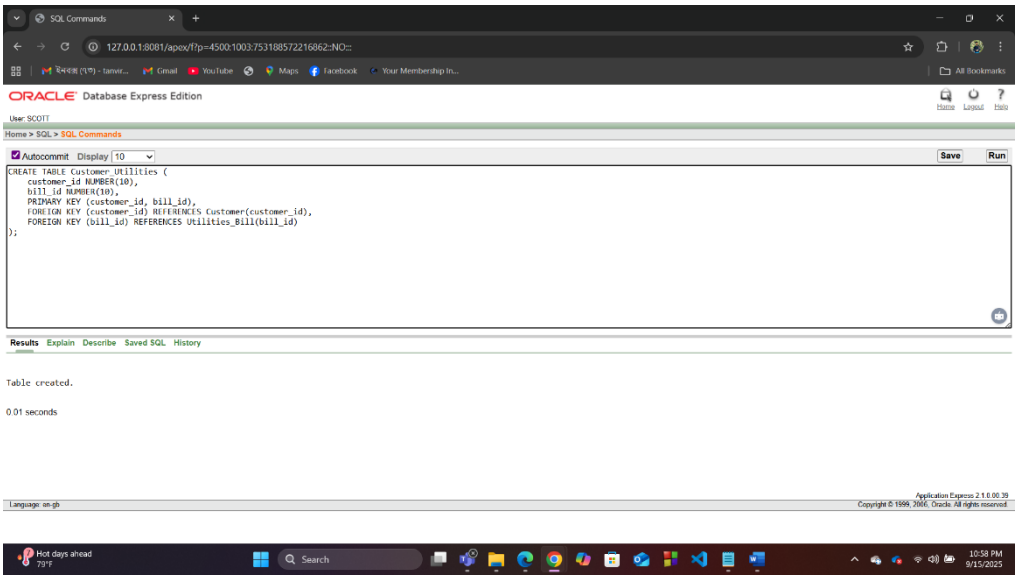
```
CREATE TABLE Utilities_Bill (
bill_id NUMBER(10) PRIMARY KEY,
bill_type VARCHAR2(50) NOT NULL,
amount NUMBER(10, 2) NOT NULL,
due_date DATE,
payment_status VARCHAR2(20) DEFAULT 'Unpaid');
```



7.Customer_Utilities

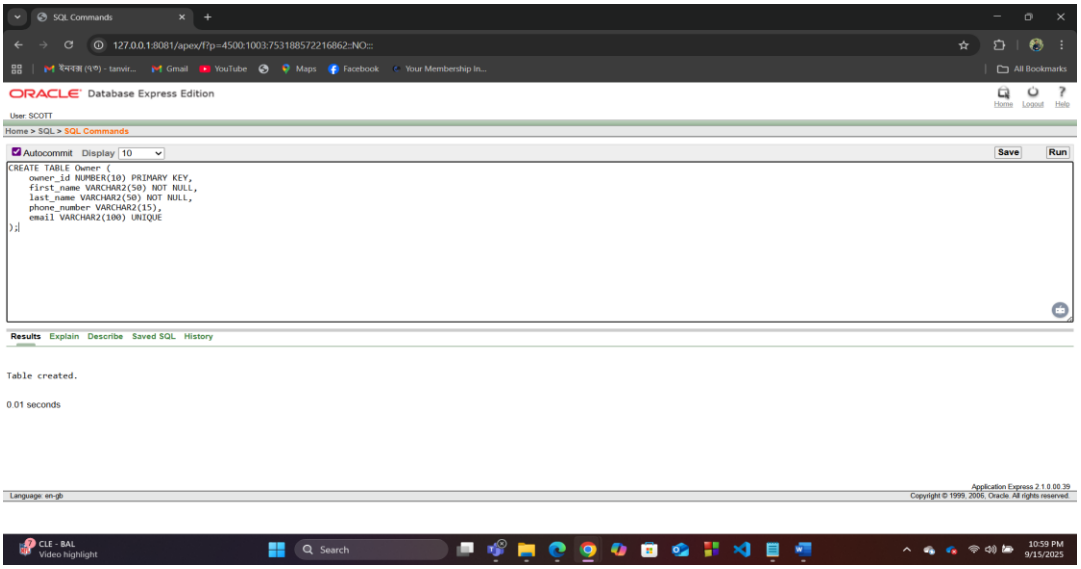
```
CREATE TABLE Customer_Utilities (
customer_id NUMBER(10),
bill_id NUMBER(10),
PRIMARY KEY (customer_id, bill_id),
```

FOREIGN KEY (customer_id) REFERENCES Customer(customer_id),
FOREIGN KEY (bill_id) REFERENCES Utilities_Bill(bill_id));



8. Owner

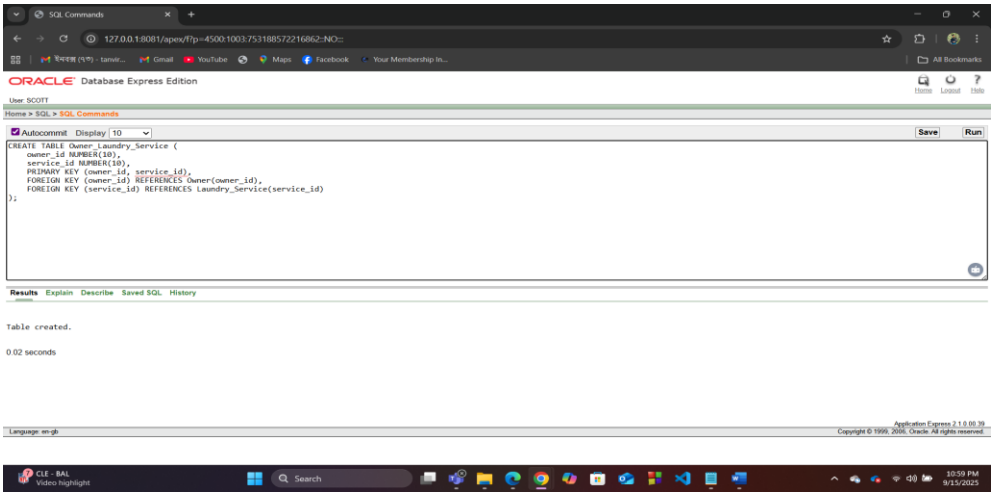
CREATE TABLE Owner (
owner_id NUMBER(10) PRIMARY KEY,
first_name VARCHAR2(50) NOT NULL,
last_name VARCHAR2(50) NOT NULL,
phone_number VARCHAR2(15),
email VARCHAR2(100) UNIQUE);



9. Owner Laundry Service:

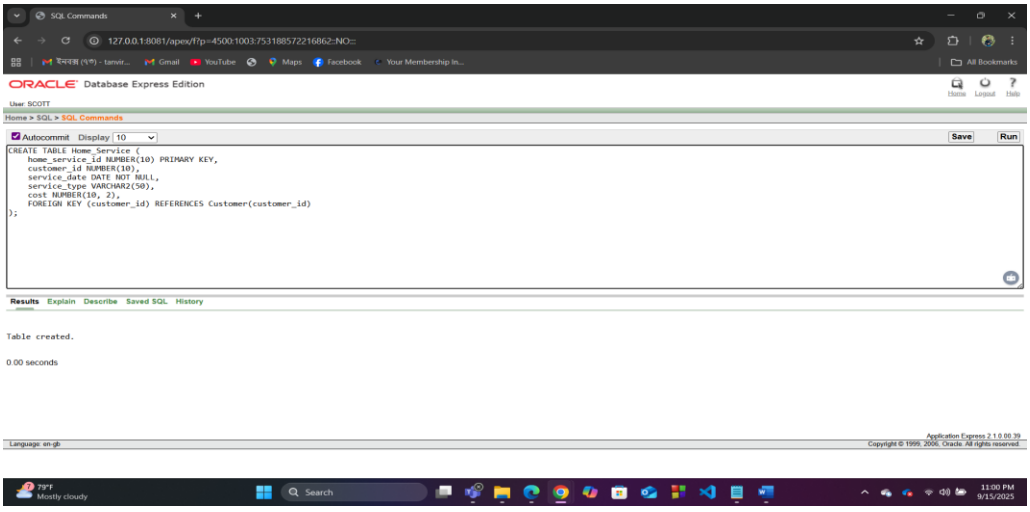
CREATE TABLE Owner_Laundry_Service (
owner_id NUMBER(10),
service_id NUMBER(10),

PRIMARY KEY (owner_id, service_id),
FOREIGN KEY (owner_id) REFERENCES Owner(owner_id),
FOREIGN KEY (service_id) REFERENCES Laundry_Service(service_id));



10. Home_Service

CREATE TABLE Home_Service (
home_service_id NUMBER(10) PRIMARY KEY,
customer_id NUMBER(10),
service_date DATE NOT NULL,
service_type VARCHAR2(50),
cost NUMBER(10, 2),
FOREIGN KEY (customer_id) REFERENCES Customer(customer_id));

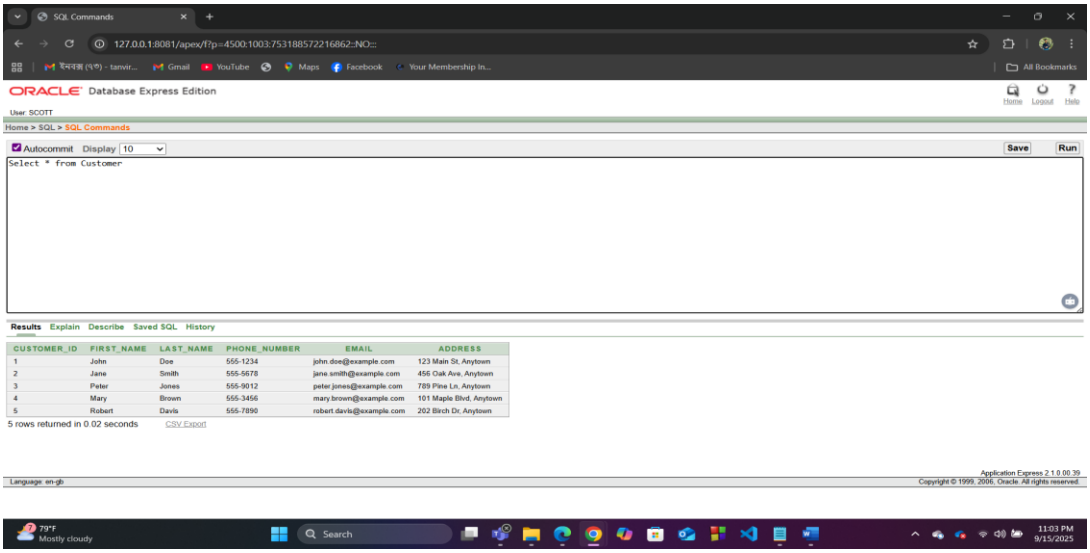


Data Insertion Using SQL:

1.Customer :

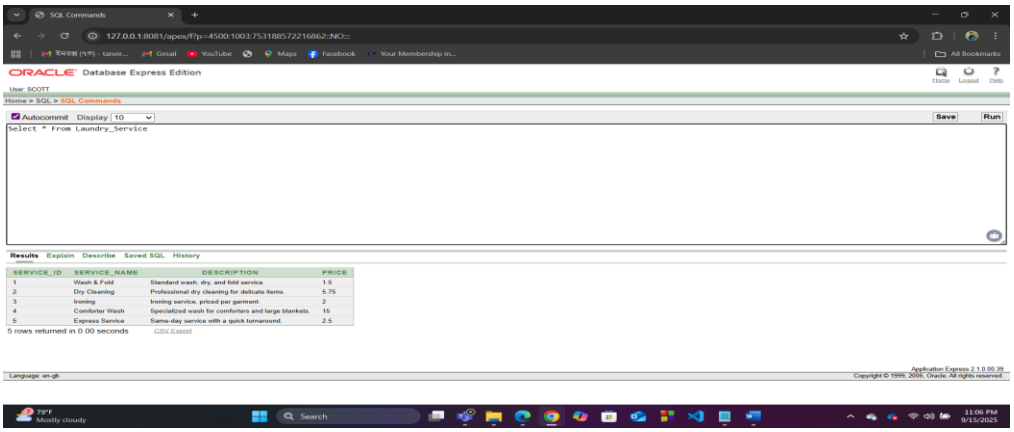
INSERT INTO Customer (customer_id, first_name, last_name, phone_number, email, address) VALUES (1, 'John', 'Doe', '555-1234', 'john.doe@example.com', '123 Main St, Anytown');

INSERT INTO Customer (customer_id, first_name, last_name, phone_number, email, address) VALUES (2, 'Jane', 'Smith', '555-5678', 'jane.smith@example.com', '456 Oak Ave, Anytown');
INSERT INTO Customer (customer_id, first_name, last_name, phone_number, email, address) VALUES (3, 'Peter', 'Jones', '555-9012', 'peter.jones@example.com', '789 Pine Ln, Anytown');
INSERT INTO Customer (customer_id, first_name, last_name, phone_number, email, address) VALUES (4, 'Mary', 'Brown', '555-3456', 'mary.brown@example.com', '101 Maple Blvd, Anytown');
INSERT INTO Customer (customer_id, first_name, last_name, phone_number, email, address) VALUES (5, 'Robert', 'Davis', '555-7890', 'robert.davis@example.com', '202 Birch Dr, Anytown');



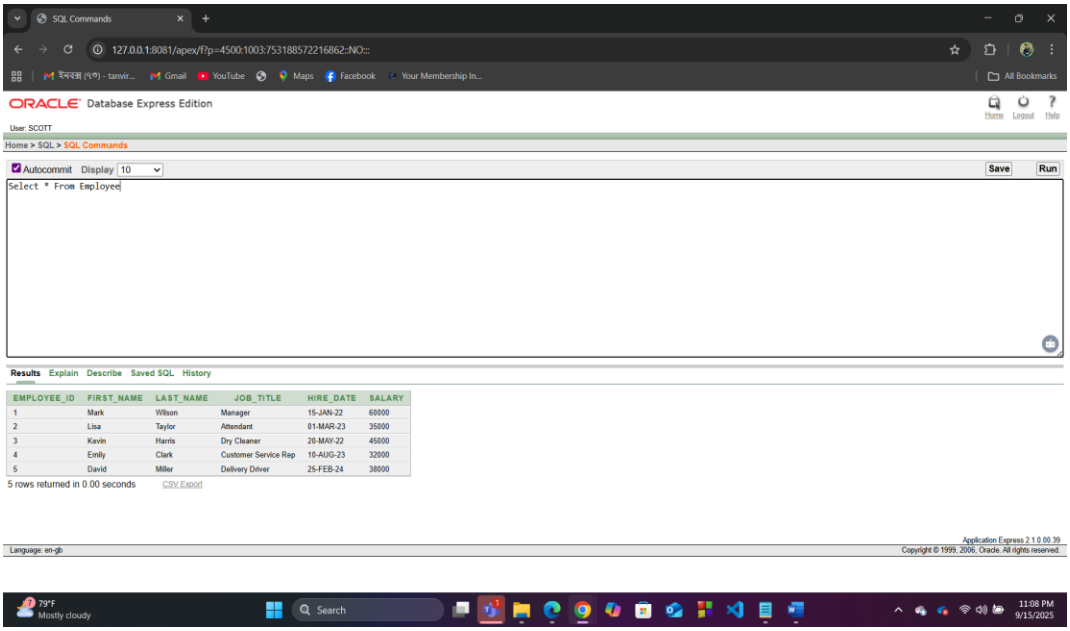
2. Laundry Service:

INSERT INTO Laundry_Service (service_id, service_name, description, price) VALUES (1, 'Wash & Fold', 'Standard wash, dry, and fold service.', 1.50);
INSERT INTO Laundry_Service (service_id, service_name, description, price) VALUES (2, 'Dry Cleaning', 'Professional dry cleaning for delicate items.', 5.75);
INSERT INTO Laundry_Service (service_id, service_name, description, price) VALUES (3, 'Ironing', 'Ironing service, priced per garment.', 2.00);
INSERT INTO Laundry_Service (service_id, service_name, description, price) VALUES (4, 'Comforter Wash', 'Specialized wash for comforters and large blankets.', 15.00);
INSERT INTO Laundry_Service (service_id, service_name, description, price) VALUES (5, 'Express Service', 'Same-day service with a quick turnaround.', 2.50);



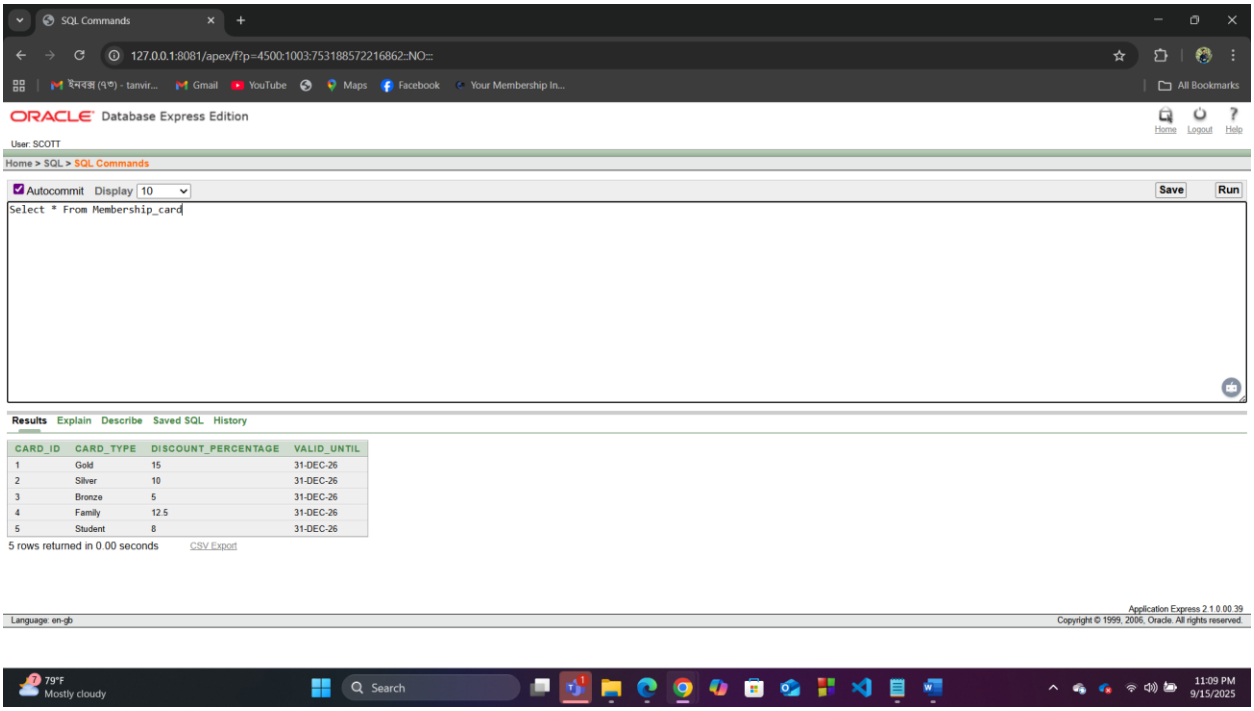
3. Employee :

INSERT INTO Employee (employee_id, first_name, last_name, job_title, hire_date, salary) VALUES (1, 'Mark', 'Wilson', 'Manager', TO_DATE('2022-01-15', 'YYYY-MM-DD'), 60000.00);
INSERT INTO Employee (employee_id, first_name, last_name, job_title, hire_date, salary) VALUES (2, 'Lisa', 'Taylor', 'Attendant', TO_DATE('2023-03-01', 'YYYY-MM-DD'), 35000.00);
INSERT INTO Employee (employee_id, first_name, last_name, job_title, hire_date, salary) VALUES (3, 'Kevin', 'Harris', 'Dry Cleaner', TO_DATE('2022-05-20', 'YYYY-MM-DD'), 45000.00);
INSERT INTO Employee (employee_id, first_name, last_name, job_title, hire_date, salary) VALUES (4, 'Emily', 'Clark', 'Customer Service Rep', TO_DATE('2023-08-10', 'YYYY-MM-DD'), 32000.00);
INSERT INTO Employee (employee_id, first_name, last_name, job_title, hire_date, salary) VALUES (5, 'David', 'Miller', 'Delivery Driver', TO_DATE('2024-02-25', 'YYYY-MM-DD'), 38000.00);



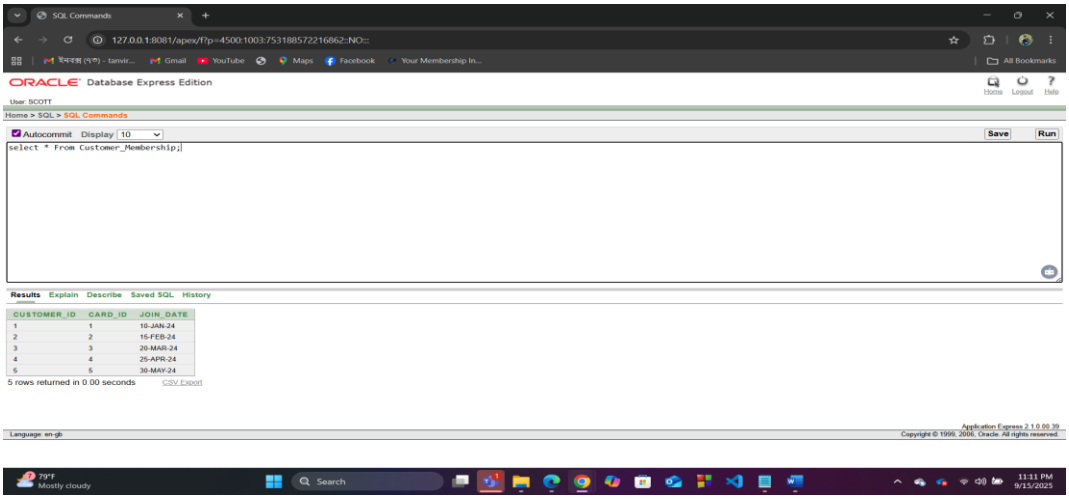
4.Membership_Card :

INSERT INTO Membership_Card (card_id, card_type, discount_percentage, valid_until) VALUES (1, 'Gold', 15.00, TO_DATE('2026-12-31', 'YYYY-MM-DD'));
INSERT INTO Membership_Card (card_id, card_type, discount_percentage, valid_until) VALUES (2, 'Silver', 10.00, TO_DATE('2026-12-31', 'YYYY-MM-DD'));
INSERT INTO Membership_Card (card_id, card_type, discount_percentage, valid_until) VALUES (3, 'Bronze', 5.00, TO_DATE('2026-12-31', 'YYYY-MM-DD'));
INSERT INTO Membership_Card (card_id, card_type, discount_percentage, valid_until) VALUES (4, 'Family', 12.50, TO_DATE('2026-12-31', 'YYYY-MM-DD'));
INSERT INTO Membership_Card (card_id, card_type, discount_percentage, valid_until) VALUES (5, 'Student', 8.00, TO_DATE('2026-12-31', 'YYYY-MM-DD'));



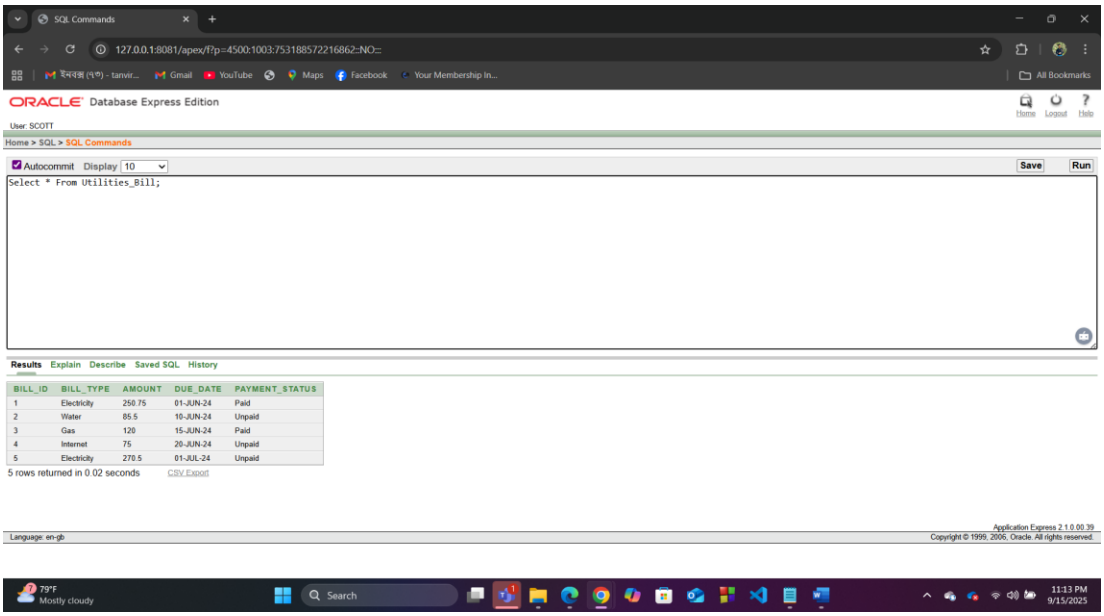
5.Customer Membership:

INSERT INTO Customer_Membership (customer_id, card_id, join_date) VALUES (1, 1, TO_DATE('2024-01-10', 'YYYY-MM-DD'));
INSERT INTO Customer_Membership (customer_id, card_id, join_date) VALUES (2, 2, TO_DATE('2024-02-15', 'YYYY-MM-DD'));
INSERT INTO Customer_Membership (customer_id, card_id, join_date) VALUES (3, 3, TO_DATE('2024-03-20', 'YYYY-MM-DD'));
INSERT INTO Customer_Membership (customer_id, card_id, join_date) VALUES (4, 4, TO_DATE('2024-04-25', 'YYYY-MM-DD'));
INSERT INTO Customer_Membership (customer_id, card_id, join_date) VALUES (5, 5, TO_DATE('2024-05-30', 'YYYY-MM-DD'));



6.Utilities Bill:

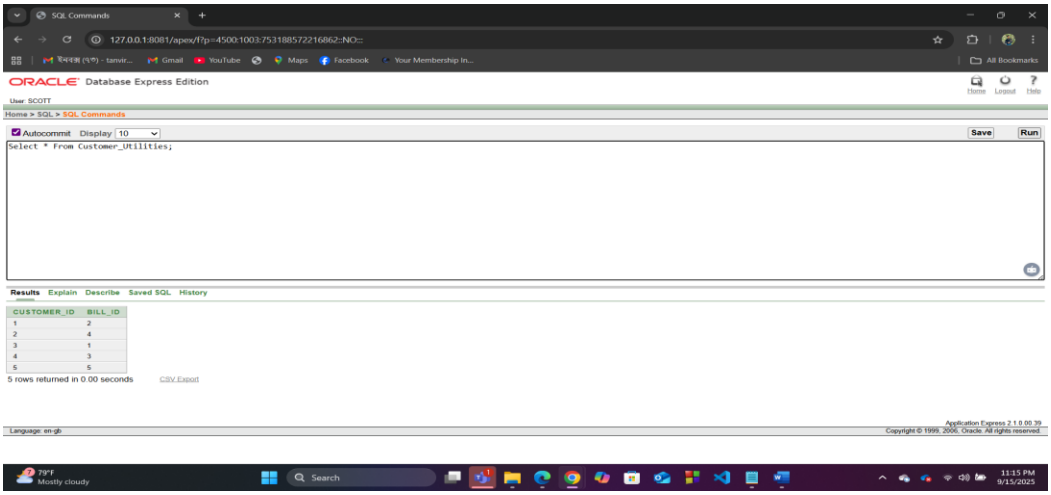
INSERT INTO Utilities_Bill (bill_id, bill_type, amount, due_date, payment_status) VALUES (1, 'Electricity', 250.75, TO_DATE('2024-06-01', 'YYYY-MM-DD'), 'Paid');
INSERT INTO Utilities_Bill (bill_id, bill_type, amount, due_date, payment_status) VALUES (2, 'Water', 85.50, TO_DATE('2024-06-10', 'YYYY-MM-DD'), 'Unpaid');
INSERT INTO Utilities_Bill (bill_id, bill_type, amount, due_date, payment_status) VALUES (3, 'Gas', 120.00, TO_DATE('2024-06-15', 'YYYY-MM-DD'), 'Paid');
INSERT INTO Utilities_Bill (bill_id, bill_type, amount, due_date, payment_status) VALUES (4, 'Internet', 75.00, TO_DATE('2024-06-20', 'YYYY-MM-DD'), 'Unpaid');
INSERT INTO Utilities_Bill (bill_id, bill_type, amount, due_date, payment_status) VALUES (5, 'Electricity', 270.50, TO_DATE('2024-07-01', 'YYYY-MM-DD'), 'Unpaid');



7.Customer_Utilities:

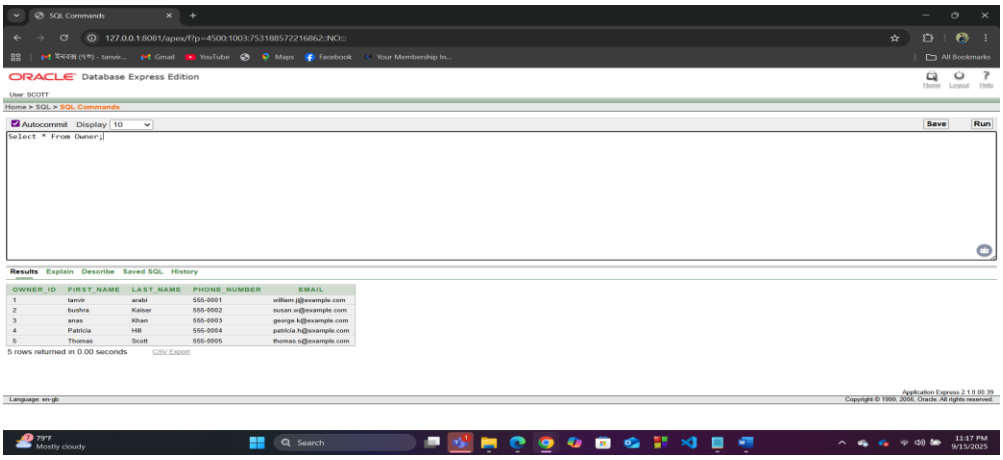
INSERT INTO Customer_Utilities (customer_id, bill_id) VALUES (1, 2);

INSERT INTO Customer_Utilities (customer_id, bill_id) VALUES (2, 4);
INSERT INTO Customer_Utilities (customer_id, bill_id) VALUES (3, 1);
INSERT INTO Customer_Utilities (customer_id, bill_id) VALUES (4, 3);
INSERT INTO Customer_Utilities (customer_id, bill_id) VALUES (5, 5);



8.Owner:

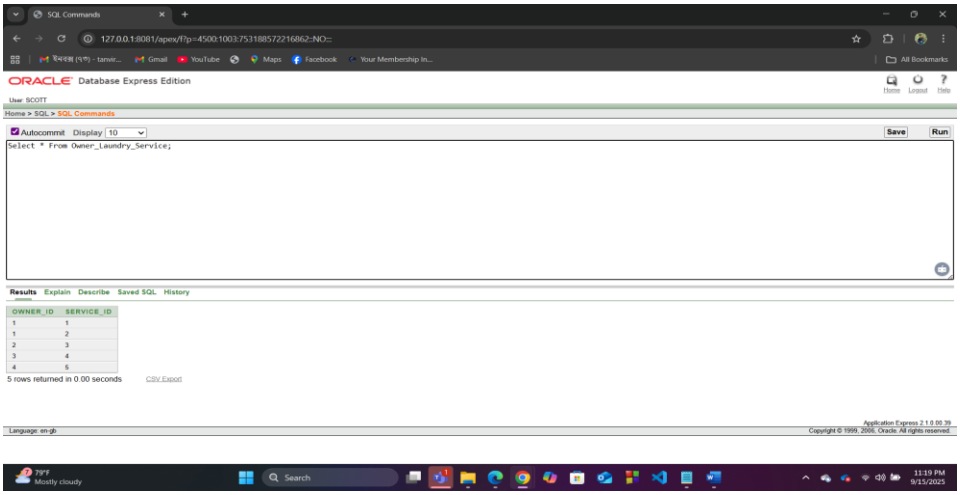
INSERT INTO Owner (owner_id, first_name, last_name, phone_number, email) VALUES (1, 'William', 'Jackson', '555-0001', 'william.j@example.com');
INSERT INTO Owner (owner_id, first_name, last_name, phone_number, email) VALUES (2, 'Susan', 'Wright', '555-0002', 'susan.w@example.com');
INSERT INTO Owner (owner_id, first_name, last_name, phone_number, email) VALUES (3, 'George', 'King', '555-0003', 'george.k@example.com');
INSERT INTO Owner (owner_id, first_name, last_name, phone_number, email) VALUES (4, 'Patricia', 'Hill', '555-0004', 'patricia.h@example.com');
INSERT INTO Owner (owner_id, first_name, last_name, phone_number, email) VALUES (5, 'Thomas', 'Scott', '555-0005', 'thomas.s@example.com');



9.Owner Laundry Service :

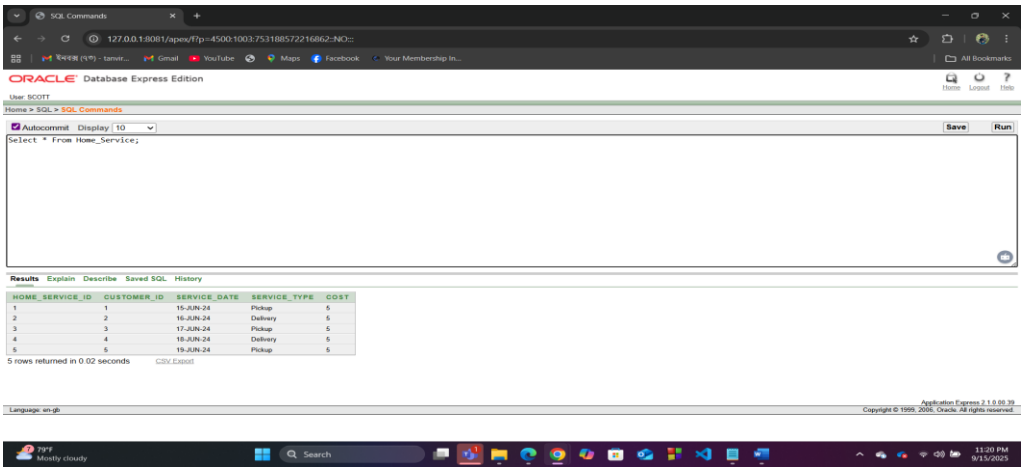
INSERT INTO Owner_Laundry_Service (owner_id, service_id) VALUES (1, 1);
INSERT INTO Owner_Laundry_Service (owner_id, service_id) VALUES (1, 2);

```
INSERT INTO Owner_Laundry_Service (owner_id, service_id) VALUES (2, 3);
INSERT INTO Owner_Laundry_Service (owner_id, service_id) VALUES (3, 4);
INSERT INTO Owner_Laundry_Service (owner_id, service_id) VALUES (4, 5);
```



10.Home Service:

```
INSERT INTO Home_Service (home_service_id, customer_id, service_date, service_type, cost)
VALUES (1, 1, TO_DATE('2024-06-15', 'YYYY-MM-DD'), 'Pickup', 5.00);
INSERT INTO Home_Service (home_service_id, customer_id, service_date, service_type, cost)
VALUES (2, 2, TO_DATE('2024-06-16', 'YYYY-MM-DD'), 'Delivery', 5.00);
INSERT INTO Home_Service (home_service_id, customer_id, service_date, service_type, cost)
VALUES (3, 3, TO_DATE('2024-06-17', 'YYYY-MM-DD'), 'Pickup', 5.00);
INSERT INTO Home_Service (home_service_id, customer_id, service_date, service_type, cost)
VALUES (4, 4, TO_DATE('2024-06-18', 'YYYY-MM-DD'), 'Delivery', 5.00);
INSERT INTO Home_Service (home_service_id, customer_id, service_date, service_type, cost)
VALUES (5, 5, TO_DATE('2024-06-19', 'YYYY-MM-DD'), 'Pickup', 5.00);
```

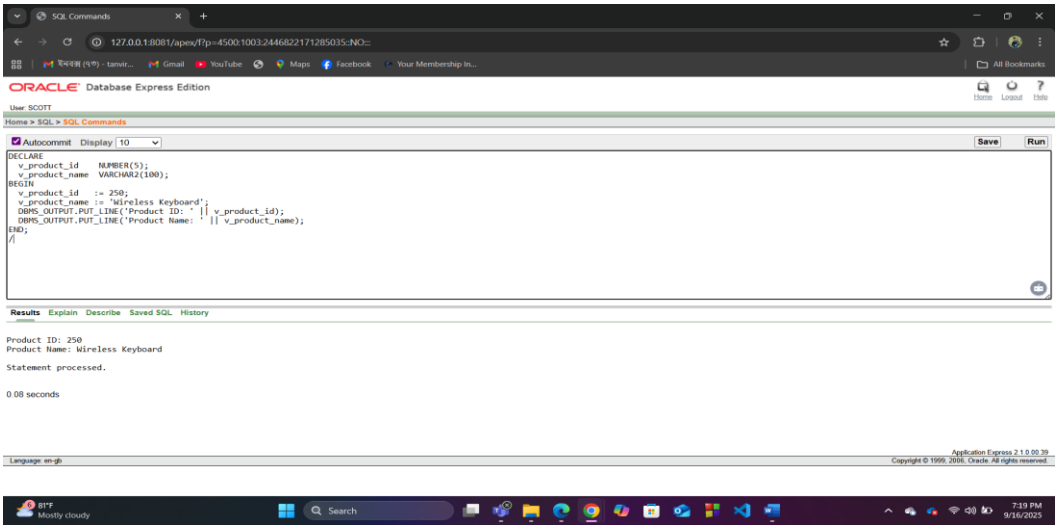


Missing basic PL/SQL query (Variables, operators, single-row-function, group-function)

Variables:

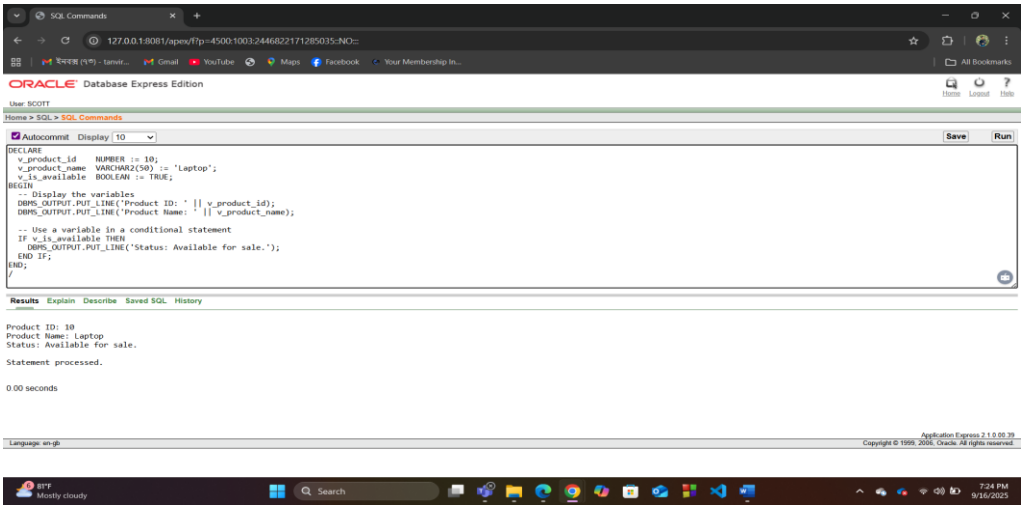
1. Names and data types of the two variables declared.

```
DECLARE
  v_product_id    NUMBER(5);
  v_product_name  VARCHAR2(100);
BEGIN
  v_product_id   := 250;
  v_product_name := 'Wireless Keyboard';
  DBMS_OUTPUT.PUT_LINE('Product ID: ' || v_product_id);
  DBMS_OUTPUT.PUT_LINE('Product Name: ' || v_product_name);
END;
/
```



2. In the provided PL/SQL block, Find value of v_product_id and data type of the v_product_name variable.

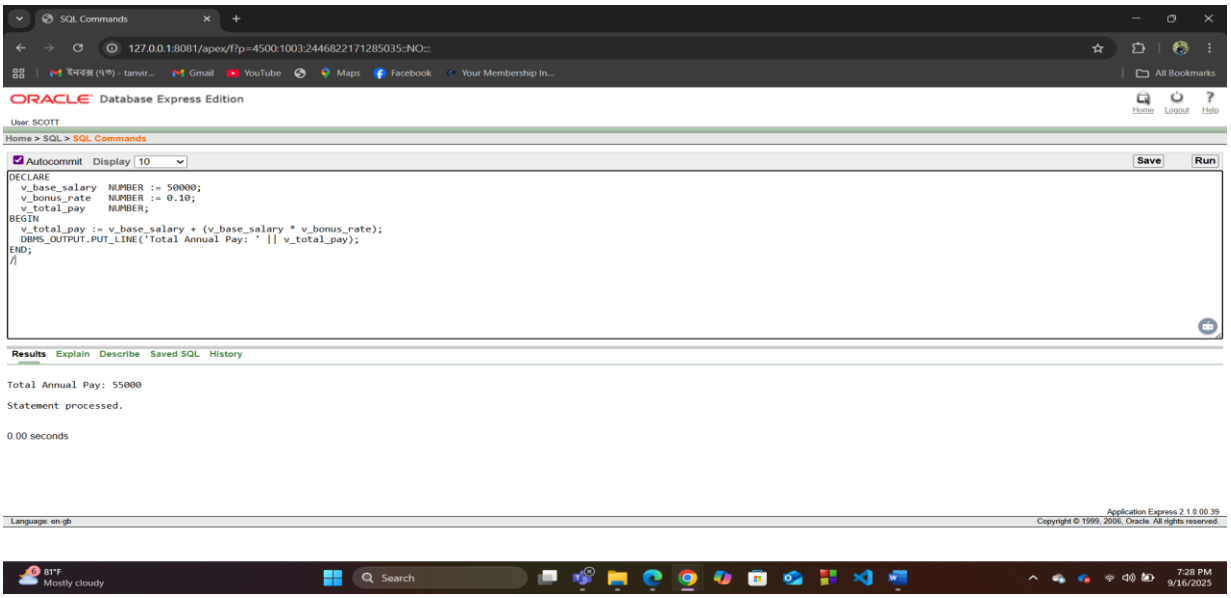
```
DECLARE
  v_employee_id   employees.employee_id%TYPE := 101;
  v_employee_name employees.first_name%TYPE;
BEGIN
  SELECT first_name
  INTO   v_employee_name
  FROM   employees
  WHERE  employee_id = v_employee_id;
  DBMS_OUTPUT.PUT_LINE('Employee Name: ' || v_employee_name);
END;
/
```



Operators:

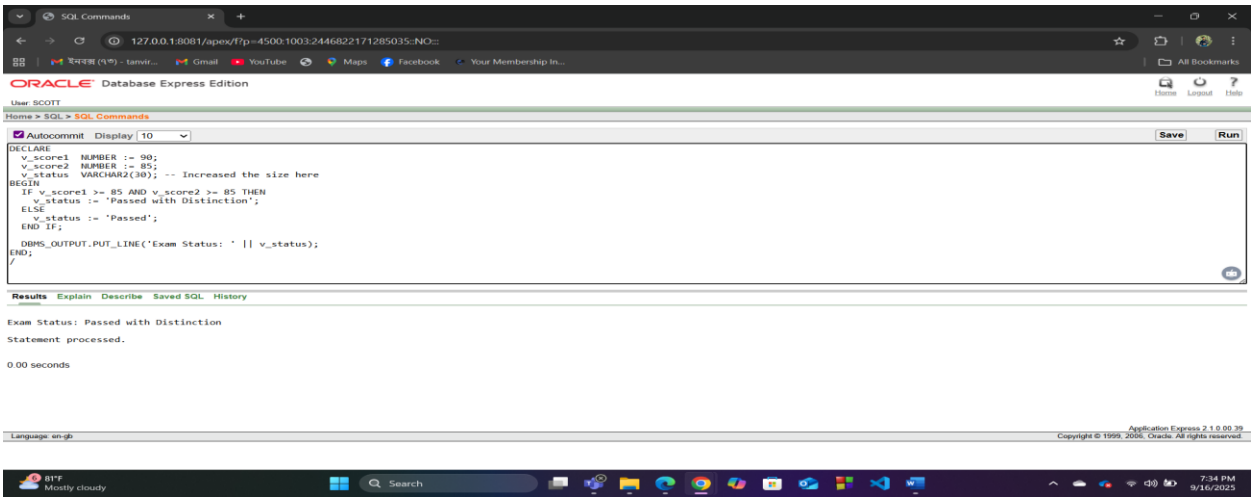
1. In the provided PL/SQL block, two Find the final value assigned to the v_total_pay variable after the calculation is complete.

```
DECLARE
  v_base_salary  NUMBER := 50000;
  v_bonus_rate   NUMBER := 0.10;
  v_total_pay    NUMBER;
BEGIN
  v_total_pay := v_base_salary + (v_base_salary * v_bonus_rate);
  DBMS_OUTPUT.PUT_LINE('Total Annual Pay: ' || v_total_pay);
END;
/
```



2. Write logical operator is used in the IF statement, and the final output.

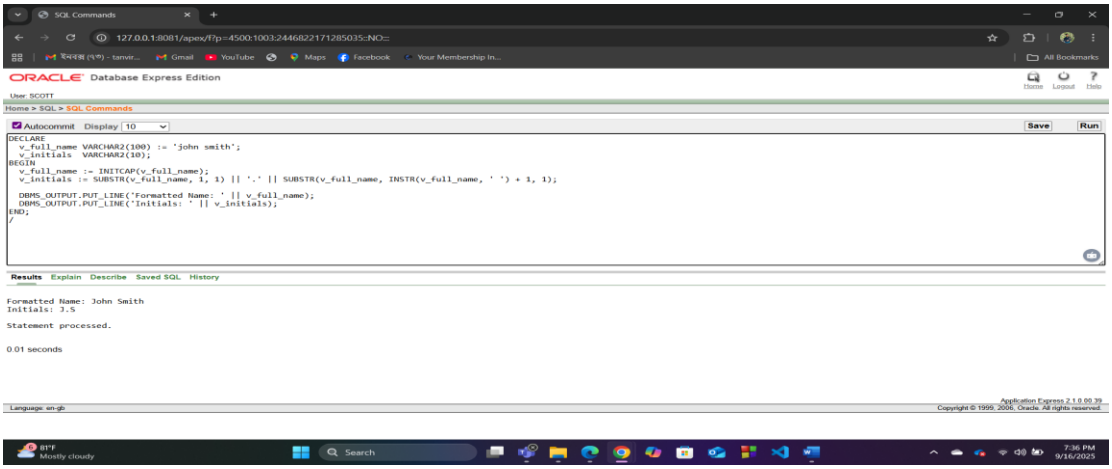
```
DECLARE
  v_score1  NUMBER := 90;
  v_score2  NUMBER := 85;
  v_status  VARCHAR2(20);
BEGIN
  IF v_score1 >= 85 AND v_score2 >= 85 THEN
    v_status := 'Passed with Distinction';
  ELSE
    v_status := 'Passed';
  END IF;
  DBMS_OUTPUT.PUT_LINE('Exam Status: ' || v_status);
END;
/
```



Single-row-function

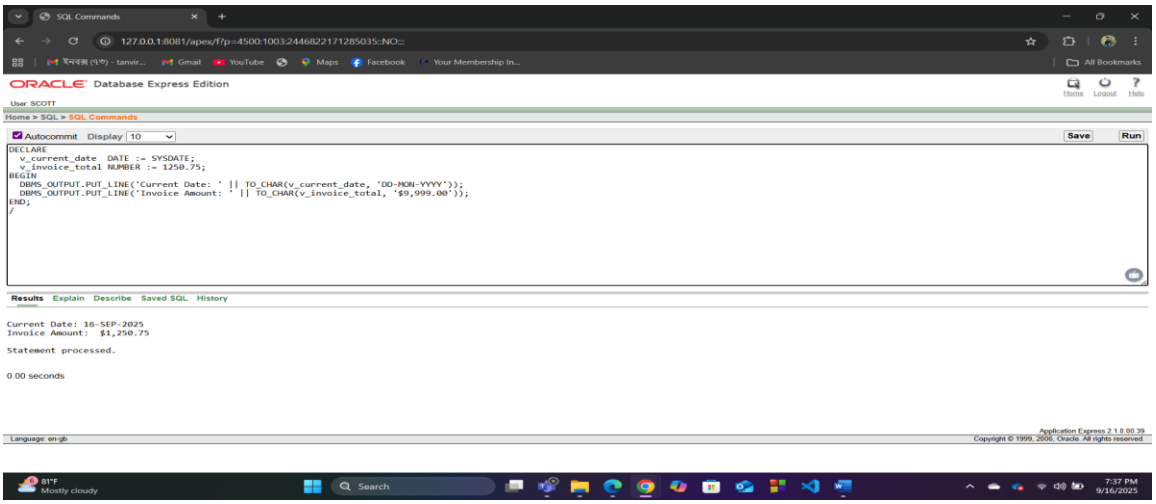
1. Find the value is stored in the v_initials variable after the block is executed.

```
DECLARE
  v_full_name VARCHAR2(100) := 'john smith';
  v_initials  VARCHAR2(10);
BEGIN
  v_full_name := INITCAP(v_full_name);
  v_initials := SUBSTR(v_full_name, 1, 1) || '.' || SUBSTR(v_full_name, INSTR(v_full_name, ' ')
+ 1, 1);
  DBMS_OUTPUT.PUT_LINE('Formatted Name: ' || v_full_name);
  DBMS_OUTPUT.PUT_LINE('Initials: ' || v_initials);
END;
/
```



2. Name of the function used to get the current date and display of v_invoice_total.

```
DECLARE
  v_current_date  DATE := SYSDATE;
  v_invoice_total NUMBER := 1250.75;
BEGIN
  DBMS_OUTPUT.PUT_LINE('Current Date: ' || TO_CHAR(v_current_date, 'DD-MON-YYYY'));
  DBMS_OUTPUT.PUT_LINE('Invoice Amount: ' || TO_CHAR(v_invoice_total, '$9,999.00'));
END;
/
```

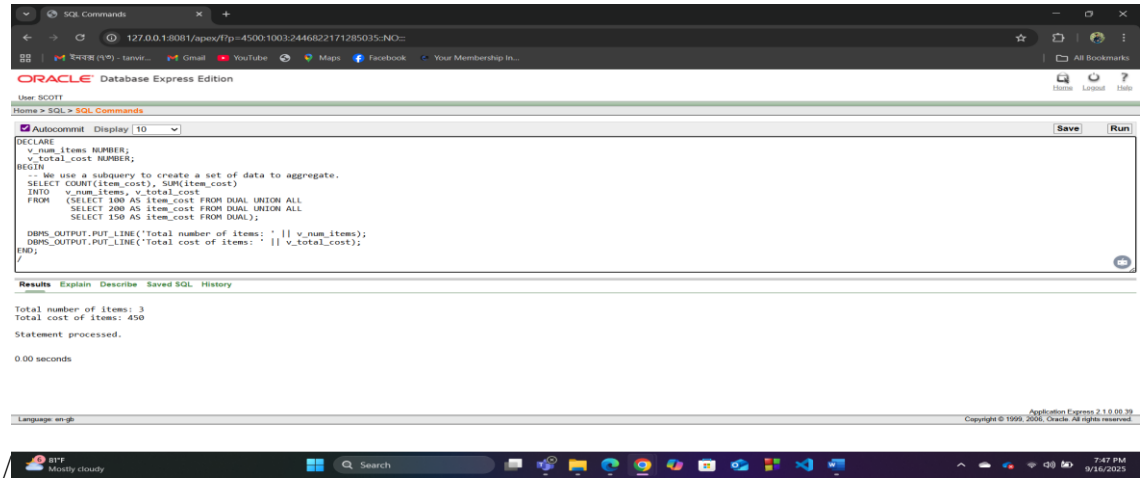


Group-function

1. Find the COUNT (item_cost) function and return a different value than the SUM(item_cost) function.

```
DECLARE
  v_num_items NUMBER;
  v_total_cost NUMBER;
BEGIN
```

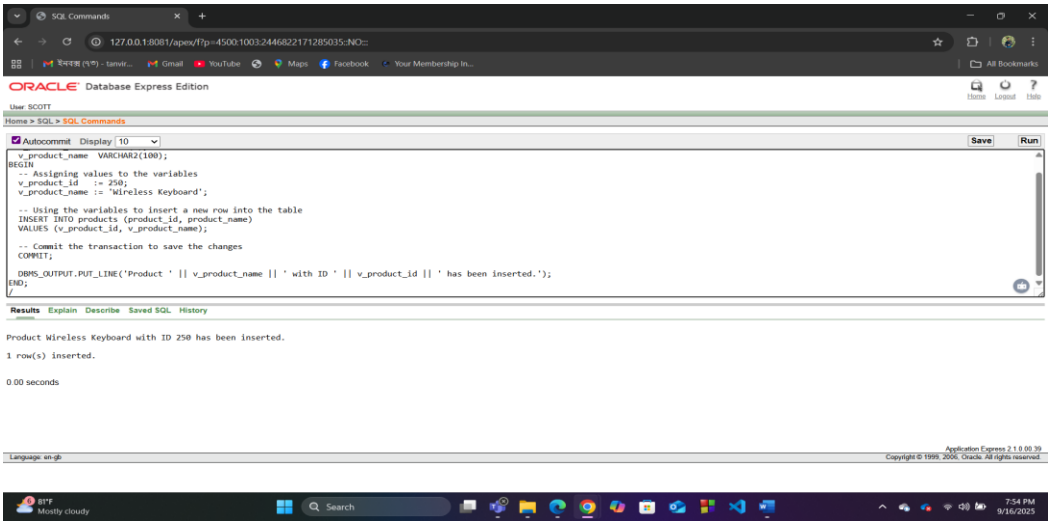
```
  SELECT COUNT(item_cost), SUM(item_cost)
  INTO   v_num_items, v_total_cost
  FROM   (SELECT 100 AS item_cost FROM DUAL UNION ALL
          SELECT 200 AS item_cost FROM DUAL UNION ALL
          SELECT 150 AS item_cost FROM DUAL);
   DBMS_OUTPUT.PUT_LINE('Total number of items: ' || v_num_items);
  DBMS_OUTPUT.PUT_LINE('Total cost of items: ' || v_total_cost);
END; /
```



/

2.In this PL/SQL block, Find the role of the v_product_id and v_product_name variables.

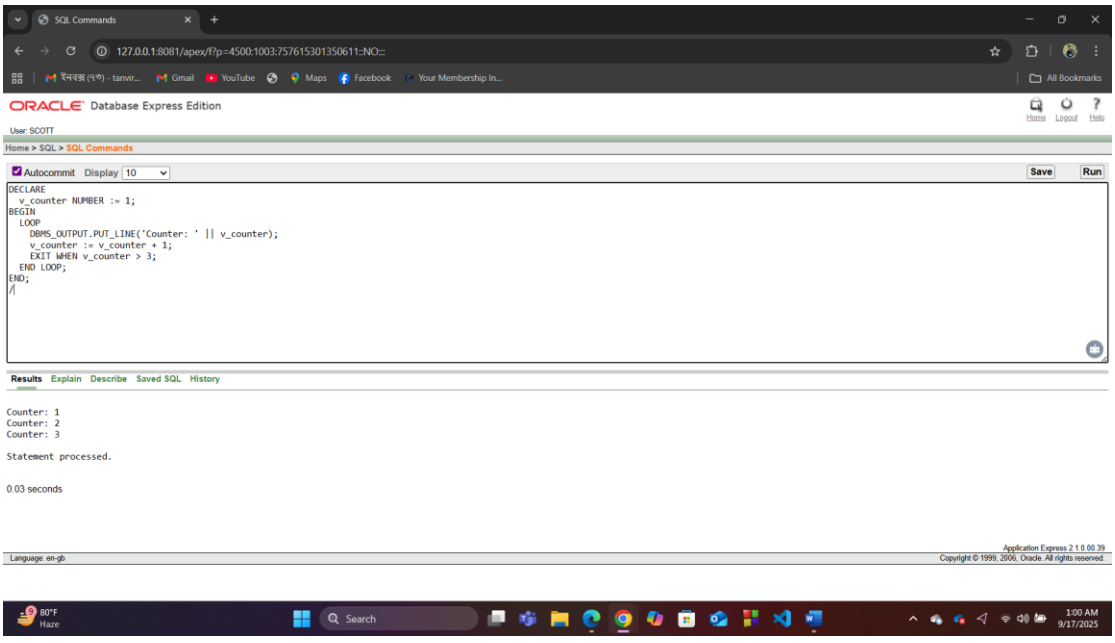
```
  DECLARE
  v_product_id    NUMBER(5);
  v_product_name  VARCHAR2(100);
 BEGIN
  v_product_id   := 250;
  v_product_name := 'Wireless Keyboard';
  INSERT INTO products (product_id, product_name)
  VALUES (v_product_id, v_product_name);
  COMMIT;
  DBMS_OUTPUT.PUT_LINE('Product ' || v_product_name || ' with ID ' || v_product_id || ' has
been inserted.');
END;
/
```



Loop

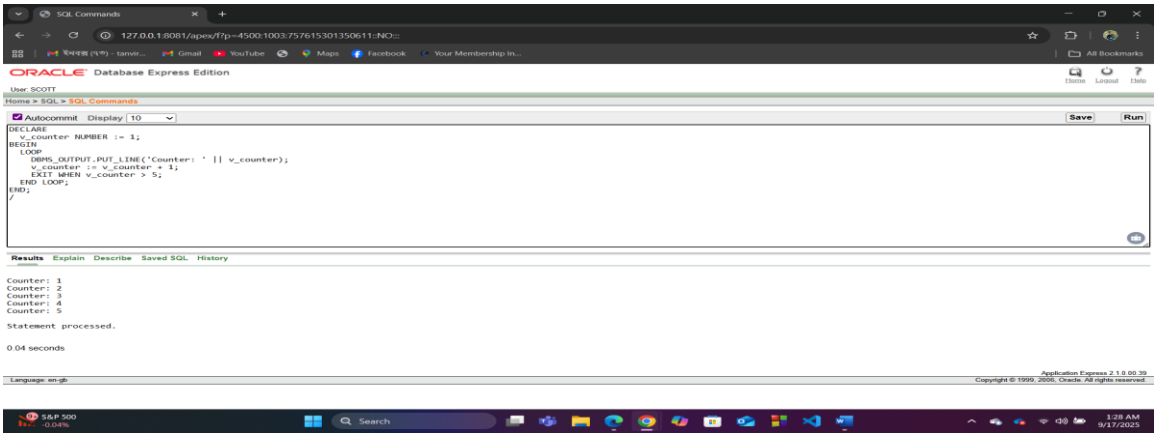
1. Write a PL/SQL block that uses a WHILE loop to print the numbers from 3 down to 1.

```
DECLARE
  v_counter NUMBER := 1;
BEGIN
  LOOP
    DBMS_OUTPUT.PUT_LINE('Counter: ' || v_counter);
    v_counter := v_counter + 1;
    EXIT WHEN v_counter > 3;
  END LOOP;
END;
/
```



2. Write a PL/SQL block that uses a WHILE loop to print the numbers from 5 down to 1.

```
DECLARE
  v_counter NUMBER := 1;
BEGIN
  LOOP
    DBMS_OUTPUT.PUT_LINE('Counter: ' || v_counter);
    v_counter := v_counter + 1;
    EXIT WHEN v_counter > 5;
  END LOOP;
END;
/
```

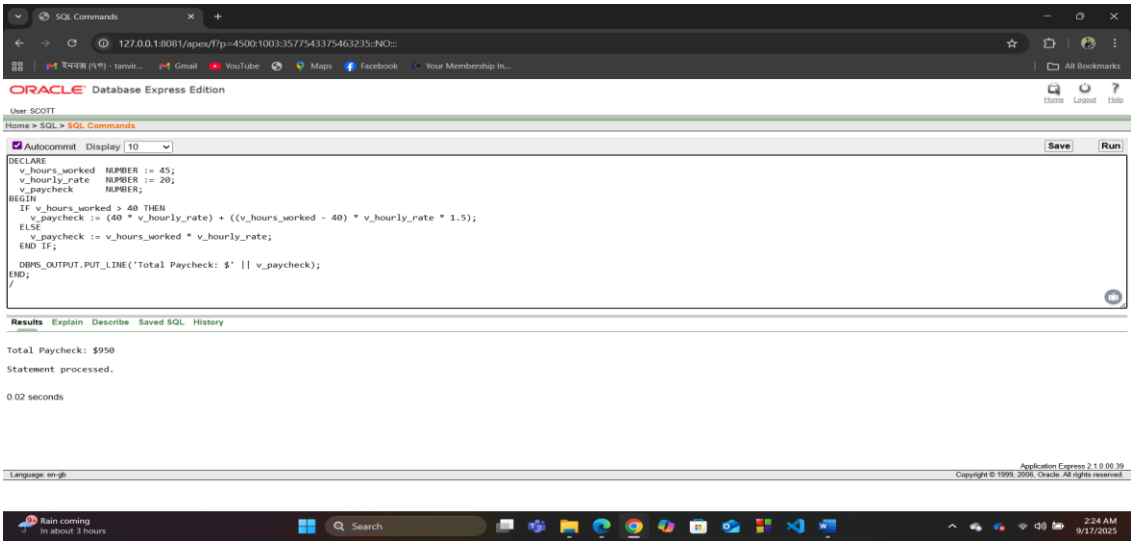


Conditional Statement

1. Write a PL/SQL block that iterates through the employees table, calculates a bonus for each employee based on their job, and updates a separate bonuses table. The bonus amount is 10% of the salary for IT_PROG jobs and 5% for all other jobs.

```
DECLARE
   CURSOR c_employees IS
    SELECT employee_id, job_id, salary
    FROM employees e
    WHERE e.department_id = (SELECT department_id FROM departments WHERE department_name = 'IT');
 v_bonus_amount NUMBER;
BEGIN
   FOR emp_rec IN (SELECT e.employee_id, e.job_id, e.salary
                FROM employees e
                JOIN departments d ON e.department_id = d.department_id
                WHERE d.department_name = 'Shipping')
  LOOP
    IF emp_rec.job_id = 'IT_PROG' THEN
      v_bonus_amount := emp_rec.salary * 0.10;
```

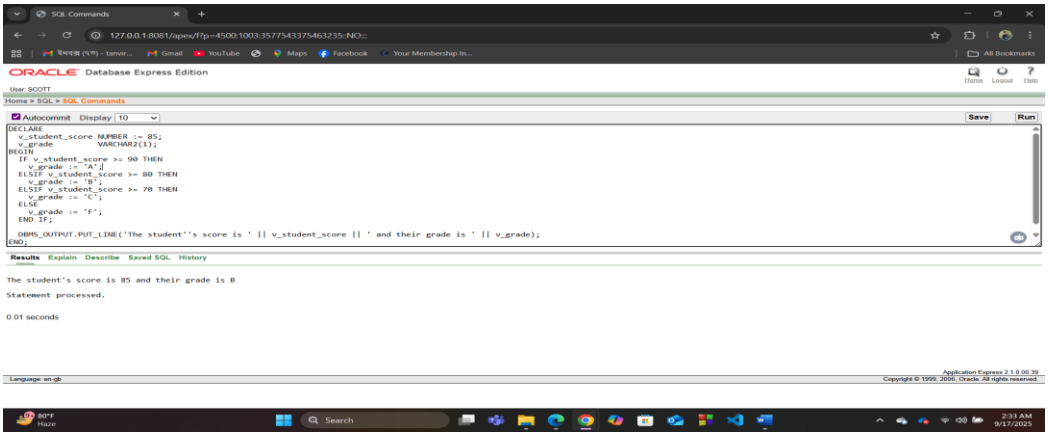
```
    ELSE
      v_bonus_amount := emp_rec.salary * 0.05;
    END IF;
    IF NOT EXISTS (SELECT 1 FROM bonuses WHERE employee_id = emp_rec.employee_id)
THEN
        INSERT INTO bonuses (employee_id, bonus_date, bonus_amount)
      VALUES (emp_rec.employee_id, SYSDATE, v_bonus_amount);
    END IF;
  END LOOP;
  COMMIT;
END;
/
```



2. Write a PL/SQL block to assign a letter grade to a student based on their score. The grading scale is: 'A' for scores 90-100, 'B' for 80-89, 'C' for 70-79, and 'F' for any score below 70.

```
DECLARE
  v_student_score NUMBER := 85;
  v_grade         VARCHAR2(1);
BEGIN
  IF v_student_score >= 90 THEN
    v_grade := 'A';
  ELSIF v_student_score >= 80 THEN
    v_grade := 'B';
  ELSIF v_student_score >= 70 THEN
    v_grade := 'C';
  ELSE
    v_grade := 'F';
```

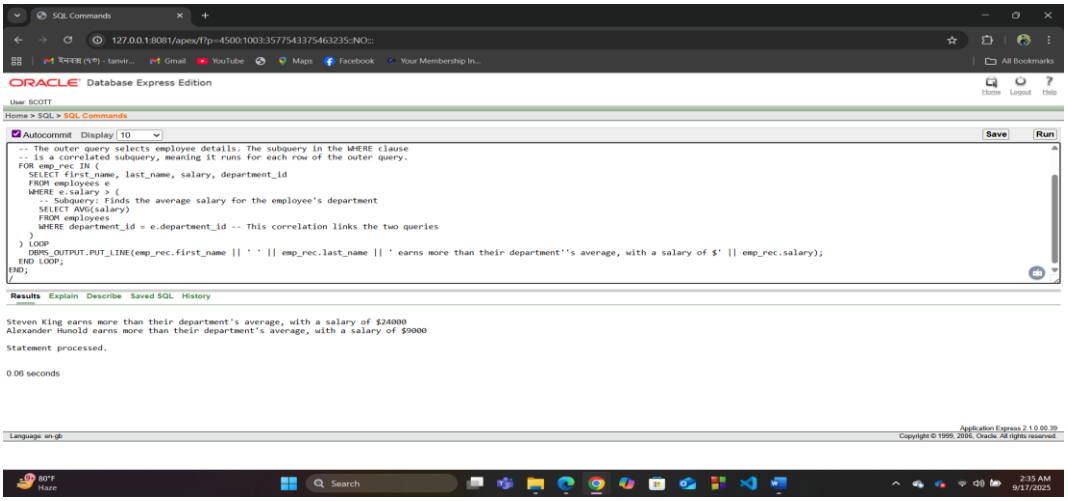
```
  END IF;
DBMS_OUTPUT.PUT_LINE('The student''s score is ' || v_student_score || ' and their grade is ' ||
v_grade);
END;
/
```



Subquery

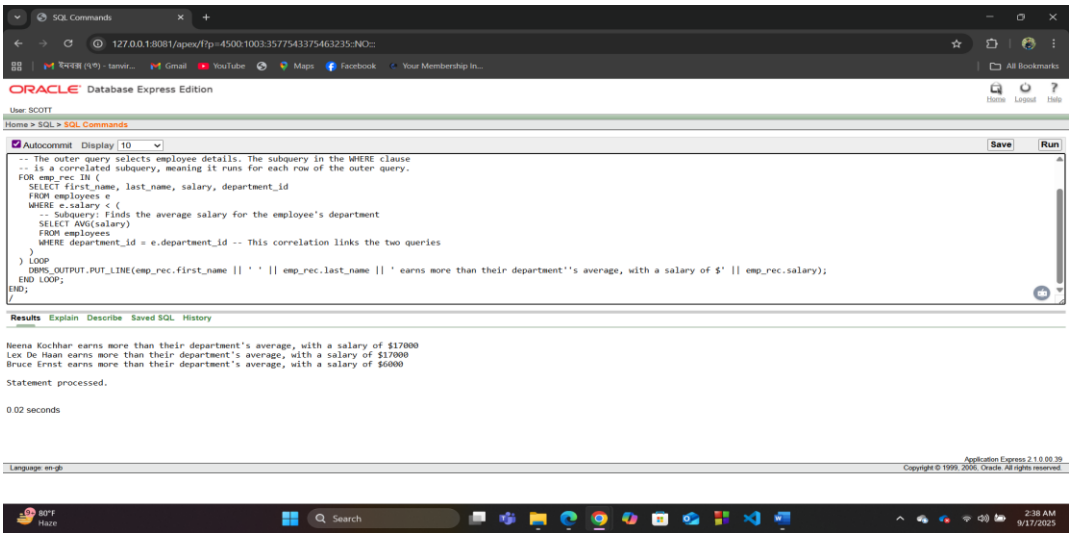
1.Write a PL/SQL block that lists the name and salary of every employee who earns more than the average salary of their own department

```
DECLARE
  v_employee_name VARCHAR2(100);
  v_employee_salary NUMBER;
BEGIN
    FOR emp_rec IN (
    SELECT first_name, last_name, salary, department_id
    FROM employees e
    WHERE e.salary > (
       SELECT AVG(salary)
      FROM employees
      WHERE department_id = e.department_id -- This correlation links the two queries
    )
  ) LOOP
    DBMS_OUTPUT.PUT_LINE(emp_rec.first_name || ' ' || emp_rec.last_name || ' earns more than
their department''s average, with a salary of $' || emp_rec.salary);
  END LOOP;
END;
/
```



2. Write a PL/SQL block to list the name and price of the most expensive product within each product category.

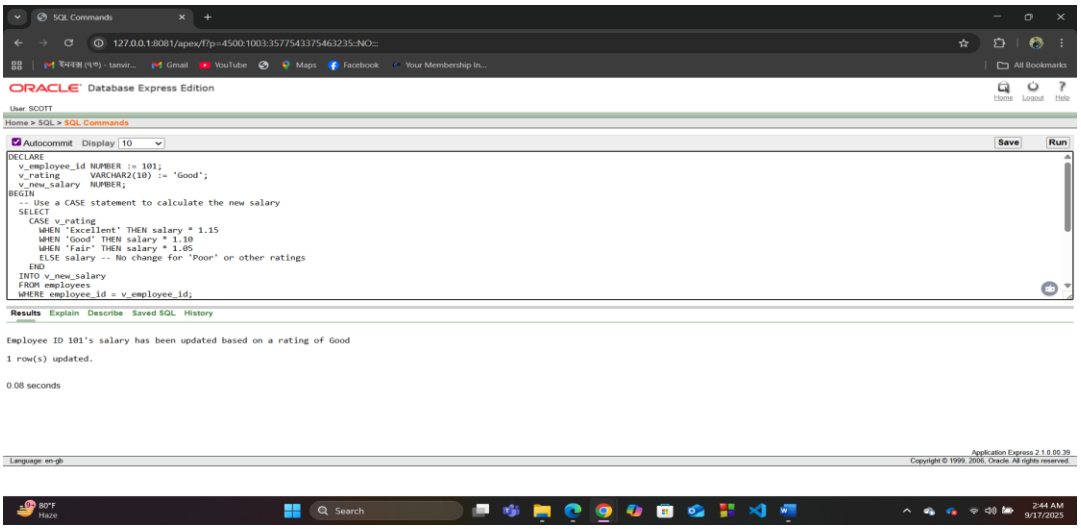
```
DECLARE
  v_employee_name VARCHAR2(100);
  v_employee_salary NUMBER;
BEGIN
    FOR emp_rec IN (
    SELECT first_name, last_name, salary, department_id
    FROM employees e
    WHERE e.salary < (

      SELECT AVG(salary)
      FROM employees
      WHERE department_id = e.department_id -- This correlation links the two queries
    )
  ) LOOP
    DBMS_OUTPUT.PUT_LINE(emp_rec.first_name || ' ' || emp_rec.last_name || ' earns more than their department''s average, with a salary of $' || emp_rec.salary);
  END LOOP;
END;
/
```



Joining

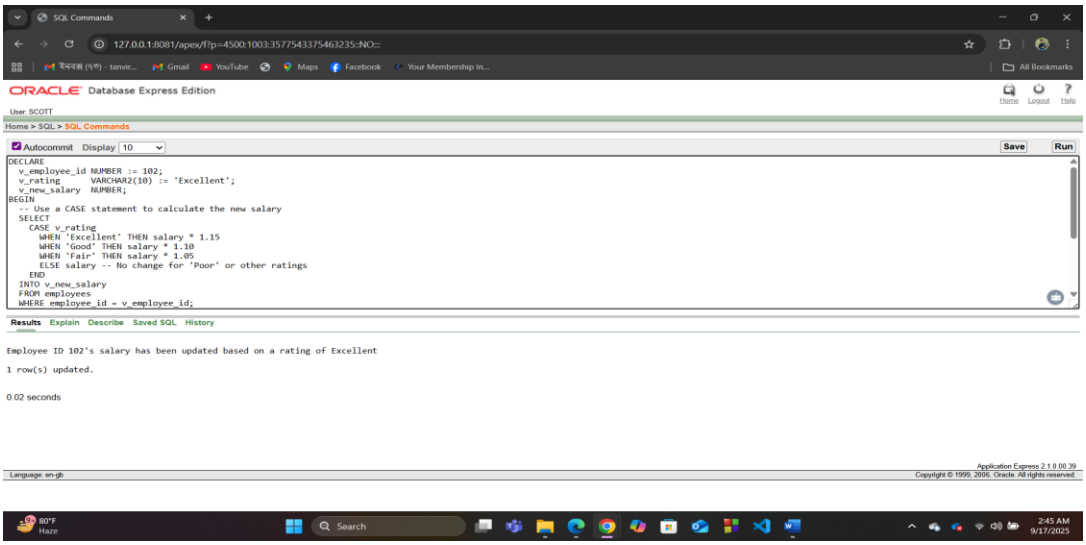
1. Write a PL/SQL block that uses a self-join to list every employee and the name of their direct manager. The output should include the employee's full name and their manager's full name.

```
 DECLARE
  v_employee_id NUMBER := 101;
  v_rating      VARCHAR2(10) := 'Good';
  v_new_salary  NUMBER;
BEGIN
  SELECT
    CASE v_rating
      WHEN 'Excellent' THEN salary * 1.15
      WHEN 'Good' THEN salary * 1.10
      WHEN 'Fair' THEN salary * 1.05
      ELSE salary -- No change for 'Poor' or other ratings
    END
  INTO v_new_salary
  FROM employees
  WHERE employee_id = v_employee_id;
  UPDATE employees
  SET salary = v_new_salary
  WHERE employee_id = v_employee_id;
 DBMS_OUTPUT.PUT_LINE('Employee ID ' || v_employee_id || '"s salary has been updated based on a rating of ' || v_rating);
COMMIT;
END;
/
```



2. Write a PL/SQL block that joins the employees and projects tables. The block should iterate through all employees and display their name and the name of the project they are assigned to. If an employee is not assigned a project, the output should indicate this.

```
DECLARE
  v_employee_id NUMBER := 102;
  v_rating      VARCHAR2(10) := 'Excellent';
  v_new_salary  NUMBER;

BEGIN
    SELECT
    CASE v_rating
      WHEN 'Excellent' THEN salary * 1.15
      WHEN 'Good' THEN salary * 1.10
      WHEN 'Fair' THEN salary * 1.05
      ELSE salary -- No change for 'Poor' or other ratings
    END
  INTO v_new_salary
  FROM employees
  WHERE employee_id = v_employee_id;

  UPDATE employees
  SET salary = v_new_salary
  WHERE employee_id = v_employee_id;
DBMS_OUTPUT.PUT_LINE('Employee ID ' || v_employee_id || '''s salary has been updated based on a rating of ' || v_rating);
COMMIT;
END;
/
```

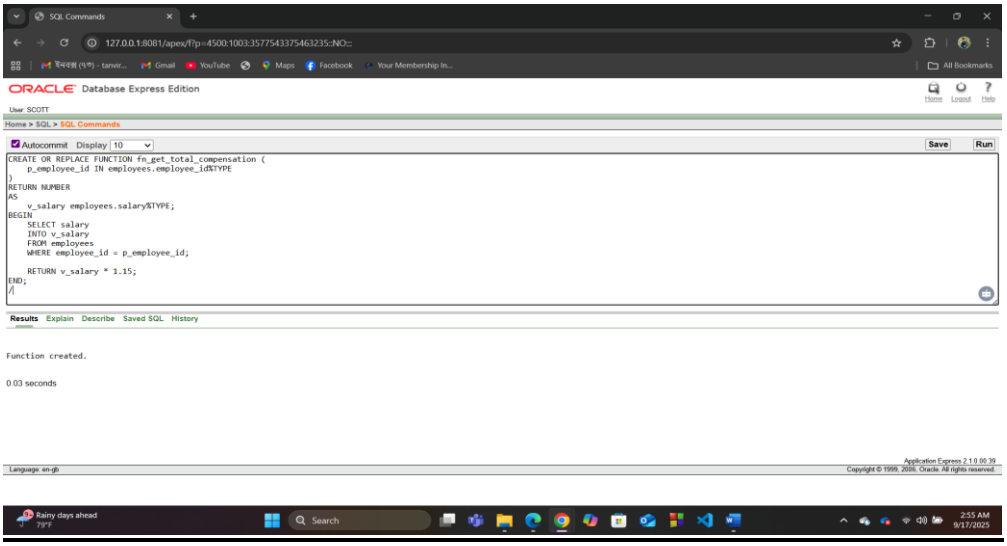


Advance PL/SQL(Missing Query)

Store function

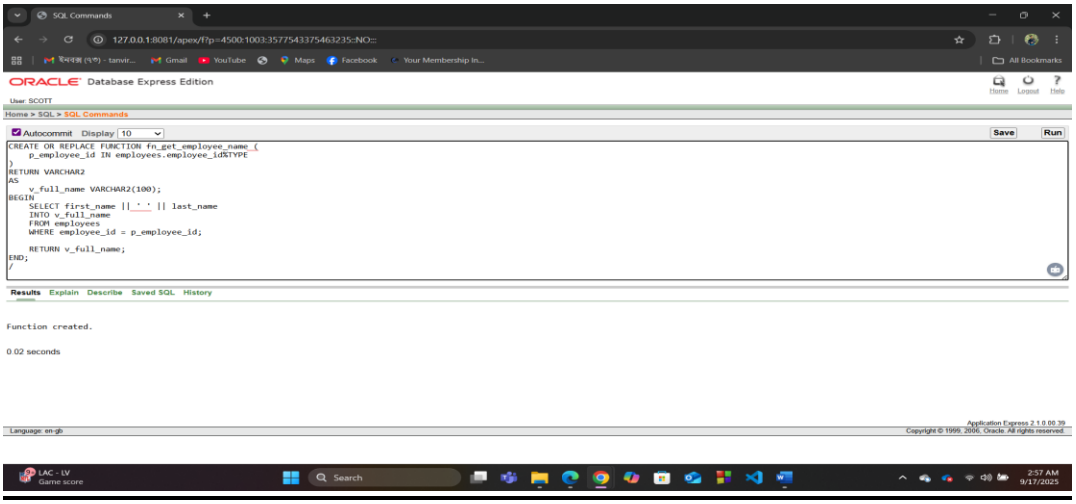
1. A company wants a function to calculate an employee's total compensation, which is their salary plus a 15% bonus. The function should accept the employee's ID and return the total amount.

```
CREATE OR REPLACE FUNCTION fn_get_total_compensation (
    p_employee_id IN employees.employee_id%TYPE
)
RETURN NUMBER
AS
    v_salary employees.salary%TYPE;
BEGIN
    SELECT salary
    INTO v_salary
    FROM employees
    WHERE employee_id = p_employee_id;
    RETURN v_salary * 1.15;
END;
/
```



2. Create a function that takes an employee's ID as input and returns their full name (first name and last name combined).

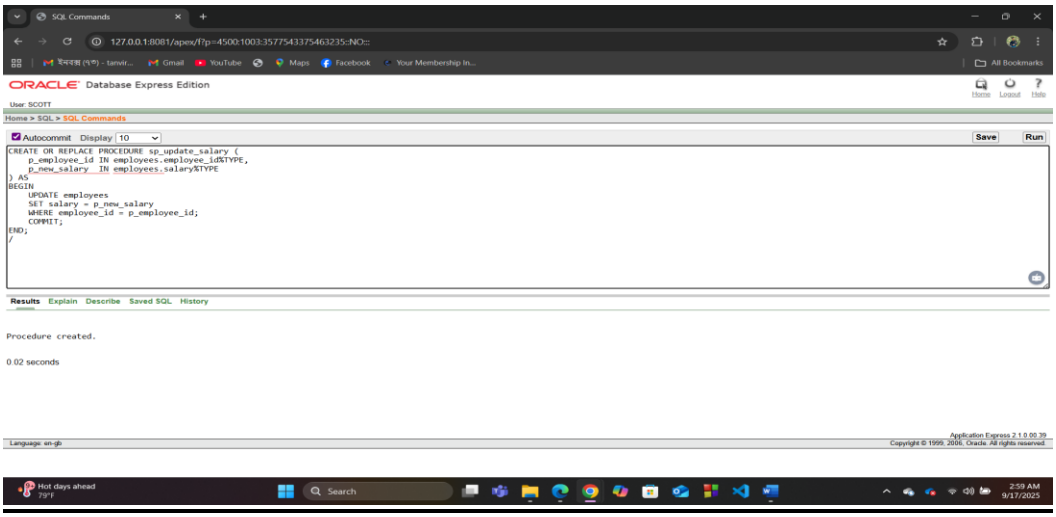
```
CREATE OR REPLACE FUNCTION fn_get_employee_name (
   p_employee_id IN employees.employee_id%TYPE
)
RETURN VARCHAR2
AS
   v_full_name VARCHAR2(100);
BEGIN
   SELECT first_name || ' ' || last_name
   INTO v_full_name
   FROM employees
   WHERE employee_id = p_employee_id;

   RETURN v_full_name;
END; /
```



Store procedure

1. Write a stored procedure named sp_update_salary that accepts an employee's ID and a new salary, then updates the employee's record with the new salary.

```
CREATE OR REPLACE PROCEDURE sp_update_salary (
    p_employee_id IN employees.employee_id%TYPE,
    p_new_salary  IN employees.salary%TYPE
) AS
BEGIN
    UPDATE employees
    SET salary = p_new_salary
    WHERE employee_id = p_employee_id;
    COMMIT;
END;
/
```



2. Write a procedure that accepts a name and displays a personalized greeting.

```
CREATE OR REPLACE PROCEDURE greet_person (
    p_name IN VARCHAR2
) AS
BEGIN
    DBMS_OUTPUT.PUT_LINE('Hello, ' || p_name || '! Welcome to the world of PL/SQL.');
END;
/
```

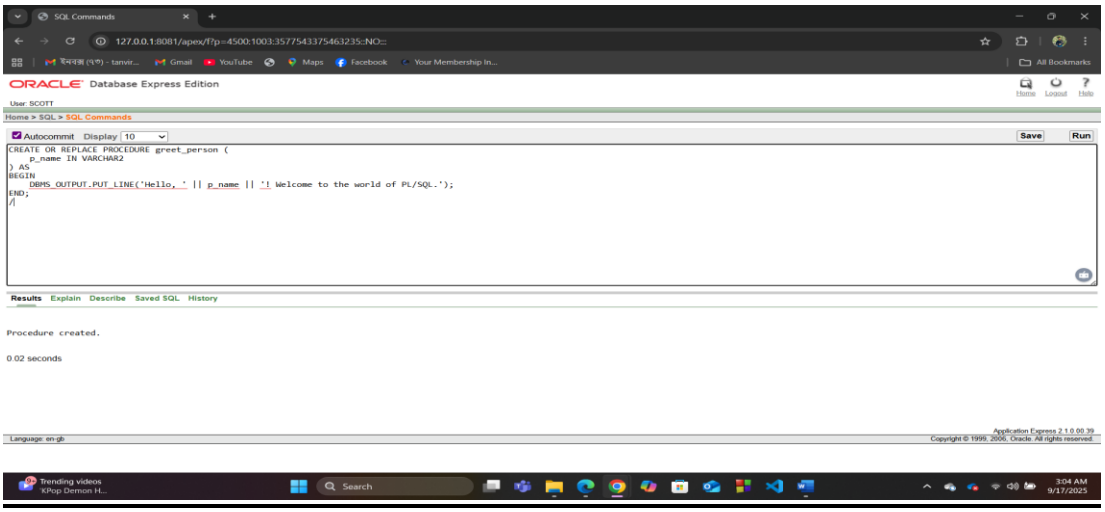
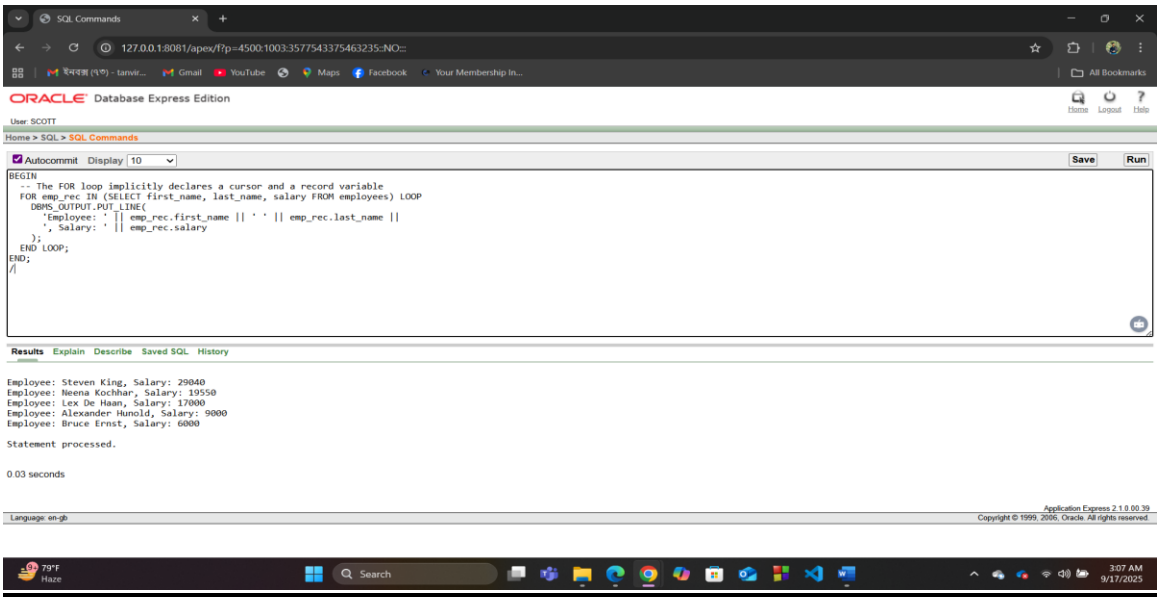


Table Based record

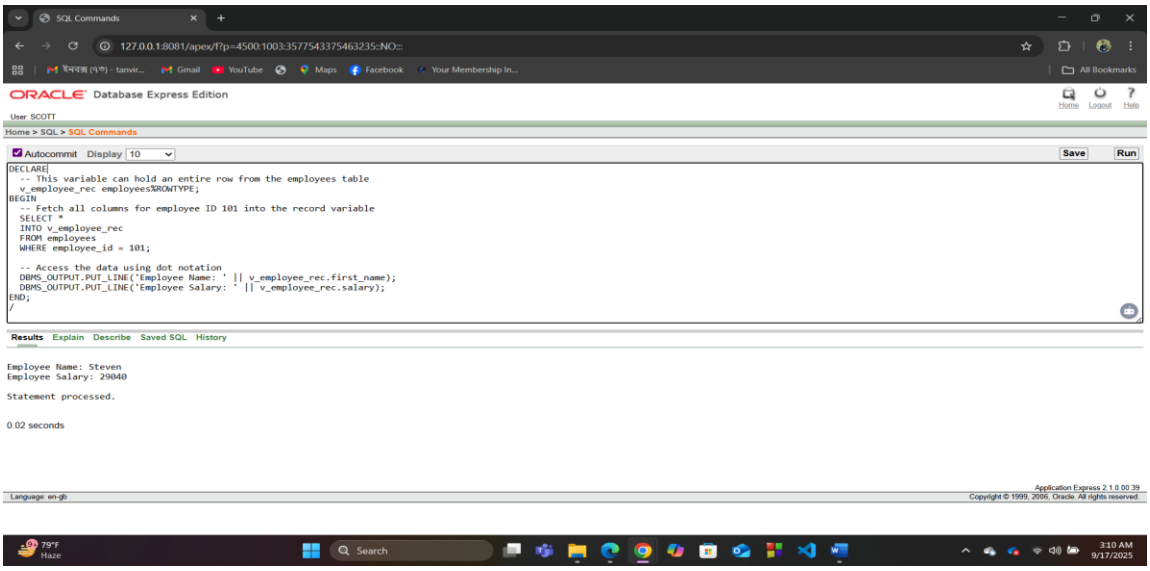
1. Write a PL/SQL block that uses an explicit cursor in a FOR loop to list the names and salaries of all employees.

```
BEGIN
  -- The FOR loop implicitly declares a cursor and a record variable
  FOR emp_rec IN (SELECT first_name, last_name, salary FROM employees) LOOP
    DBMS_OUTPUT.PUT_LINE(
      'Employee: ' || emp_rec.first_name || ' ' || emp_rec.last_name ||
      ', Salary: ' || emp_rec.salary
    );
  END LOOP;
END;
/
```



2. Write a PL/SQL block that retrieves all the data for one employee and stores it in a single record variable, then displays some of the information.

```
DECLARE
   v_employee_rec employees%ROWTYPE;
BEGIN
  SELECT *
  INTO v_employee_rec
  FROM employees
  WHERE employee_id = 101;
  DBMS_OUTPUT.PUT_LINE('Employee Name: ' || v_employee_rec.first_name);
  DBMS_OUTPUT.PUT_LINE('Employee Salary: ' || v_employee_rec.salary);
END;
/
```

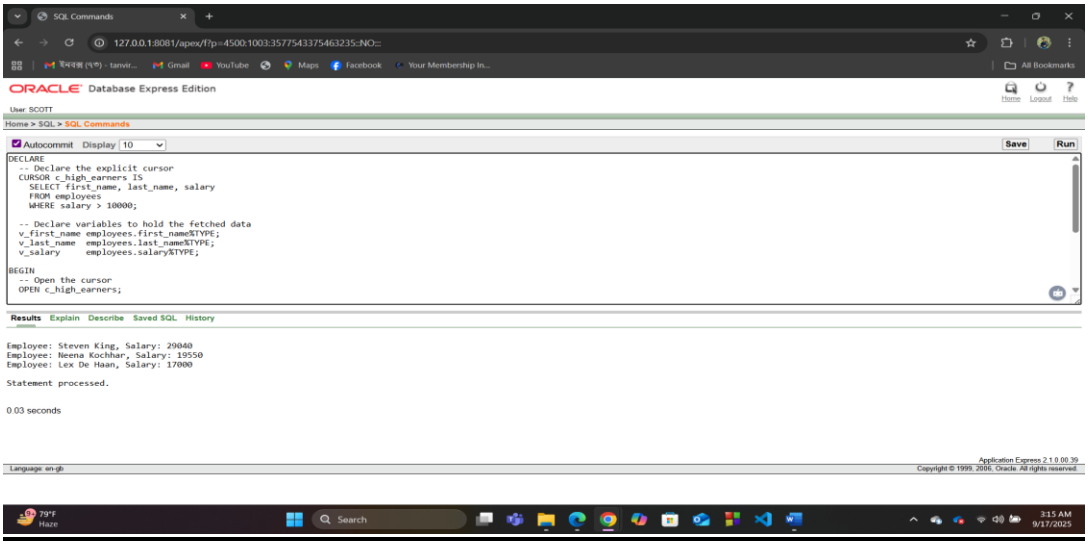


Explicit cursor

1. Write a PL/SQL block that uses an explicit cursor to display the names and salaries of employees who earn more than $10,000.

```
DECLARE
  CURSOR c_high_earners IS
    SELECT first_name, last_name, salary
    FROM employees
    WHERE salary > 10000;
 v_first_name employees.first_name%TYPE;
  v_last_name  employees.last_name%TYPE;
  v_salary     employees.salary%TYPE;
BEGIN
```

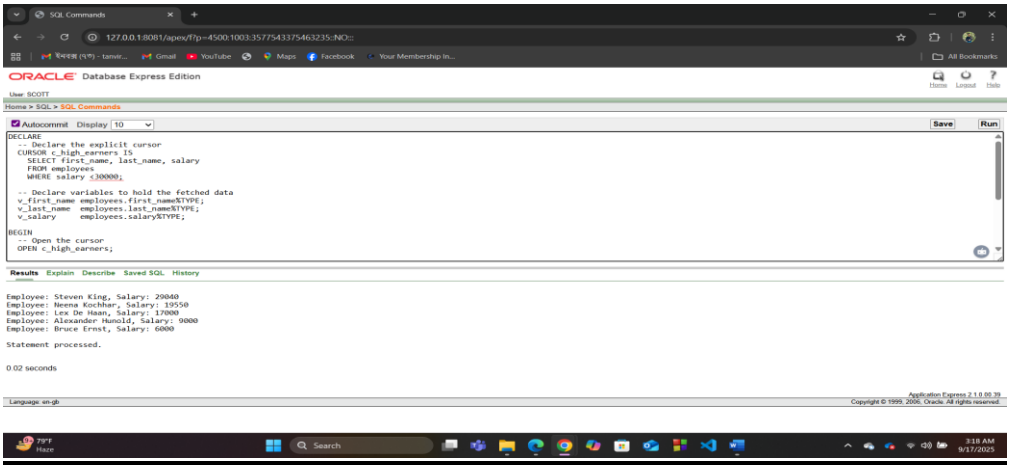
```
 OPEN c_high_earners;
 LOOP
   FETCH c_high_earners INTO v_first_name, v_last_name, v_salary;
   EXIT WHEN c_high_earners%NOTFOUND;
 DBMS_OUTPUT.PUT_LINE('Employee: ' || v_first_name || ' ' || v_last_name || ', Salary: ' ||
v_salary);
  END LOOP;
  CLOSE c_high_earners;
END;
/
```



2. Write a PL/SQL block that uses an explicit cursor to display the names and salaries of employees who earn less than $30,000

```
DECLARE
  CURSOR c_high_earners IS
    SELECT first_name, last_name, salary
    FROM employees
    WHERE salary <30000;
  v_first_name employees.first_name%TYPE;
  v_last_name  employees.last_name%TYPE;
  v_salary     employees.salary%TYPE;
BEGIN
  OPEN c_high_earners;
  LOOP
    FETCH c_high_earners INTO v_first_name, v_last_name, v_salary;
    EXIT WHEN c_high_earners%NOTFOUND;
```

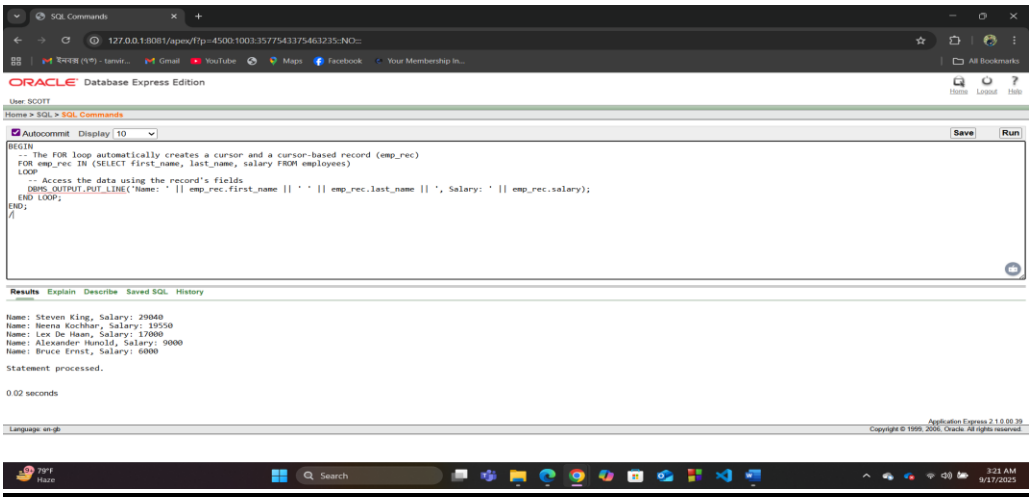
```
   DBMS_OUTPUT.PUT_LINE('Employee: ' || v_first_name || ' ' || v_last_name || ', Salary: ' ||
v_salary);
  END LOOP;
 CLOSE c_high_earners;
END;
/
```



Cursor based record

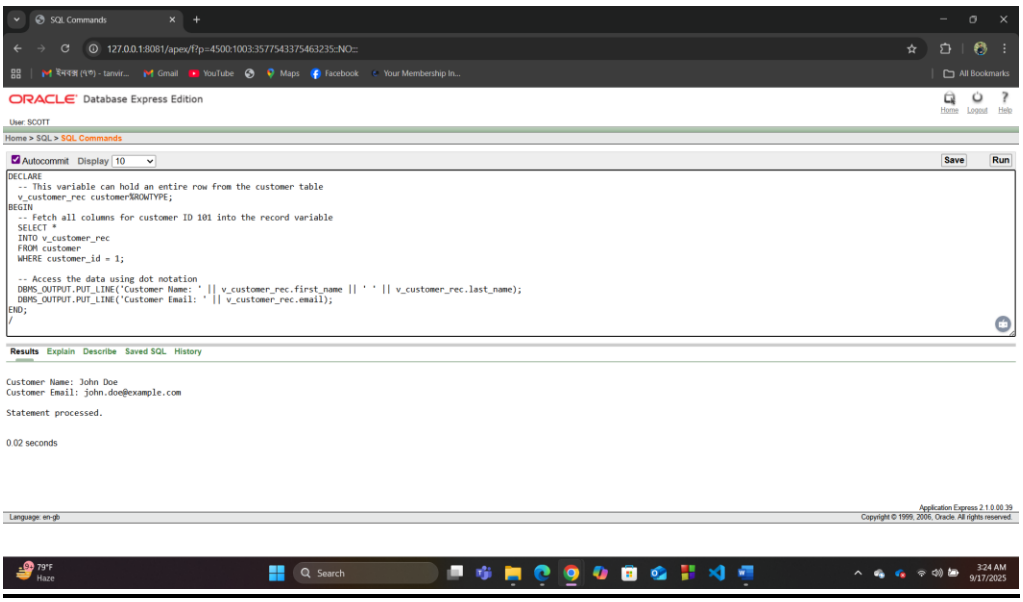
1. Write a PL/SQL block that uses a cursor FOR loop to display the names and salaries of all employees.

```
BEGIN
   FOR emp_rec IN (SELECT first_name, last_name, salary FROM employees)
  LOOP
   DBMS_OUTPUT.PUT_LINE('Name: ' || emp_rec.first_name || ' ' || emp_rec.last_name || ',
Salary: ' || emp_rec.salary);
  END LOOP;
END;
/
```



2. Write a PL/SQL block that retrieves all the data for a specific customer with customer_id 1 and stores it in a single record variable. Display the customer's name and email from the record.

```
DECLARE
   v_customer_rec customer%ROWTYPE;
BEGIN
  SELECT *
  INTO v_customer_rec
  FROM customer
  WHERE customer_id = 1;
   DBMS_OUTPUT.PUT_LINE('Customer Name: ' || v_customer_rec.first_name || ' ' || v_customer_rec.last_name);
  DBMS_OUTPUT.PUT_LINE('Customer Email: ' || v_customer_rec.email);
END;
/
```

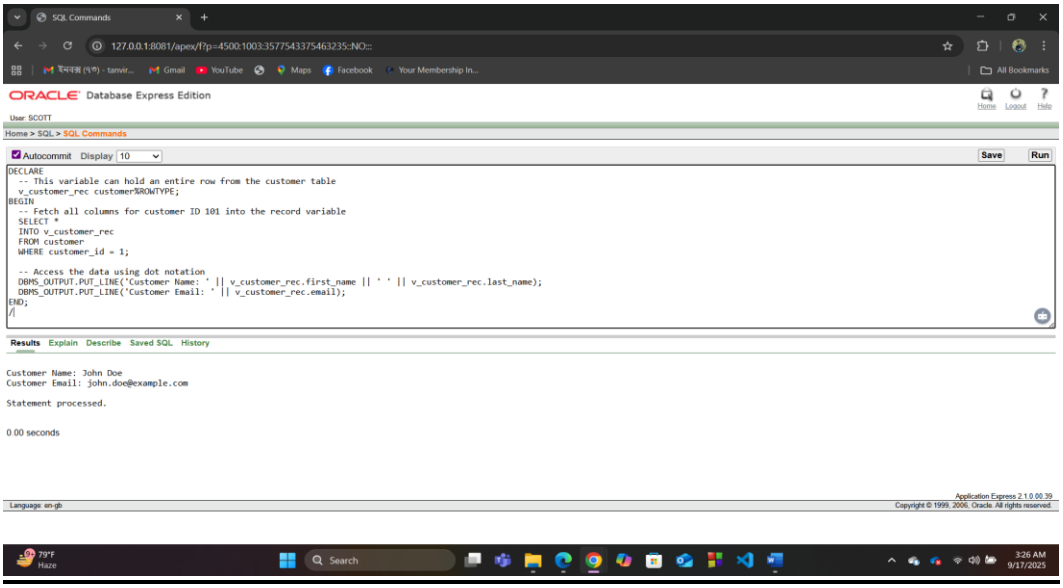


Row level trigger

1. Create a row-level trigger that logs a change in an employee's salary. The trigger should only fire when the salary column is updated. It should insert a new record into an audit_log table that includes the old salary, the new salary, the date of the change, and the user who made the change.

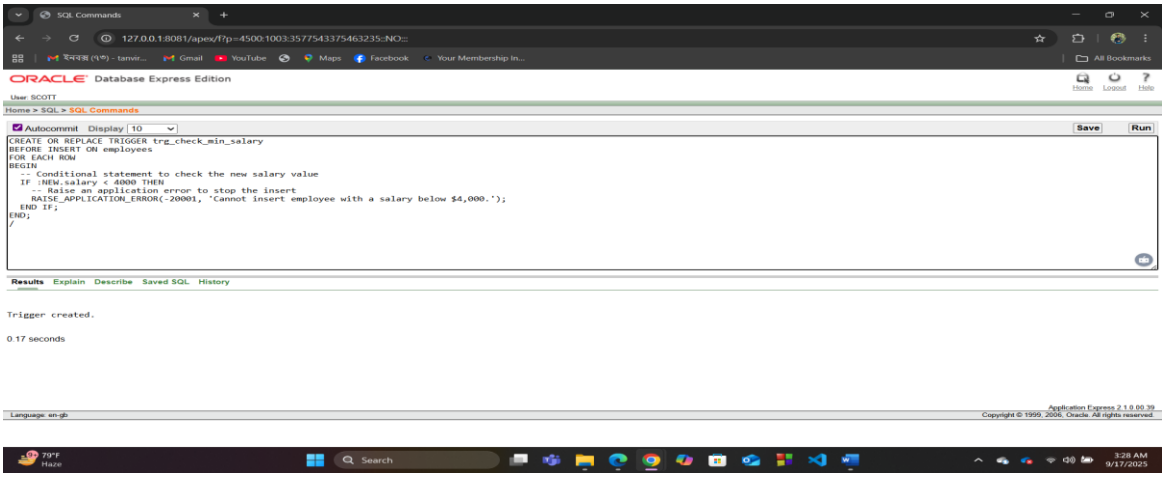
```
DECLARE
  v_customer_rec customer%ROWTYPE;
BEGIN
  SELECT *
  INTO v_customer_rec
  FROM customer
```

```
  WHERE customer_id = 1;
   DBMS_OUTPUT.PUT_LINE('Customer Name: ' || v_customer_rec.first_name || ' ' ||
v_customer_rec.last_name);
  DBMS_OUTPUT.PUT_LINE('Customer Email: ' || v_customer_rec.email);
END;
/
```



2. Create a row-level trigger named trg_check_min_salary that prevents the insertion of a new employee if their salary is below $4,000.

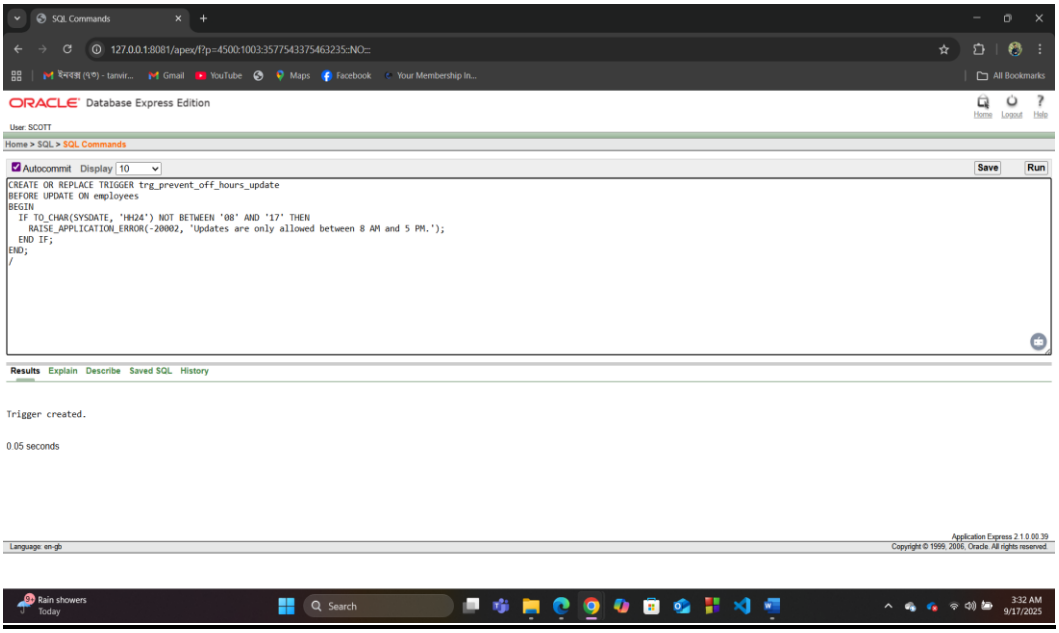
```
CREATE OR REPLACE TRIGGER trg_check_min_salary
BEFORE INSERT ON employees
FOR EACH ROW
BEGIN
  IF :NEW.salary < 4000 THEN
    RAISE_APPLICATION_ERROR(-20001, 'Cannot insert employee with a salary below
$4,000.');
  END IF;
END;
/
```



Statement level trigger

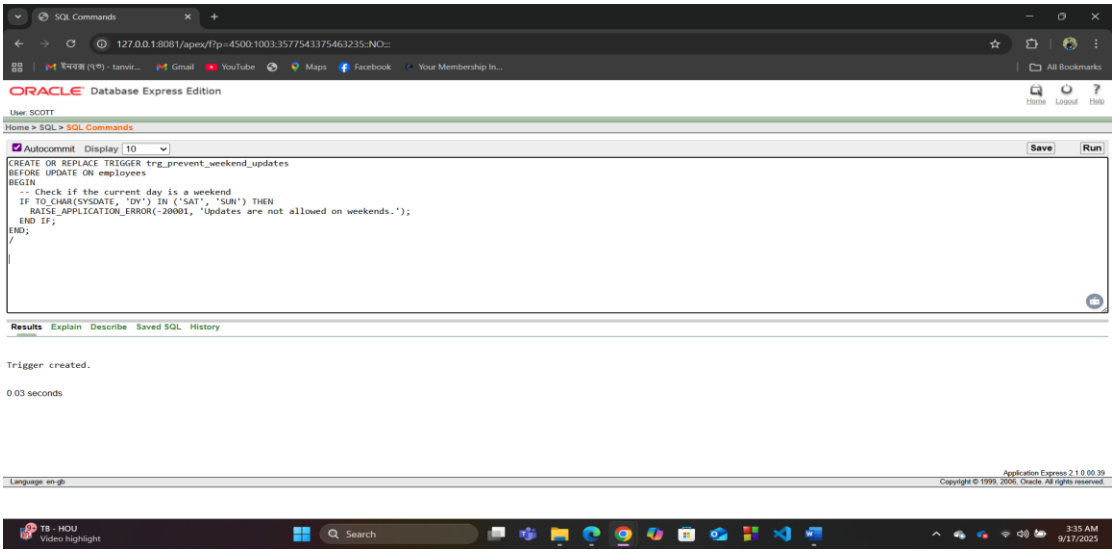
1. Create a statement-level trigger that prevents any UPDATE operation on the employees table outside of standard business hours (8 AM to 5 PM).

```
CREATE OR REPLACE TRIGGER trg_prevent_off_hours_update
BEFORE UPDATE ON employees
BEGIN
  IF TO_CHAR(SYSDATE, 'HH24') NOT BETWEEN '08' AND '17' THEN
    RAISE_APPLICATION_ERROR(-20002, 'Updates are only allowed between 8 AM and 5 PM.');
  END IF;
END;
/
```



2. Modify the statement-level trigger to prevent any UPDATE operation on the employees table on weekends.

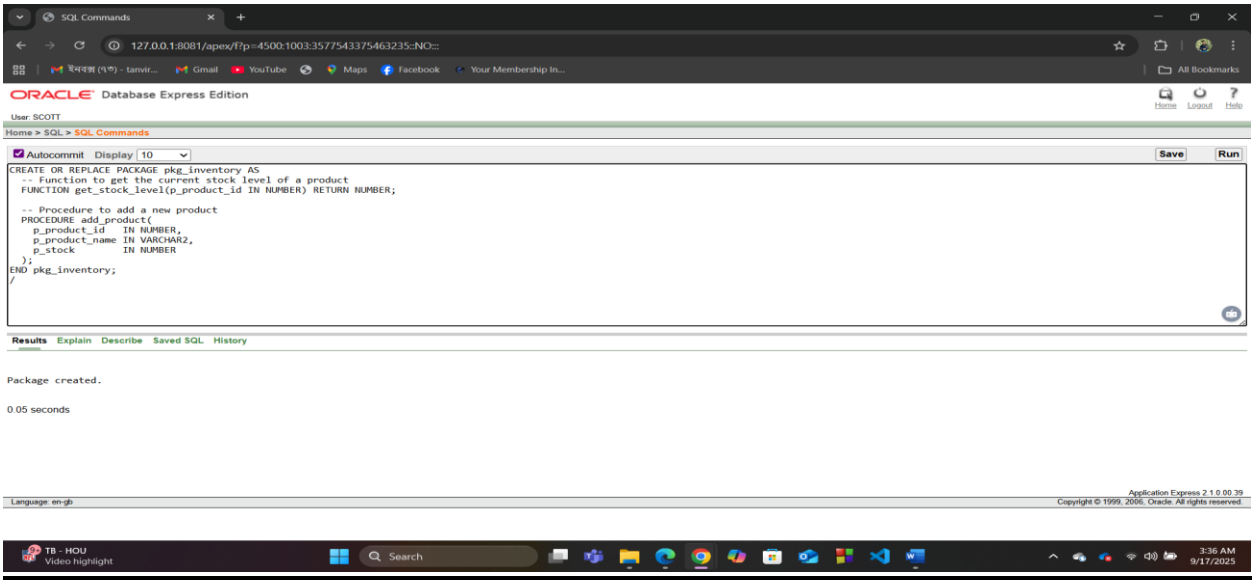
```
CREATE OR REPLACE TRIGGER trg_prevent_weekend_updates
BEFORE UPDATE ON employees
BEGIN
  IF TO_CHAR(SYSDATE, 'DY') IN ('SAT', 'SUN') THEN
    RAISE_APPLICATION_ERROR(-20001, 'Updates are not allowed on weekends.');
  END IF;
END;
/
```



Package

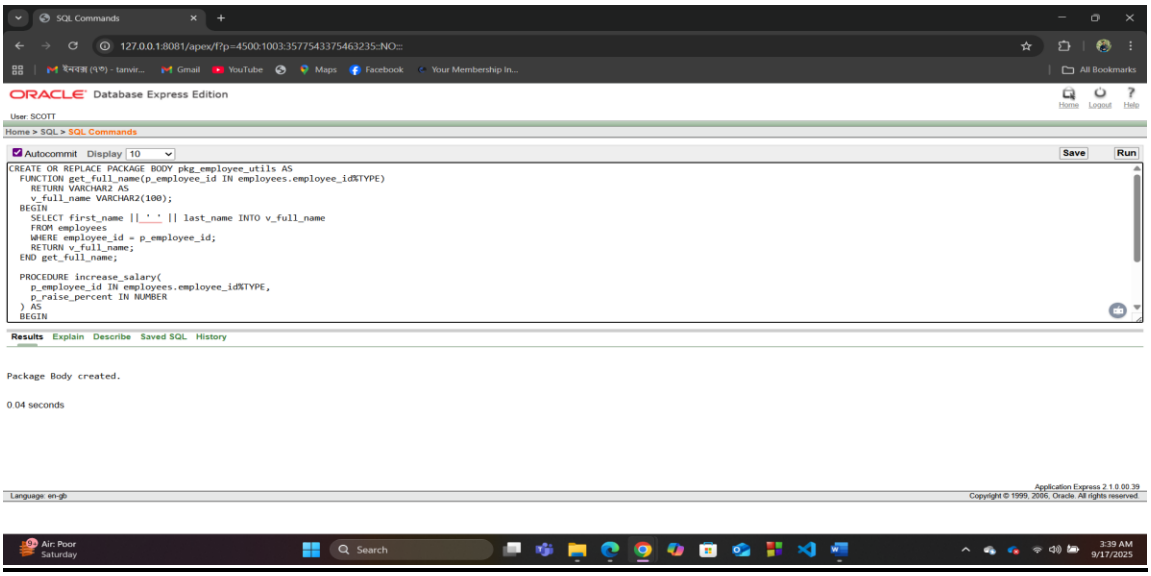
1.Create a package named pkg_inventory that contains a function to check a product's stock level and a procedure to add new products.

```
CREATE OR REPLACE PACKAGE pkg_inventory AS
  FUNCTION get_stock_level(p_product_id IN NUMBER) RETURN NUMBER;
  PROCEDURE add_product(
    p_product_id   IN NUMBER,
    p_product_name IN VARCHAR2,
    p_stock        IN NUMBER
  );
END pkg_inventory;
/
```



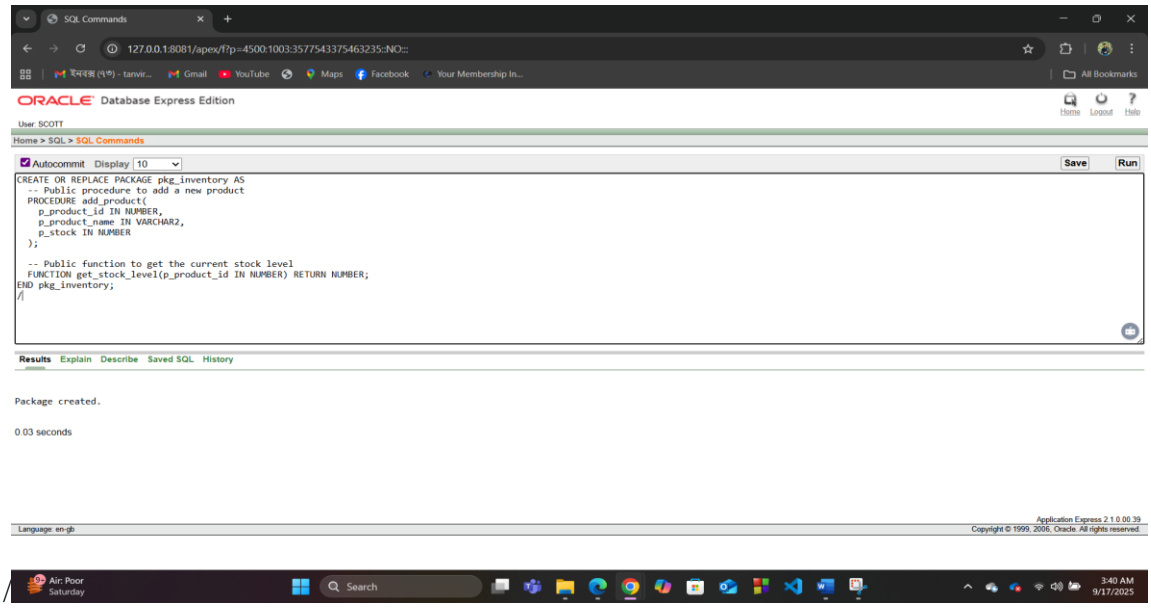
Package Body:

```
CREATE OR REPLACE PACKAGE BODY pkg_employee_utils AS
  FUNCTION get_full_name(p_employee_id IN employees.employee_id%TYPE)
    RETURN VARCHAR2 AS
    v_full_name VARCHAR2(100);
  BEGIN
    SELECT first_name || ' ' || last_name INTO v_full_name
    FROM employees
    WHERE employee_id = p_employee_id;
    RETURN v_full_name;
  END get_full_name;

  PROCEDURE increase_salary(
    p_employee_id IN employees.employee_id%TYPE,
    p_raise_percent IN NUMBER
  ) AS
  BEGIN
    UPDATE employees
    SET salary = salary * (1 + p_raise_percent / 100)
    WHERE employee_id = p_employee_id;
    COMMIT;
  END increase_salary;
END pkg_employee_utils;
/
```



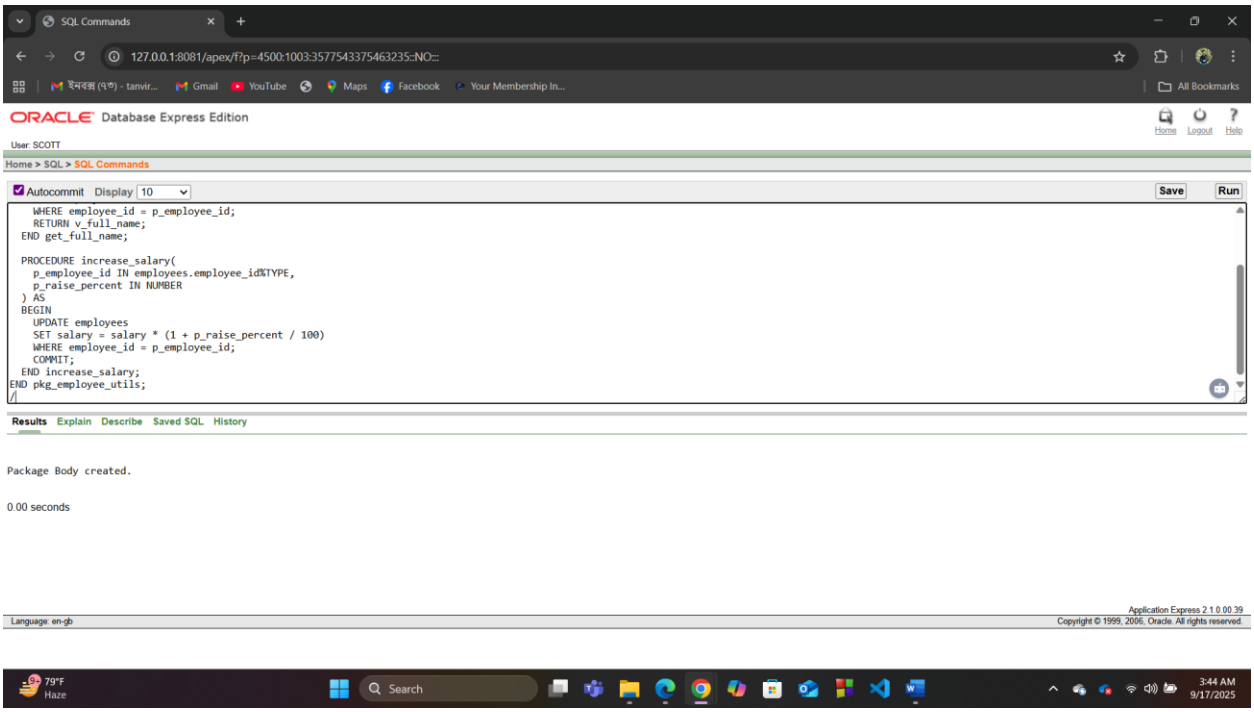
2. Create a package to manage inventory. It should include a procedure to add a new product and a function to check the current stock level. This package should use a private function to validate the stock level before adding a product

```
CREATE OR REPLACE PACKAGE pkg_inventory AS
    PROCEDURE add_product(
    p_product_id IN NUMBER,
    p_product_name IN VARCHAR2,
    p_stock IN NUMBER
  );
  FUNCTION get_stock_level(p_product_id IN NUMBER) RETURN NUMBER;
END pkg_inventory;
```



Package Body:

```
CREATE OR REPLACE PACKAGE BODY pkg_employee_utils AS
  FUNCTION get_full_name(p_employee_id IN employees.employee_id%TYPE)
    RETURN VARCHAR2 AS
    v_full_name VARCHAR2(100);
  BEGIN
    SELECT first_name || ' ' || last_name INTO v_full_name
    FROM employees
    WHERE employee_id = p_employee_id;
    RETURN v_full_name;
  END get_full_name;
 PROCEDURE increase_salary(
    p_employee_id IN employees.employee_id%TYPE,
    p_raise_percent IN NUMBER
  ) AS
  BEGIN
    UPDATE employees
    SET salary = salary * (1 + p_raise_percent / 100)
    WHERE employee_id = p_employee_id;
    COMMIT;
  END increase_salary;
END pkg_employee_utils;
/
```



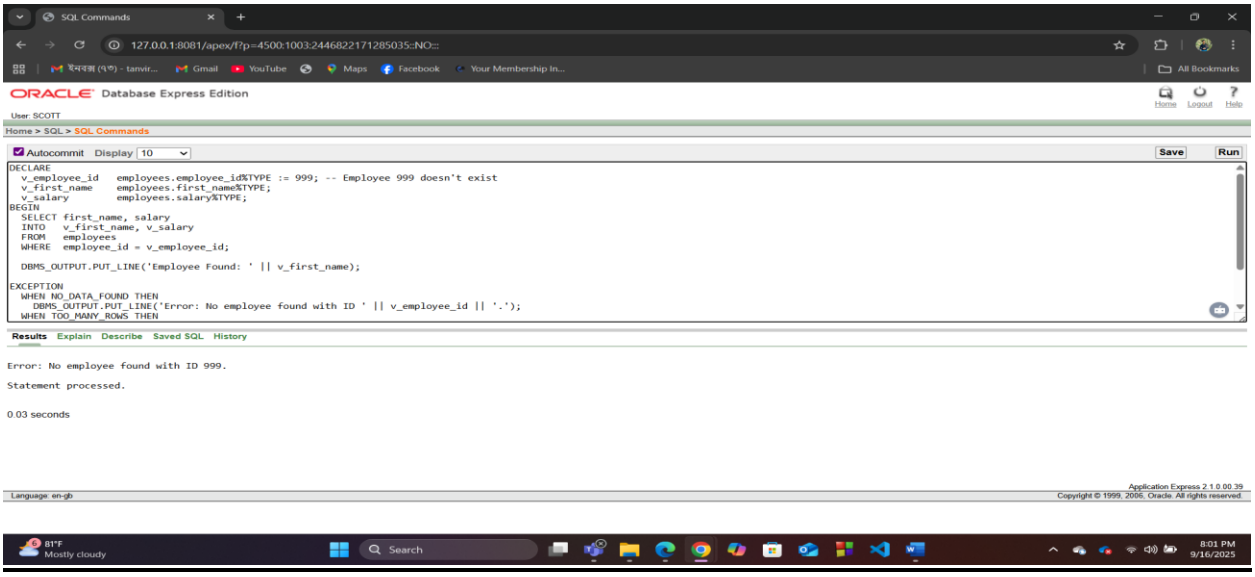
Query Writing

Exceptions handling: (Basic PL/SQL)

Variable:

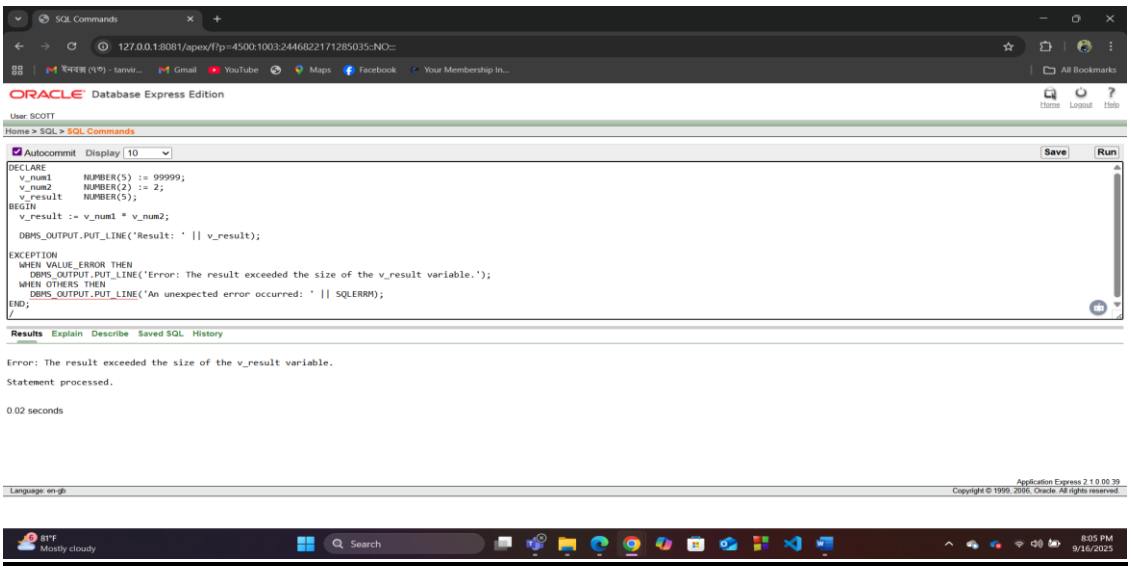
1. Handle situations where a SELECT...INTO statement in PL/SQL returns zero rows or more than one row.

```
DECLARE
  v_employee_id   employees.employee_id%TYPE := 999; -- Employee 999 doesn't exist
  v_first_name    employees.first_name%TYPE;
  v_salary        employees.salary%TYPE;
BEGIN
  SELECT first_name, salary
  INTO   v_first_name, v_salary
  FROM   employees
  WHERE  employee_id = v_employee_id;
DBMS_OUTPUT.PUT_LINE('Employee Found: ' || v_first_name);
EXCEPTION
  WHEN NO_DATA_FOUND THEN
    DBMS_OUTPUT.PUT_LINE('Error: No employee found with ID ' || v_employee_id || '.');
  WHEN TOO_MANY_ROWS THEN
    DBMS_OUTPUT.PUT_LINE('Error: Multiple employees found with ID ' || v_employee_id ||
'.');
  WHEN OTHERS THEN
    DBMS_OUTPUT.PUT_LINE('An unexpected error occurred: ' || SQLERRM);
END;
/
```



2. when this PL/SQL block is executed, and which exception handler will catch it.

```
DECLARE
  v_num1      NUMBER(5) := 99999;
  v_num2      NUMBER(2) := 2;
  v_result    NUMBER(5);
BEGIN
  v_result := v_num1 * v_num2;
 DBMS_OUTPUT.PUT_LINE('Result: ' || v_result);
EXCEPTION
  WHEN VALUE_ERROR THEN
    DBMS_OUTPUT.PUT_LINE('Error: The result exceeded the size of the v_result variable.');
  WHEN OTHERS THEN
    DBMS_OUTPUT.PUT_LINE('An unexpected error occurred: ' || SQLERRM);
END;
/
```

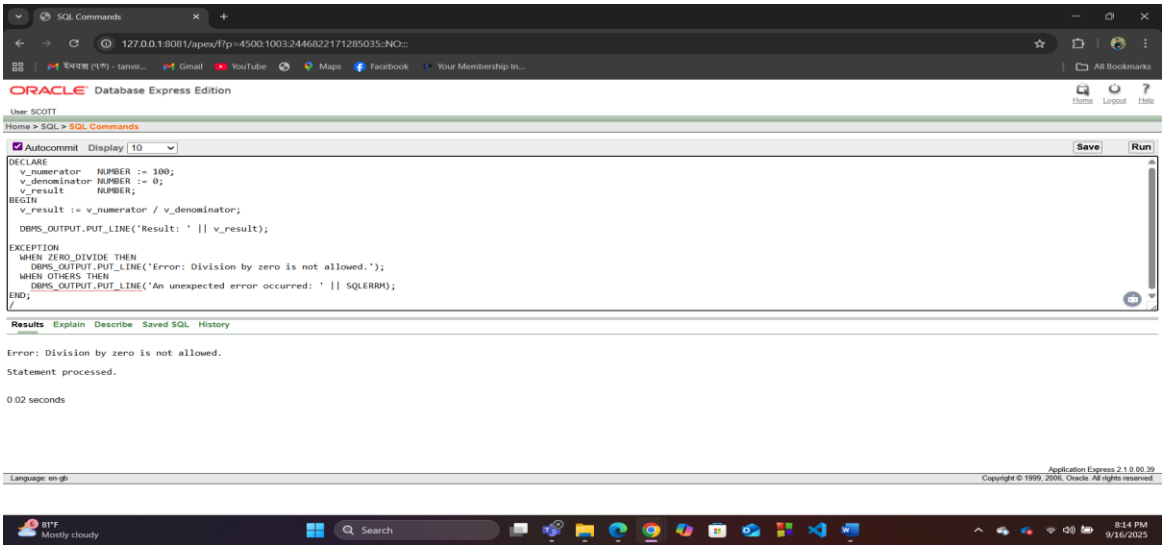


Operators

1.prevent a PL/SQL block from failing if a division-by-zero operation occurs.

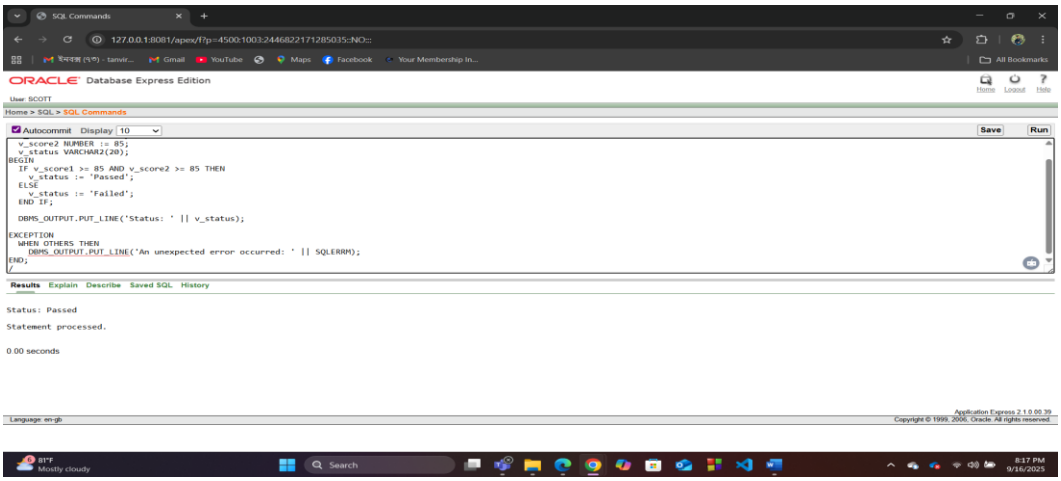
```
DECLARE
  v_numerator   NUMBER := 100;
  v_denominator NUMBER := 0;
  v_result      NUMBER;
BEGIN
  v_result := v_numerator / v_denominator;
  DBMS_OUTPUT.PUT_LINE('Result: ' || v_result);
EXCEPTION
  WHEN ZERO_DIVIDE THEN
```

```
    DBMS_OUTPUT.PUT_LINE('Error: Division by zero is not allowed.');
  WHEN OTHERS THEN
    DBMS_OUTPUT.PUT_LINE('An unexpected error occurred: ' || SQLERRM);
END;
/
```



2. **Handle Logical Operator with Exception Handling**

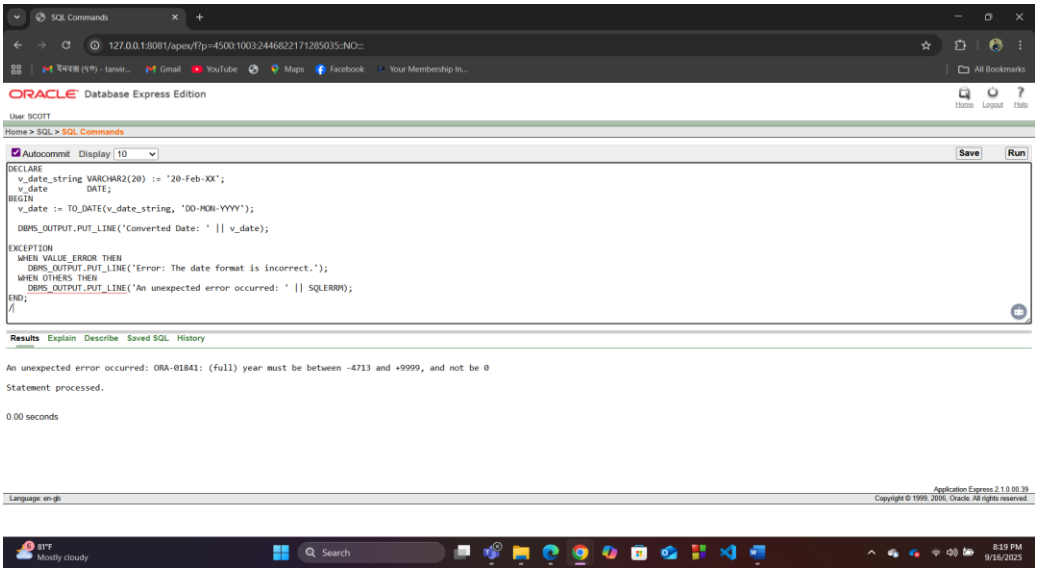
```
DECLARE
  v_score1 NUMBER := 90;
  v_score2 NUMBER := 85;
  v_status VARCHAR2(20);
BEGIN
  IF v_score1 >= 85 AND v_score2 >= 85 THEN
    v_status := 'Passed';
  ELSE
    v_status := 'Failed';
  END IF;
DBMS_OUTPUT.PUT_LINE('Status: ' || v_status);
EXCEPTION
  WHEN OTHERS THEN
    DBMS_OUTPUT.PUT_LINE('An unexpected error occurred: ' || SQLERRM);
END;
/
```



Single-row-function

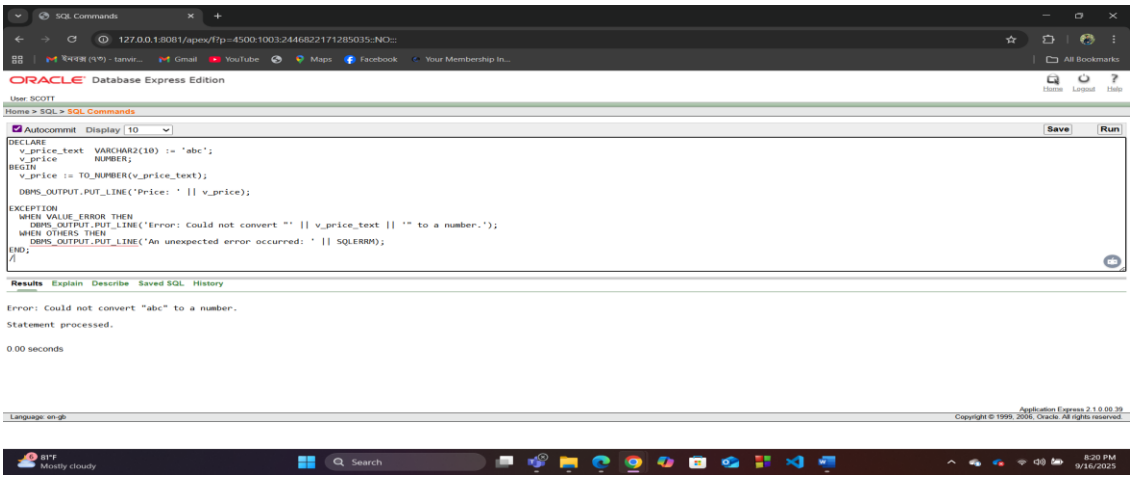
1.Handle a data conversion failure when using functions like TO_DATE.

```
DECLARE
  v_date_string VARCHAR2(20) := '20-Feb-XX';
  v_date        DATE;
BEGIN
  v_date := TO_DATE(v_date_string, 'DD-MON-YYYY');
 DBMS_OUTPUT.PUT_LINE('Converted Date: ' || v_date);
EXCEPTION
  WHEN VALUE_ERROR THEN
    DBMS_OUTPUT.PUT_LINE('Error: The date format is incorrect.');
  WHEN OTHERS THEN
    DBMS_OUTPUT.PUT_LINE('An unexpected error occurred: ' || SQLERRM);
END;
/
```



2. Handle a data conversion failure when using functions like TO_NUMBER.

```
DECLARE
  v_price_text  VARCHAR2(10) := 'abc';
  v_price       NUMBER;
BEGIN
  v_price := TO_NUMBER(v_price_text);
DBMS_OUTPUT.PUT_LINE('Price: ' || v_price);
EXCEPTION
  WHEN VALUE_ERROR THEN
    DBMS_OUTPUT.PUT_LINE('Error: Could not convert ''' || v_price_text || ''' to a number.');
  WHEN OTHERS THEN
    DBMS_OUTPUT.PUT_LINE('An unexpected error occurred: ' || SQLERRM);
END;
/
```

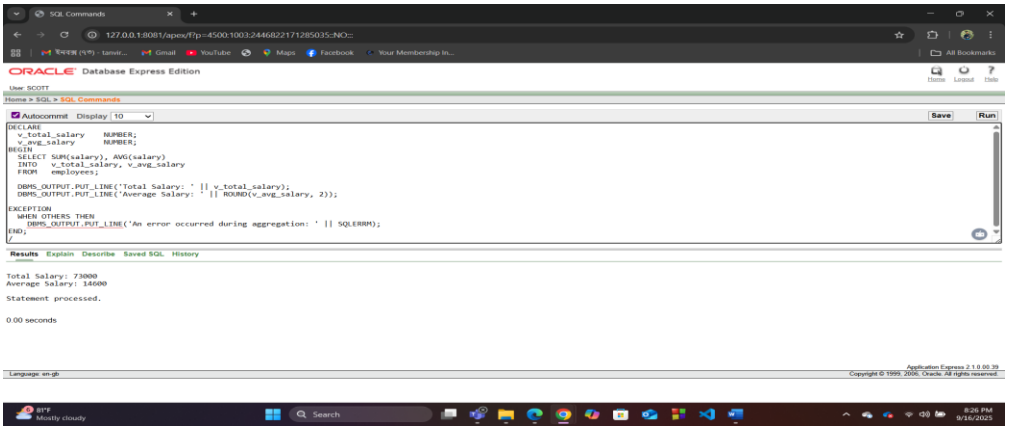


Group Function

1. Handle potential errors when aggregating data with functions like AVG.

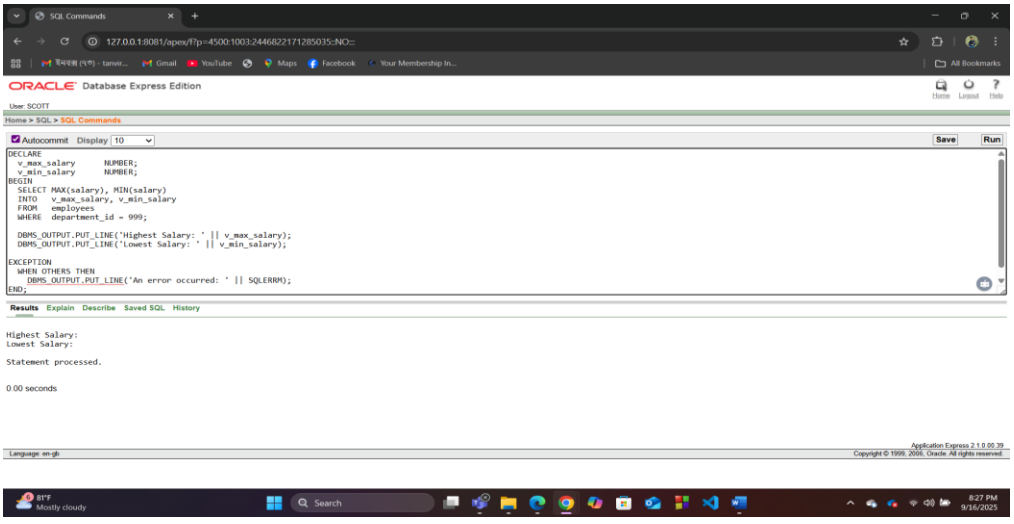
```
DECLARE
  v_total_salary    NUMBER;
  v_avg_salary      NUMBER;
BEGIN
  SELECT SUM(salary), AVG(salary)
  INTO   v_total_salary, v_avg_salary
  FROM   employees;
  DBMS_OUTPUT.PUT_LINE('Total Salary: ' || v_total_salary);
  DBMS_OUTPUT.PUT_LINE('Average Salary: ' || ROUND(v_avg_salary, 2));
EXCEPTION
  WHEN OTHERS THEN
    DBMS_OUTPUT.PUT_LINE('An error occurred during aggregation: ' || SQLERRM);
END;
```

/



2. **Handle potential errors when aggregating data with functions like min,max.**

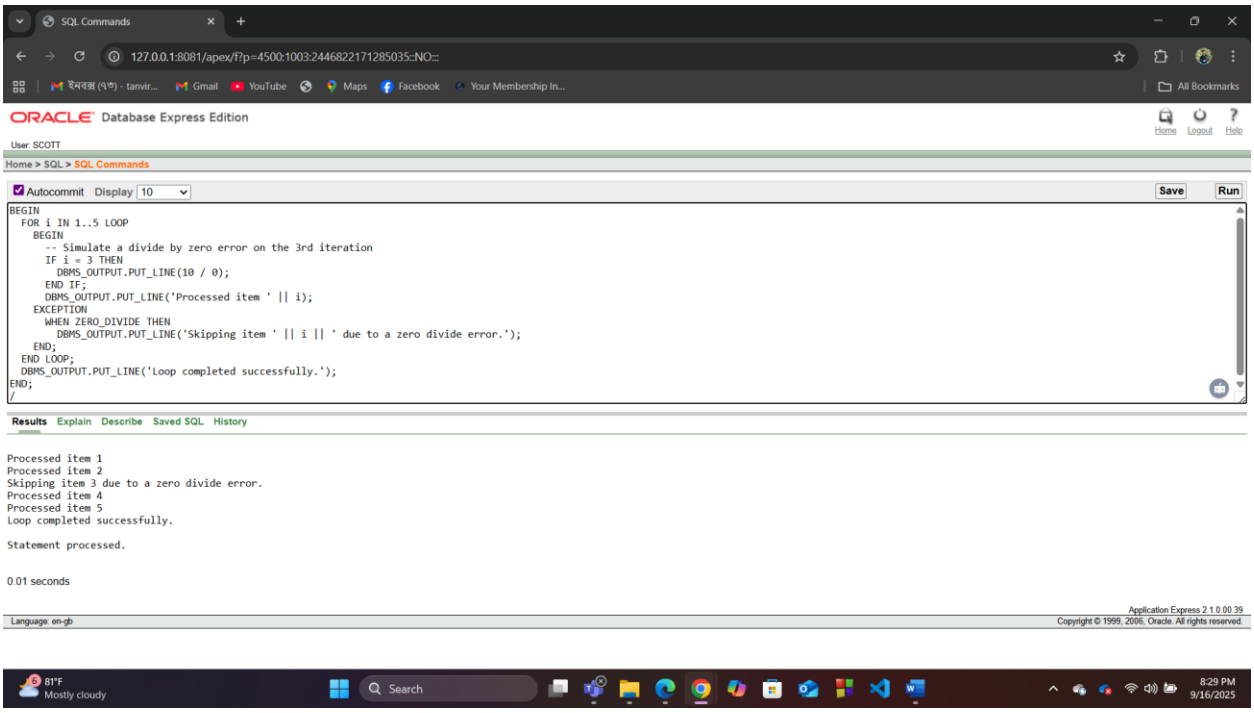
```
DECLARE
  v_max_salary      NUMBER;
  v_min_salary      NUMBER;
BEGIN
  SELECT MAX(salary), MIN(salary)
  INTO   v_max_salary, v_min_salary
  FROM   employees
  WHERE  department_id = 999;
  DBMS_OUTPUT.PUT_LINE('Highest Salary: ' || v_max_salary);
  DBMS_OUTPUT.PUT_LINE('Lowest Salary: ' || v_min_salary);
EXCEPTION
  WHEN OTHERS THEN
    DBMS_OUTPUT.PUT_LINE('An error occurred: ' || SQLERRM);
END;
/
```



Loop

1. Ensure a FOR loop handles an error in its processing logic without terminating the entire PL/SQL block.

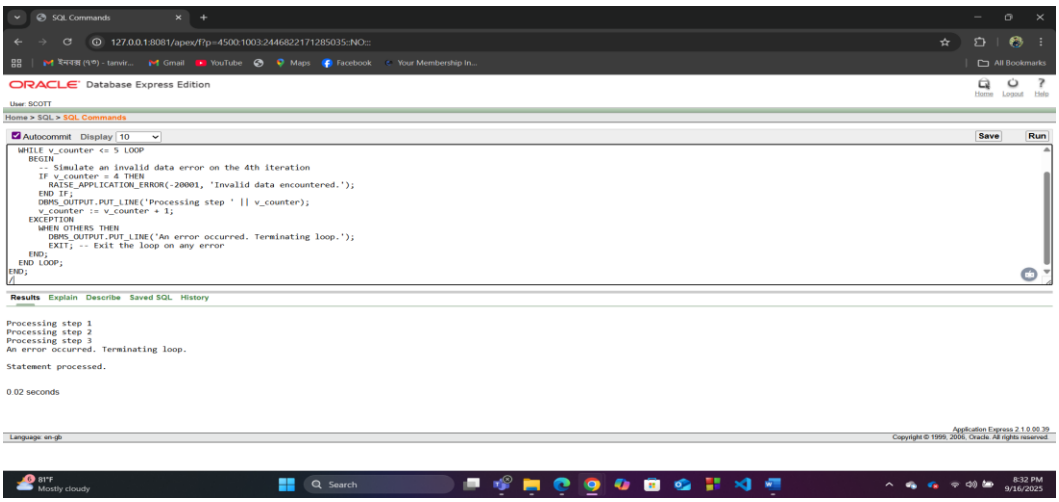
```
BEGIN
  FOR i IN 1..5 LOOP
    BEGIN
      -- Simulate a divide by zero error on the 3rd iteration
      IF i = 3 THEN
        DBMS_OUTPUT.PUT_LINE(10 / 0);
      END IF;
      DBMS_OUTPUT.PUT_LINE('Processed item ' || i);
    EXCEPTION
      WHEN ZERO_DIVIDE THEN
        DBMS_OUTPUT.PUT_LINE('Skipping item ' || i || ' due to a zero divide error.');
    END;
  END LOOP;
  DBMS_OUTPUT.PUT_LINE('Loop completed successfully.');
END;
/
```



2. Ensure a While loop handles an error in its processing logic without terminating the entire PL/SQL block.

```
DECLARE
  v_counter NUMBER := 1;
BEGIN
```

```
 WHILE v_counter <= 5 LOOP
  BEGIN
     IF v_counter = 4 THEN
     RAISE_APPLICATION_ERROR(-20001, 'Invalid data encountered.');
    END IF;
    DBMS_OUTPUT.PUT_LINE('Processing step ' || v_counter);
    v_counter := v_counter + 1;
  EXCEPTION
    WHEN OTHERS THEN
      DBMS_OUTPUT.PUT_LINE('An error occurred. Terminating loop.');
      EXIT; -- Exit the loop on any error
  END;
 END LOOP;
END;
/
```

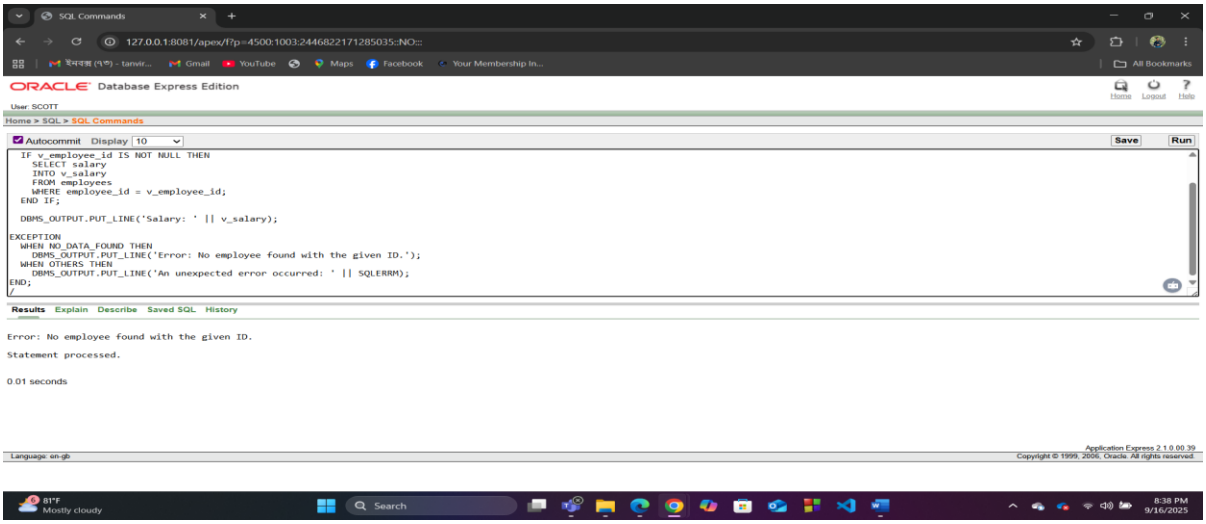


Conditional Statements

1.An IF statement trigger an exception that needs to be handled, even if the logic itself is correct.

```
DECLARE
 v_employee_id NUMBER := 999;
 v_salary      NUMBER;
BEGIN
 IF v_employee_id IS NOT NULL THEN
   SELECT salary
   INTO v_salary
   FROM employees
   WHERE employee_id = v_employee_id;
```

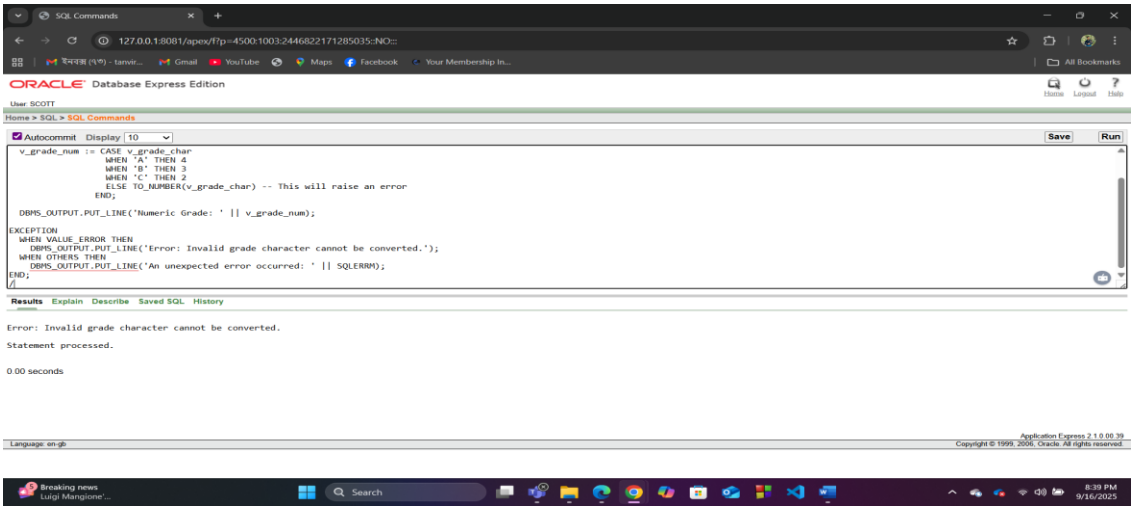
```
  END IF;
  DBMS_OUTPUT.PUT_LINE('Salary: ' || v_salary);
EXCEPTION
  WHEN NO_DATA_FOUND THEN
    DBMS_OUTPUT.PUT_LINE('Error: No employee found with the given ID.');
  WHEN OTHERS THEN
    DBMS_OUTPUT.PUT_LINE('An unexpected error occurred: ' || SQLERRM);
END;
/
```



2. An CASE statement trigger an exception that needs to be handled, even if the logic itself is correct.

```
DECLARE
  v_grade_char VARCHAR2(2) := 'X';
  v_grade_num  NUMBER;
BEGIN
  v_grade_num := CASE v_grade_char
                   WHEN 'A' THEN 4
                   WHEN 'B' THEN 3
                   WHEN 'C' THEN 2
                   ELSE TO_NUMBER(v_grade_char) -- This will raise an error
                 END;
  DBMS_OUTPUT.PUT_LINE('Numeric Grade: ' || v_grade_num);
EXCEPTION
  WHEN VALUE_ERROR THEN
    DBMS_OUTPUT.PUT_LINE('Error: Invalid grade character cannot be converted.');
  WHEN OTHERS THEN
    DBMS_OUTPUT.PUT_LINE('An unexpected error occurred: ' || SQLERRM);
END;
```

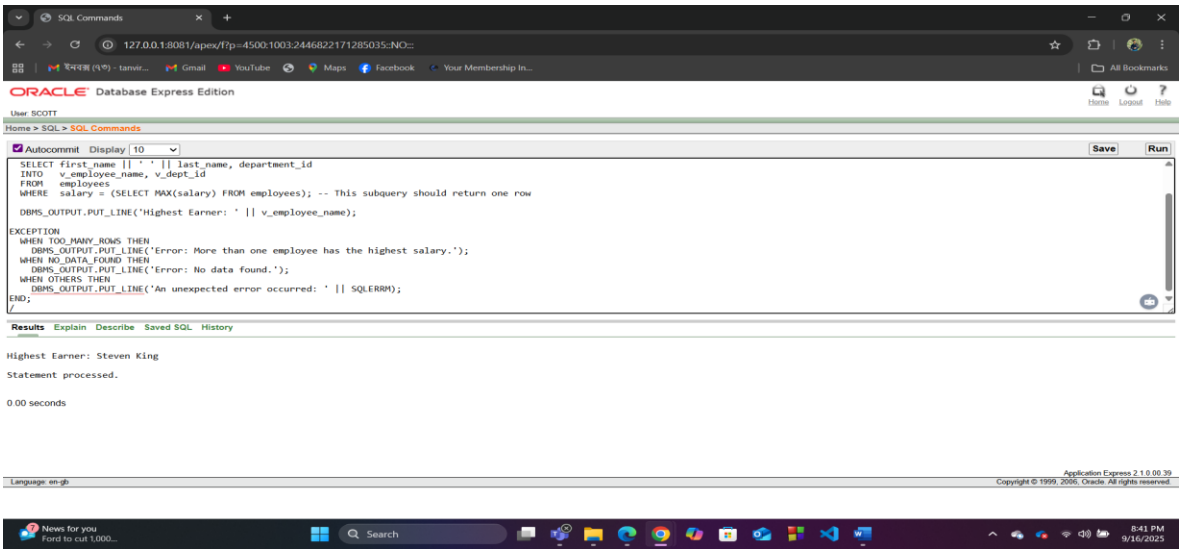
/



Subqueries

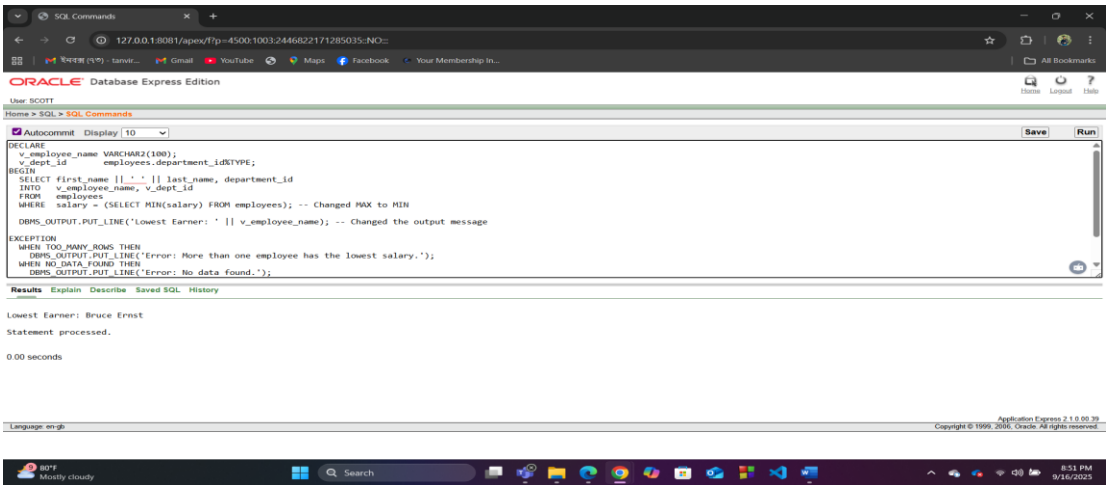
1. Handle when a SELECT...INTO statement uses a scalar subquery.

```
DECLARE
  v_employee_name VARCHAR2(100);
  v_dept_id       employees.department_id%TYPE;
BEGIN
  SELECT first_name || ' ' || last_name, department_id
  INTO   v_employee_name, v_dept_id
  FROM   employees
  WHERE  salary = (SELECT MAX(salary) FROM employees); -- This subquery should return one row
    DBMS_OUTPUT.PUT_LINE('Highest Earner: ' || v_employee_name);
EXCEPTION
  WHEN TOO_MANY_ROWS THEN
    DBMS_OUTPUT.PUT_LINE('Error: More than one employee has the highest salary.');
  WHEN NO_DATA_FOUND THEN
    DBMS_OUTPUT.PUT_LINE('Error: No data found.');
  WHEN OTHERS THEN
    DBMS_OUTPUT.PUT_LINE('An unexpected error occurred: ' || SQLERRM);
END;
/
```



2. Handle when a SELECT...INTO statement uses a scalar subquery.

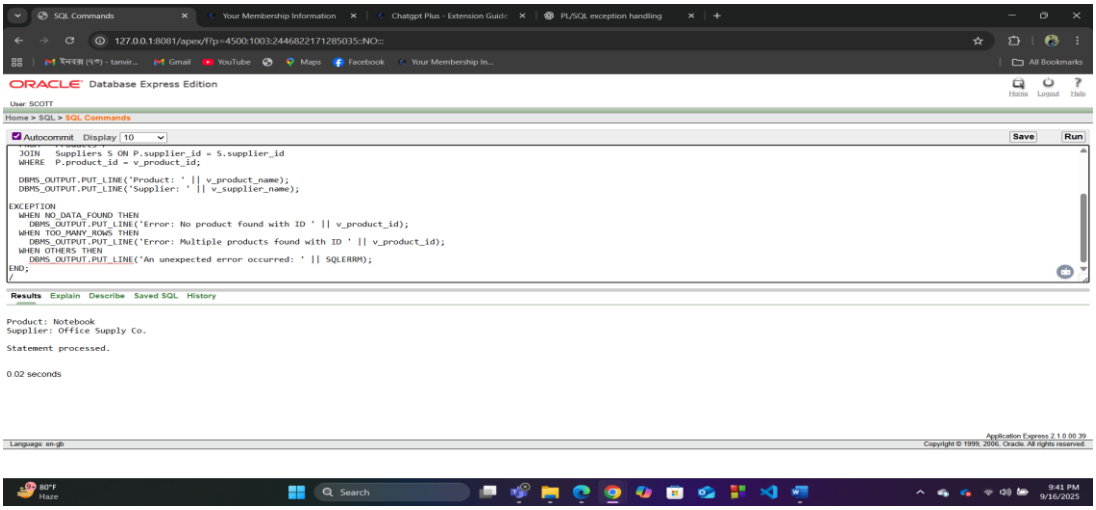
```
DECLARE
  v_employee_name VARCHAR2(100);
  v_dept_id       employees.department_id%TYPE;
BEGIN
  SELECT first_name || ' ' || last_name, department_id
  INTO   v_employee_name, v_dept_id
  FROM   employees
  WHERE  salary = (SELECT MIN(salary) FROM employees); -- Changed MAX to MIN
  DBMS_OUTPUT.PUT_LINE('Lowest Earner: ' || v_employee_name);
EXCEPTION
  WHEN TOO_MANY_ROWS THEN
    DBMS_OUTPUT.PUT_LINE('Error: More than one employee has the lowest salary.');
  WHEN NO_DATA_FOUND THEN
    DBMS_OUTPUT.PUT_LINE('Error: No data found.');
  WHEN OTHERS THEN
    DBMS_OUTPUT.PUT_LINE('An unexpected error occurred: ' || SQLERRM);
END;/
```



Joining

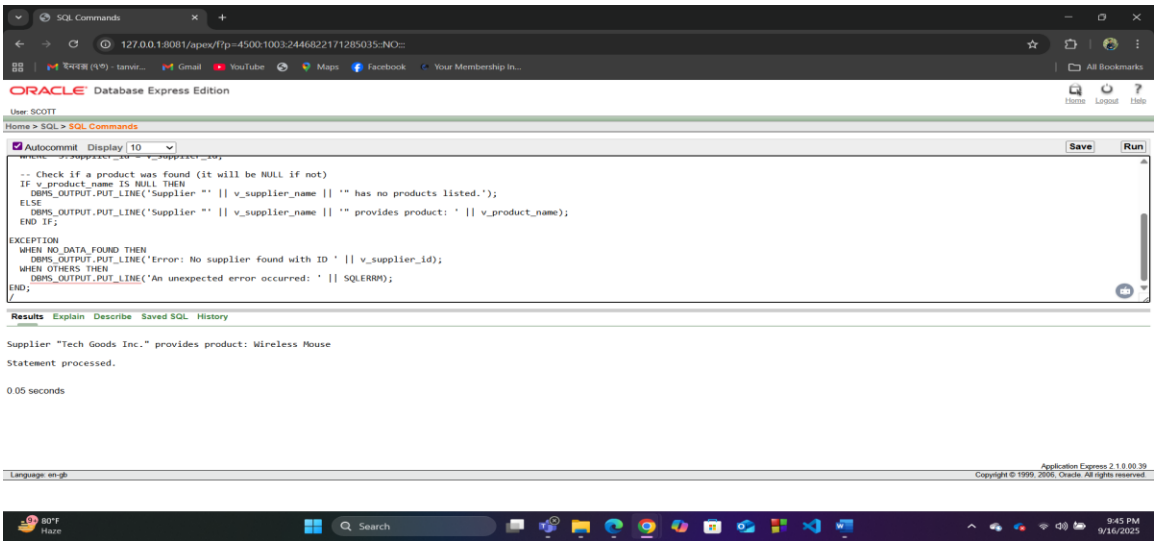
1. Use a JOIN to find a product's name and its supplier's name, and handle to prevent the code from failing.

```
DECLARE
  v_product_id    NUMBER := 102; -- Change this ID to test the code
  v_product_name  Products.product_name%TYPE;
  v_supplier_name Suppliers.supplier_name%TYPE;
BEGIN
 SELECT P.product_name, S.supplier_name
  INTO   v_product_name, v_supplier_name
  FROM   Products P
  JOIN   Suppliers S ON P.supplier_id = S.supplier_id
  WHERE  P.product_id = v_product_id;
 DBMS_OUTPUT.PUT_LINE('Product: ' || v_product_name);
  DBMS_OUTPUT.PUT_LINE('Supplier: ' || v_supplier_name);
EXCEPTION
  WHEN NO_DATA_FOUND THEN
    DBMS_OUTPUT.PUT_LINE('Error: No product found with ID ' || v_product_id);
  WHEN TOO_MANY_ROWS THEN
    DBMS_OUTPUT.PUT_LINE('Error: Multiple products found with ID ' || v_product_id);
  WHEN OTHERS THEN
    DBMS_OUTPUT.PUT_LINE('An unexpected error occurred: ' || SQLERRM);
END;
/
```



2. Use a LEFT JOIN to find out a specific supplier provides, including suppliers who have no product.

```
DECLARE
  v_supplier_id   NUMBER := 1; -- Change to a supplier ID with no products to see the result
  v_supplier_name Suppliers.supplier_name%TYPE;
  v_product_name  Products.product_name%TYPE;
BEGIN
  SELECT S.supplier_name, P.product_name
  INTO   v_supplier_name, v_product_name
  FROM   Suppliers S
  LEFT JOIN   Products P ON S.supplier_id = P.supplier_id
  WHERE  S.supplier_id = v_supplier_id;
  IF v_product_name IS NULL THEN
    DBMS_OUTPUT.PUT_LINE('Supplier ''' || v_supplier_name || ''' has no products listed.');
  ELSE
    DBMS_OUTPUT.PUT_LINE('Supplier ''' || v_supplier_name || ''' provides product: ' ||
v_product_name);
  END IF;
EXCEPTION
  WHEN NO_DATA_FOUND THEN
    DBMS_OUTPUT.PUT_LINE('Error: No supplier found with ID ' || v_supplier_id);
  WHEN OTHERS THEN
    DBMS_OUTPUT.PUT_LINE('An unexpected error occurred: ' || SQLERRM);
END;
/
```

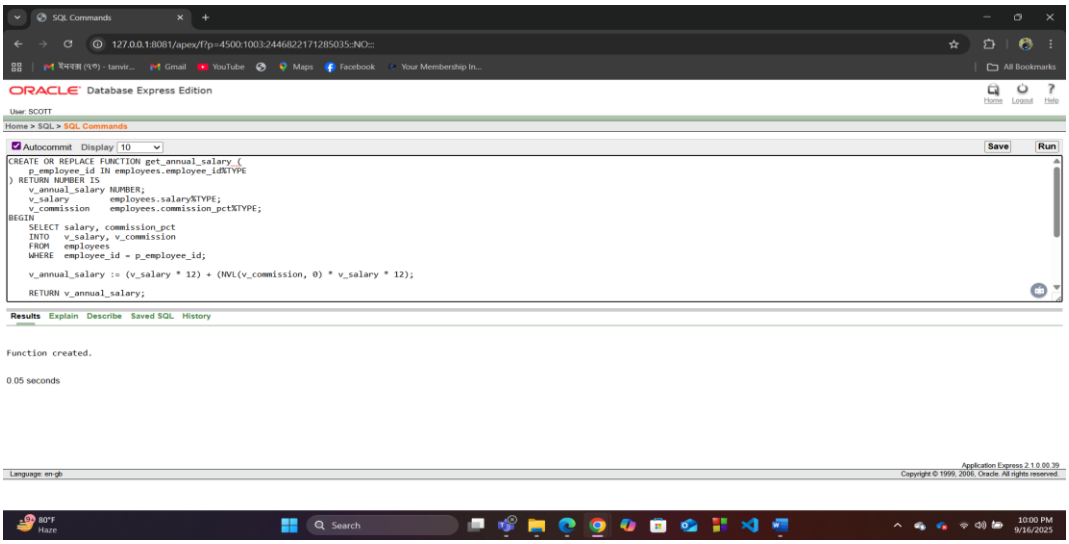


Advance PL/SQL Exception handling

Store Function

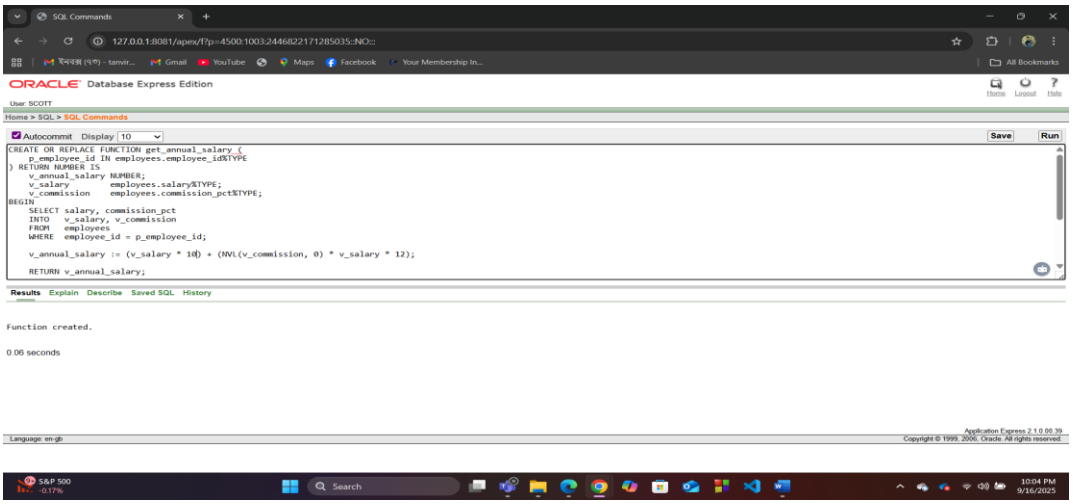
1. Create a stored function that calculates an employee's annual salary and includes exception handling for cases where the employee does not exist.

```
CREATE OR REPLACE FUNCTION get_annual_salary (
   p_employee_id IN employees.employee_id%TYPE
) RETURN NUMBER IS
   v_annual_salary NUMBER;
   v_salary        employees.salary%TYPE;
   v_commission    employees.commission_pct%TYPE;
BEGIN
   SELECT salary, commission_pct
   INTO   v_salary, v_commission
   FROM   employees
   WHERE  employee_id = p_employee_id;
    v_annual_salary := (v_salary * 12) + (NVL(v_commission, 0) * v_salary * 12);
   RETURN v_annual_salary;
EXCEPTION
   WHEN NO_DATA_FOUND THEN
      DBMS_OUTPUT.PUT_LINE('Error: Employee ' || p_employee_id || ' not found.');
      RETURN NULL;
   WHEN OTHERS THEN
      DBMS_OUTPUT.PUT_LINE('An unexpected error occurred: ' || SQLERRM);
      RETURN NULL;
END;
/
```



2. Create a stored function that calculates an employee's annual salary and includes exception handling for cases where the employee does not exist.

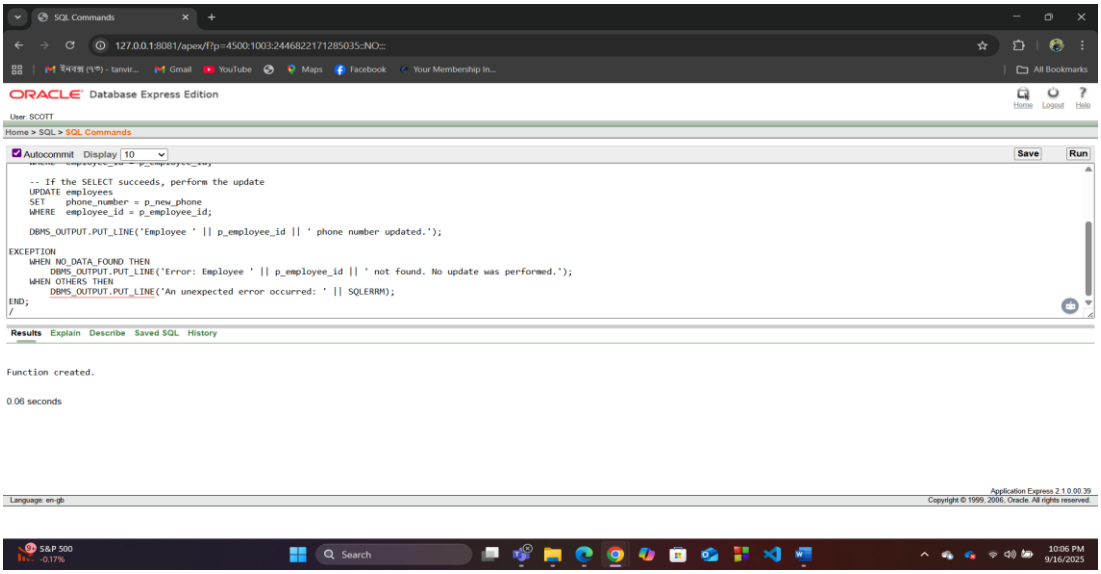
```
CREATE OR REPLACE FUNCTION get_annual_salary (
   p_employee_id IN employees.employee_id%TYPE
) RETURN NUMBER IS
   v_annual_salary NUMBER;
   v_salary        employees.salary%TYPE;
   v_commission    employees.commission_pct%TYPE;
BEGIN
   SELECT salary, commission_pct
   INTO   v_salary, v_commission
   FROM   employees
   WHERE  employee_id = p_employee_id;
     v_annual_salary := (v_salary * 10) + (NVL(v_commission, 0) * v_salary * 12);
    RETURN v_annual_salary;
EXCEPTION
   WHEN NO_DATA_FOUND THEN
      DBMS_OUTPUT.PUT_LINE('Error: Employee ' || p_employee_id || ' not found.');
      RETURN NULL;
   WHEN OTHERS THEN
      DBMS_OUTPUT.PUT_LINE('An unexpected error occurred: ' || SQLERRM);
      RETURN NULL;
END;
/
```



Stored Procedure

1. Create a stored procedure to update an employee's phone number and handle the case where the employee ID does not exist.

```
CREATE OR REPLACE PROCEDURE update_employee_phone (
   p_employee_id IN employees.employee_id%TYPE,
   p_new_phone   IN employees.phone_number%TYPE
) IS
   v_employee_id employees.employee_id%TYPE;
BEGIN
   SELECT employee_id INTO v_employee_id
   FROM   employees
   WHERE  employee_id = p_employee_id;
   UPDATE employees
   SET    phone_number = p_new_phone
   WHERE  employee_id = p_employee_id;
 DBMS_OUTPUT.PUT_LINE('Employee ' || p_employee_id || ' phone number updated.');
EXCEPTION
   WHEN NO_DATA_FOUND THEN
      DBMS_OUTPUT.PUT_LINE('Error: Employee ' || p_employee_id || ' not found. No update was performed.');
   WHEN OTHERS THEN
      DBMS_OUTPUT.PUT_LINE('An unexpected error occurred: ' || SQLERRM);
END;
/
```



2. Create a stored procedure to update an employee's phone number and handle the case where the employee ID does not exist.

```
CREATE OR REPLACE PROCEDURE insert_new_customer (
   p_c_id     IN customer.c_id%TYPE,
   p_c_name   IN customer.c_name%TYPE,
   p_c_email  IN customer.c_email%TYPE
) IS
BEGIN
   INSERT INTO customer (c_id, c_name, c_email)
   VALUES (p_c_id, p_c_name, p_c_email);
DBMS_OUTPUT.PUT_LINE('New customer ' || p_c_name || ' inserted successfully.');
EXCEPTION
   WHEN DUP_VAL_ON_INDEX THEN
      DBMS_OUTPUT.PUT_LINE('Error: Customer with ID ' || p_c_id || ' already exists. No record was inserted.');
   WHEN OTHERS THEN
      DBMS_OUTPUT.PUT_LINE('An unexpected error occurred: ' || SQLERRM);
END;
/
```

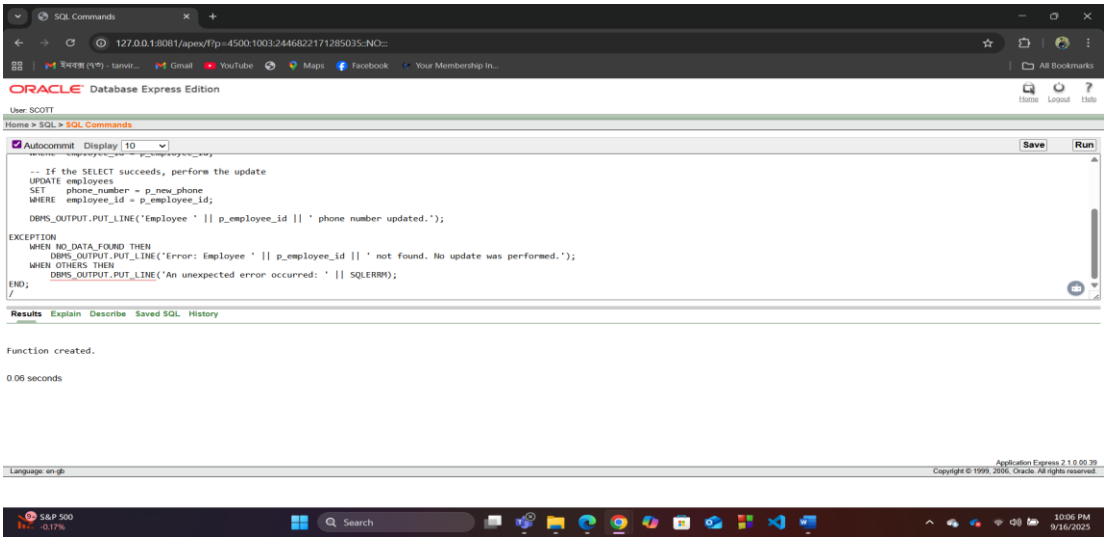
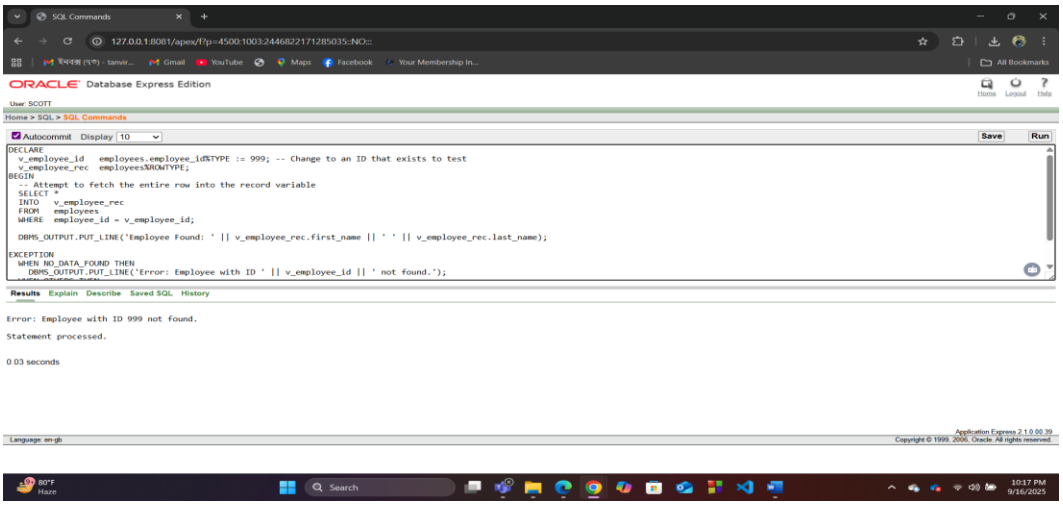


Table-Based Record

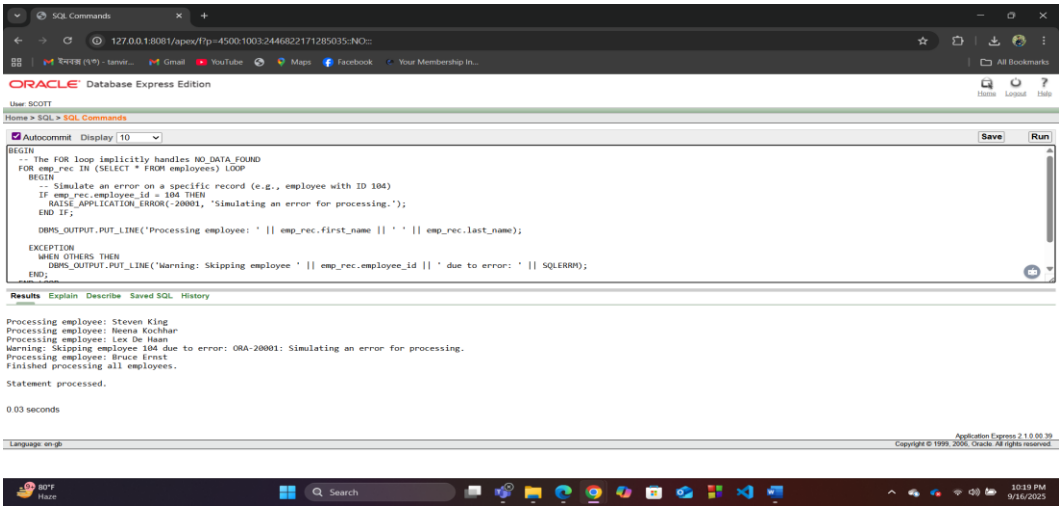
1. Create a table-based record (%ROWTYPE) to fetch a single employee's data and handle exceptions if no record is found.

```
DECLARE
  v_employee_id   employees.employee_id%TYPE := 999; -- Change to an ID that exists to test
  v_employee_rec  employees%ROWTYPE;
BEGIN
  SELECT *
  INTO   v_employee_rec
  FROM   employees
  WHERE  employee_id = v_employee_id;
 DBMS_OUTPUT.PUT_LINE('Employee   Found:   '   ||   v_employee_rec.first_name   ||   '   '   ||
v_employee_rec.last_name);
EXCEPTION
  WHEN NO_DATA_FOUND THEN
    DBMS_OUTPUT.PUT_LINE('Error: Employee with ID ' || v_employee_id || ' not found.');
  WHEN OTHERS THEN
    DBMS_OUTPUT.PUT_LINE('An unexpected error occurred: ' || SQLERRM);
END;
/
```



2.Find Multiple Records in a FOR loop.

```
BEGIN
  FOR emp_rec IN (SELECT * FROM employees) LOOP
    BEGIN
  IF emp_rec.employee_id = 104 THEN
       RAISE_APPLICATION_ERROR(-20001, 'Simulating an error for processing.');
     END IF;
  DBMS_OUTPUT.PUT_LINE('Processing employee: ' || emp_rec.first_name || ' ' || emp_rec.last_name);
      EXCEPTION
     WHEN OTHERS THEN
       DBMS_OUTPUT.PUT_LINE('Warning: Skipping employee ' || emp_rec.employee_id || ' due to error: ' || SQLERRM);
    END;
  END LOOP;
  DBMS_OUTPUT.PUT_LINE('Finished processing all employees.');
END;
/
```

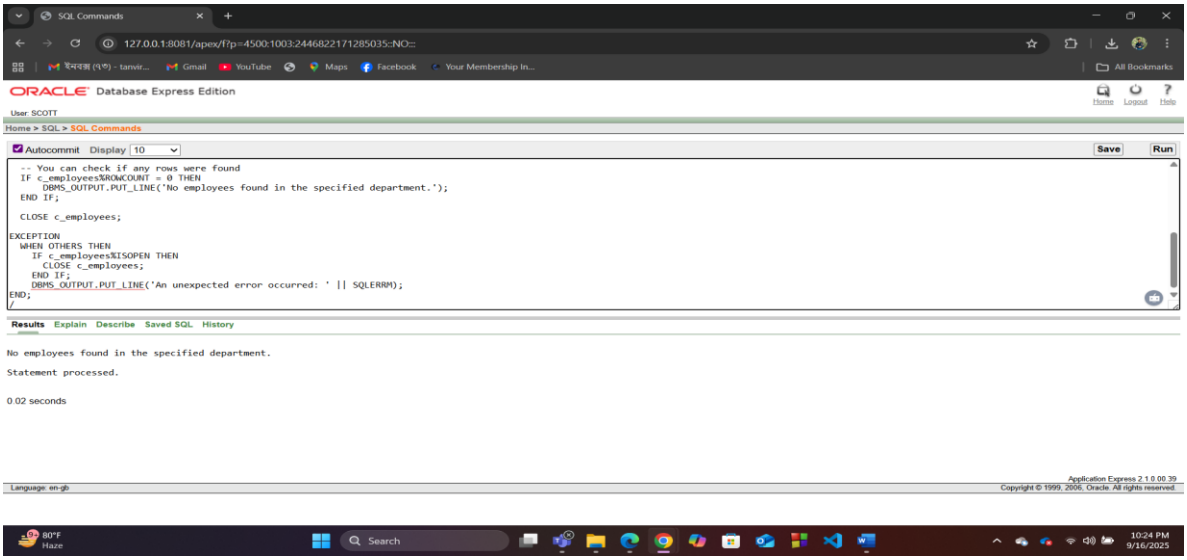


Explicit Cursor

1. Create an explicit cursor to fetch employee data and handle exceptions if no records are found.

```
DECLARE
  CURSOR c_employees IS
    SELECT first_name, last_name, salary
    FROM   employees
    WHERE  department_id = 999; -- Change to a valid department ID to test
  v_first_name  employees.first_name%TYPE;
  v_last_name   employees.last_name%TYPE;
  v_salary      employees.salary%TYPE;
BEGIN
  OPEN c_employees;
  LOOP
    FETCH c_employees INTO v_first_name, v_last_name, v_salary;
    EXIT WHEN c_employees%NOTFOUND;
    DBMS_OUTPUT.PUT_LINE(v_first_name || ' ' || v_last_name || ' has a salary of ' || v_salary);
  END LOOP;
   IF c_employees%ROWCOUNT = 0 THEN
      DBMS_OUTPUT.PUT_LINE('No employees found in the specified department.');
  END IF;
   CLOSE c_employees;
EXCEPTION
  WHEN OTHERS THEN
    IF c_employees%ISOPEN THEN
      CLOSE c_employees;
    END IF;
```

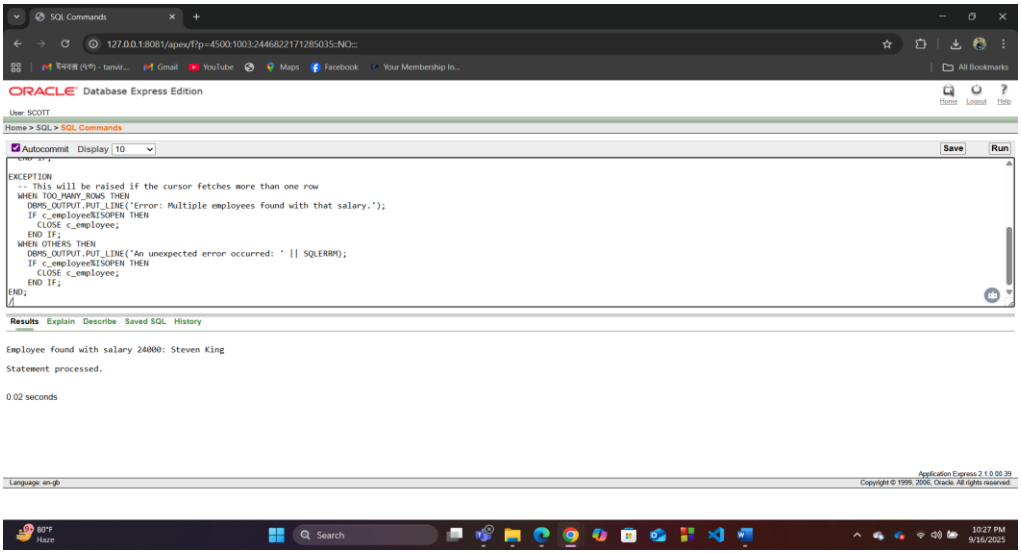
```
   DBMS_OUTPUT.PUT_LINE('An unexpected error occurred: ' || SQLERRM);
END;
/
```



2. Create an explicit cursor to fetch employee data and handle exceptions too many rows?

```
DECLARE
  CURSOR c_employee (p_salary IN employees.salary%TYPE) IS
    SELECT first_name, last_name
    FROM   employees
    WHERE  salary = p_salary;
 v_first_name employees.first_name%TYPE;
  v_last_name  employees.last_name%TYPE;
BEGIN
  OPEN c_employee(24000);
  FETCH c_employee INTO v_first_name, v_last_name;
IF c_employee%FOUND THEN
     DBMS_OUTPUT.PUT_LINE('Employee found with salary 24000: ' || v_first_name || ' ' ||
v_last_name);
  END IF;
EXCEPTION
  WHEN TOO_MANY_ROWS THEN
    DBMS_OUTPUT.PUT_LINE('Error: Multiple employees found with that salary.');
    IF c_employee%ISOPEN THEN
      CLOSE c_employee;
    END IF;
  WHEN OTHERS THEN
    DBMS_OUTPUT.PUT_LINE('An unexpected error occurred: ' || SQLERRM);
```

```
    IF c_employee%ISOPEN THEN
      CLOSE c_employee;
    END IF;
END;
/
```

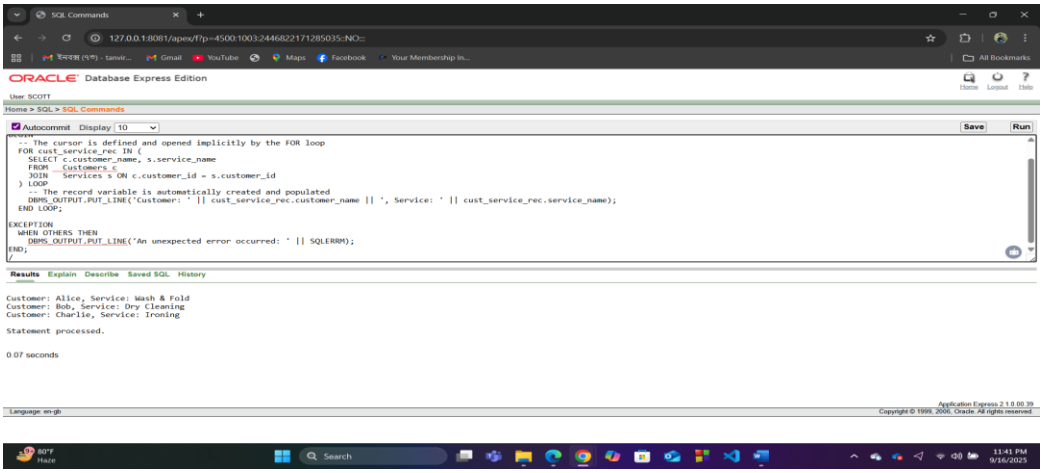


Cursor-Based Record

1.Create a cursor FOR loop to join two tables and handle potential errors.

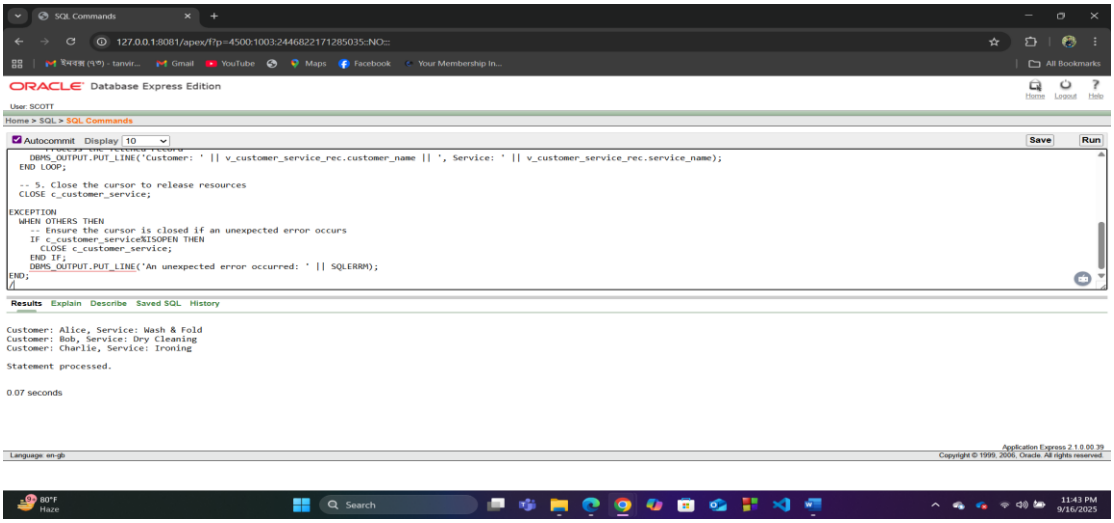
```
    DECLARE
      CURSOR c_customer_service IS
        SELECT c.customer_name, s.service_name
        FROM   Customers c
        JOIN   Services s ON c.customer_id = s.customer_id;
      v_customer_service_rec c_customer_service%ROWTYPE;
    BEGIN
      OPEN c_customer_service;
        LOOP
        FETCH c_customer_service INTO v_customer_service_rec;
          EXIT WHEN c_customer_service%NOTFOUND;
     DBMS_OUTPUT.PUT_LINE('Customer: ' || v_customer_service_rec.customer_name || ',
    Service: ' || v_customer_service_rec.service_name);
      END LOOP;
      CLOSE c_customer_service;
EXCEPTION
      WHEN OTHERS THEN
        IF c_customer_service%ISOPEN THEN
          CLOSE c_customer_service;
        END IF;
```

```
    DBMS_OUTPUT.PUT_LINE('An unexpected error occurred: ' || SQLERRM);
END;
/
```



2.Create an explicit cursor to join two tables and process the results one row at a time?

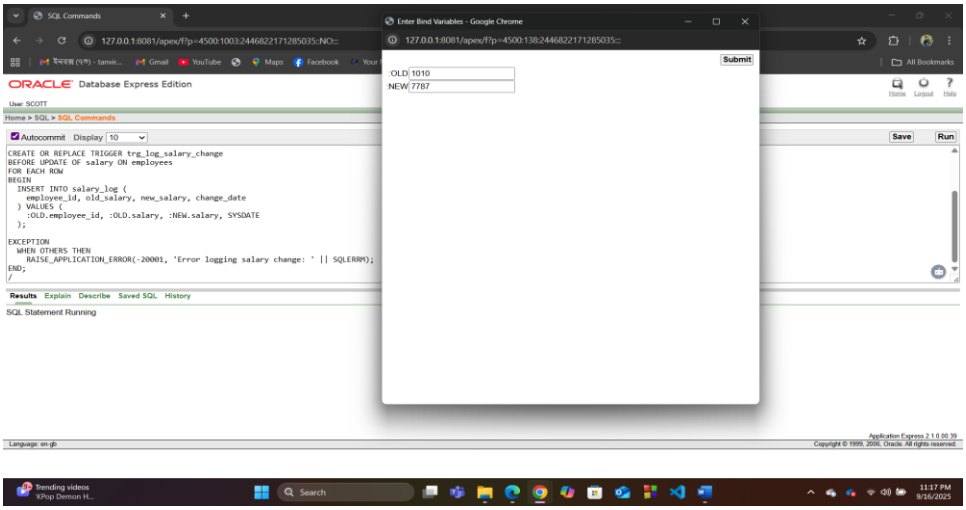
```
DECLARE
  CURSOR c_customer_service IS
    SELECT c.customer_name, s.service_name
    FROM   Customers c
    JOIN   Services s ON c.customer_id = s.customer_id;
  v_customer_service_rec c_customer_service%ROWTYPE;
BEGIN
  OPEN c_customer_service;
    LOOP
    FETCH c_customer_service INTO v_customer_service_rec;
      EXIT WHEN c_customer_service%NOTFOUND;
  DBMS_OUTPUT.PUT_LINE('Customer: ' || v_customer_service_rec.customer_name || ',
Service: ' || v_customer_service_rec.service_name);
  END LOOP;
  CLOSE c_customer_service;
EXCEPTION
  WHEN OTHERS THEN
    IF c_customer_service%ISOPEN THEN
      CLOSE c_customer_service;
    END IF;
  DBMS_OUTPUT.PUT_LINE('An unexpected error occurred: ' || SQLERRM);
END;
/
```



Row-level-trigger

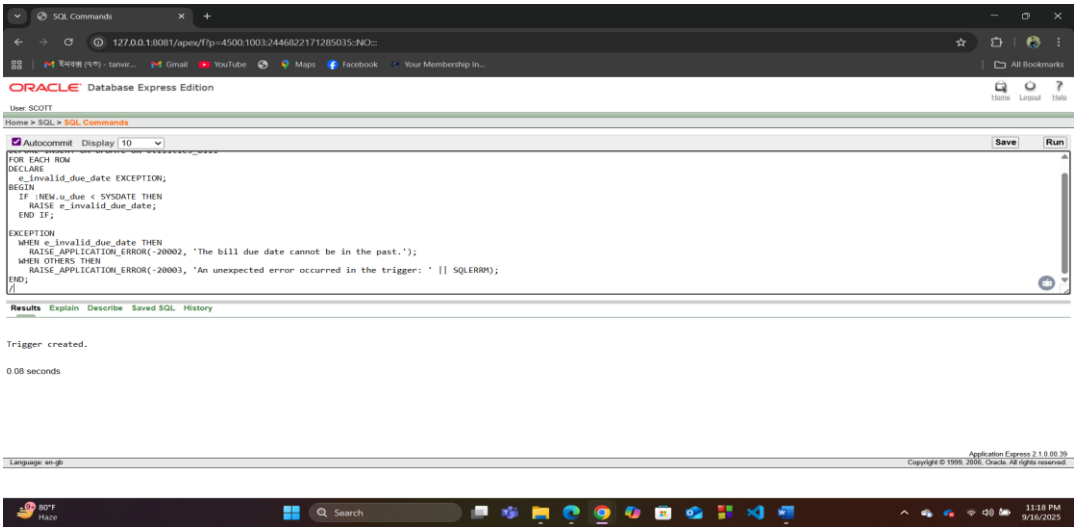
1.Create a row-level trigger to automatically update a salary_log table whenever an employee's salary is changed, and what kind of exceptions should handle.

```
CREATE TABLE salary_log (
    employee_id NUMBER,
    old_salary  NUMBER,
    new_salary  NUMBER,
    change_date DATE
);
CREATE OR REPLACE TRIGGER trg_log_salary_change
BEFORE UPDATE OF salary ON employees
FOR EACH ROW
BEGIN
  INSERT INTO salary_log (
    employee_id, old_salary, new_salary, change_date
  ) VALUES (
    :OLD.employee_id, :OLD.salary, :NEW.salary, SYSDATE
  );
  EXCEPTION
  WHEN OTHERS THEN
    RAISE_APPLICATION_ERROR(-20001, 'Error logging salary change: ' || SQLERRM);
END;
/
```



2.Create a row-level trigger to automatically update a salary_log table whenever an employee's salary is changed, and what kind of exceptions should you handle.

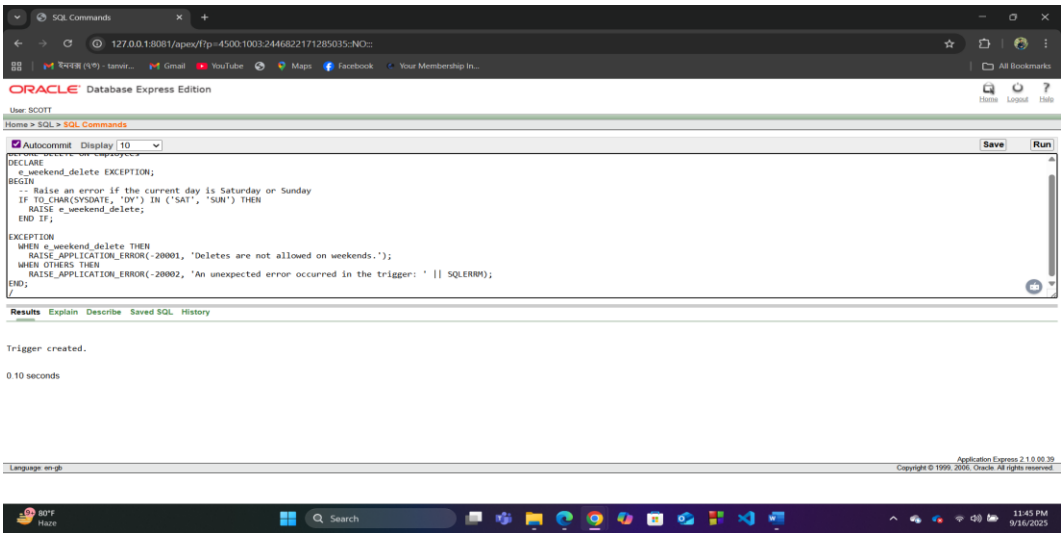
```
CREATE OR REPLACE TRIGGER trg_validate_bill_due_date
BEFORE INSERT OR UPDATE ON Utilities_Bill
FOR EACH ROW
DECLARE
  e_invalid_due_date EXCEPTION;
BEGIN
  IF :NEW.u_due < SYSDATE THEN
    RAISE e_invalid_due_date;
  END IF;
  EXCEPTION
  WHEN e_invalid_due_date THEN
    RAISE_APPLICATION_ERROR(-20002, 'The bill due date cannot be in the past.');
  WHEN OTHERS THEN
    RAISE_APPLICATION_ERROR(-20003, 'An unexpected error occurred in the trigger: ' ||
SQLERRM);
END;
/
```



Statement level trigger

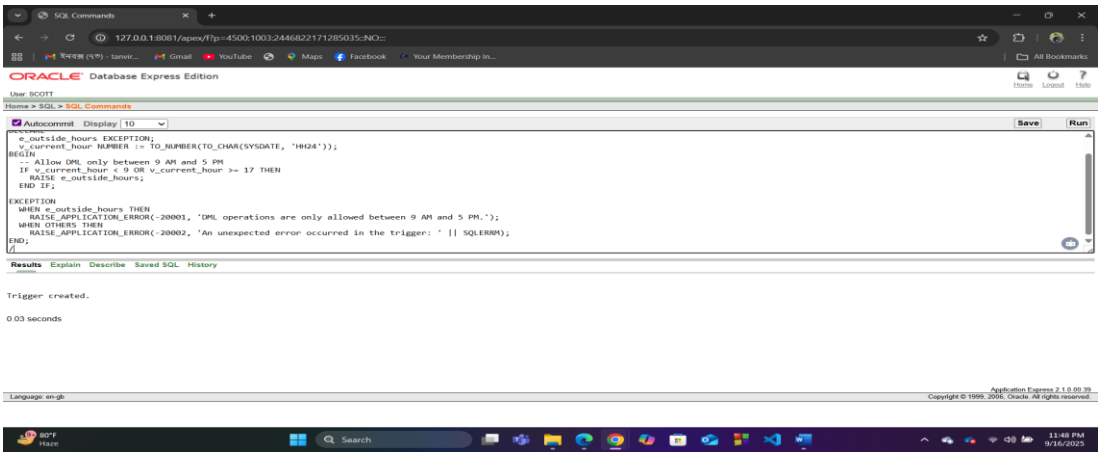
1. Create a statement-level trigger to prevent DELETE operations on a table outside of business hours, and what kind of exceptions should you handle.

```
CREATE OR REPLACE TRIGGER trg_prevent_weekend_delete
BEFORE DELETE ON employees
DECLARE
  e_weekend_delete EXCEPTION;
BEGIN
  IF TO_CHAR(SYSDATE, 'DY') IN ('SAT', 'SUN') THEN
    RAISE e_weekend_delete;
  END IF;
EXCEPTION
  WHEN e_weekend_delete THEN
    RAISE_APPLICATION_ERROR(-20001, 'Deletes are not allowed on weekends.');
  WHEN OTHERS THEN
    RAISE_APPLICATION_ERROR(-20002, 'An unexpected error occurred in the trigger: ' ||
SQLERRM);
END;
/
```



2. Create a statement-level trigger to prevent DELETE operations on a table outside of business hours, and what kind of exceptions should you handle.

```
CREATE OR REPLACE TRIGGER trg_restrict_dml_hours
BEFORE INSERT OR UPDATE OR DELETE ON Laundry_Service
DECLARE
  e_outside_hours EXCEPTION;
  v_current_hour NUMBER := TO_NUMBER(TO_CHAR(SYSDATE, 'HH24'));
BEGIN
  IF v_current_hour < 9 OR v_current_hour >= 17 THEN
    RAISE e_outside_hours;
  END IF;
EXCEPTION
  WHEN e_outside_hours THEN
    RAISE_APPLICATION_ERROR(-20001, 'DML operations are only allowed between 9 AM and 5 PM.');
  WHEN OTHERS THEN
    RAISE_APPLICATION_ERROR(-20002, 'An unexpected error occurred in the trigger: ' || SQLERRM);
END;
/
```

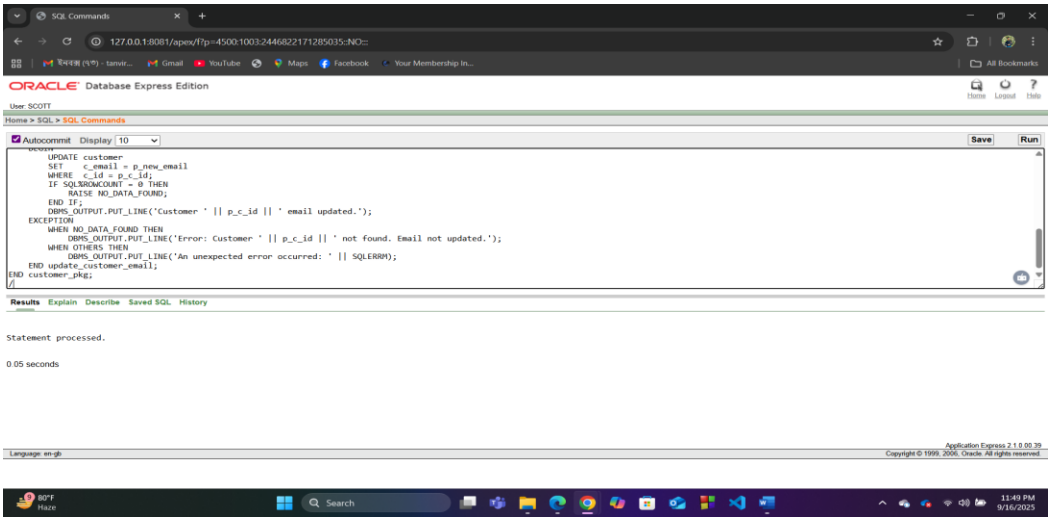


Package

1. Create a PL/SQL package to group related procedures and functions for managing Customers, and how can you centralize their exception handling.

```
CREATE OR REPLACE PACKAGE customer_pkg IS
   FUNCTION get_customer_name(p_c_id IN customer.c_id%TYPE) RETURN VARCHAR2;
   PROCEDURE update_customer_email(p_c_id IN customer.c_id%TYPE, p_new_email IN customer.c_email%TYPE);
END customer_pkg;
/
CREATE OR REPLACE PACKAGE BODY customer_pkg IS
   FUNCTION get_customer_name(p_c_id IN customer.c_id%TYPE) RETURN VARCHAR2 IS
      v_name customer.c_name%TYPE;
   BEGIN
      SELECT c_name
      INTO   v_name
      FROM   customer
      WHERE  c_id = p_c_id;
      RETURN v_name;
   EXCEPTION
      WHEN NO_DATA_FOUND THEN
         DBMS_OUTPUT.PUT_LINE('Error: Customer ' || p_c_id || ' not found.');
         RETURN NULL;
      WHEN OTHERS THEN
         DBMS_OUTPUT.PUT_LINE('An unexpected error occurred: ' || SQLERRM);
         RETURN NULL;
   END get_customer_name;
    PROCEDURE update_customer_email(p_c_id IN customer.c_id%TYPE, p_new_email IN customer.c_email%TYPE) IS
   BEGIN
```

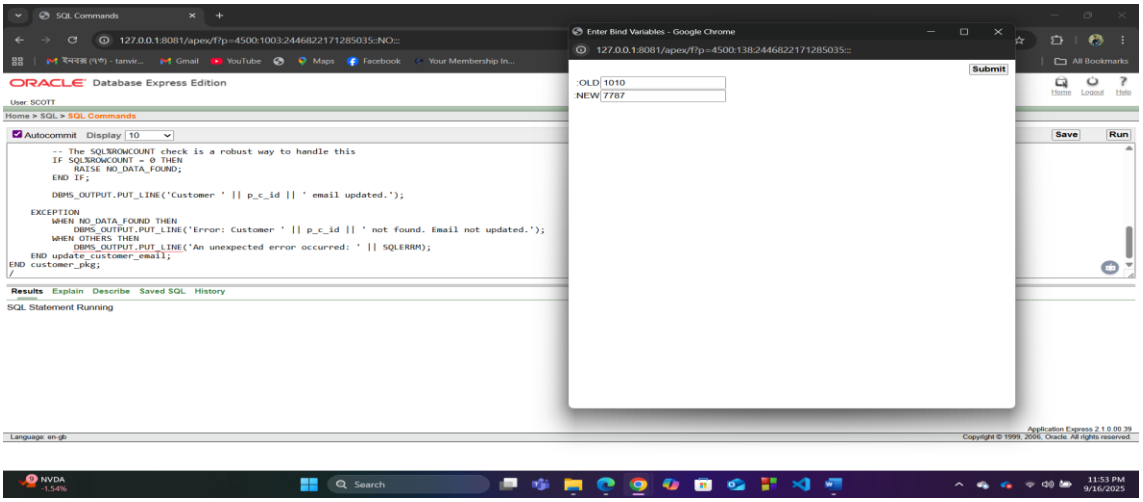
```
    UPDATE customer
    SET    c_email = p_new_email
    WHERE  c_id = p_c_id;
    IF SQL%ROWCOUNT = 0 THEN
      RAISE NO_DATA_FOUND;
    END IF;
    DBMS_OUTPUT.PUT_LINE('Customer ' || p_c_id || ' email updated.');
  EXCEPTION
    WHEN NO_DATA_FOUND THEN
      DBMS_OUTPUT.PUT_LINE('Error: Customer ' || p_c_id || ' not found. Email not updated.');
    WHEN OTHERS THEN
      DBMS_OUTPUT.PUT_LINE('An unexpected error occurred: ' || SQLERRM);
  END update_customer_email;
END customer_pkg;
/
```



2. Get_customer_name function and update_customer_email procedure in a PL/SQL package using different programming constructs.

```
CREATE OR REPLACE PACKAGE customer_pkg IS
  FUNCTION get_customer_name(p_c_id IN customer.c_id%TYPE) RETURN VARCHAR2;
  PROCEDURE update_customer_email(p_c_id IN customer.c_id%TYPE, p_new_email IN customer.c_email%TYPE);
END customer_pkg;
/
CREATE OR REPLACE PACKAGE BODY customer_pkg IS
  FUNCTION get_customer_name(p_c_id IN customer.c_id%TYPE) RETURN VARCHAR2 IS
```

```
    v_name customer.c_name%TYPE := NULL;
  BEGIN
    FOR rec IN (
      SELECT c_name
      FROM   customer
      WHERE  c_id = p_c_id
    ) LOOP
      v_name := rec.c_name;
    END LOOP;
    RETURN v_name;
EXCEPTION
    WHEN OTHERS THEN
      DBMS_OUTPUT.PUT_LINE('An unexpected error occurred: ' || SQLERRM);
      RETURN NULL;
  END get_customer_name;
  PROCEDURE update_customer_email(p_c_id IN customer.c_id%TYPE, p_new_email IN
customer.c_email%TYPE) IS
  BEGIN
    UPDATE customer
    SET    c_email = p_new_email
    WHERE  c_id = p_c_id;
          IF SQL%ROWCOUNT = 0 THEN
      RAISE NO_DATA_FOUND;
    END IF;
     DBMS_OUTPUT.PUT_LINE('Customer ' || p_c_id || ' email updated.');
  EXCEPTION
    WHEN NO_DATA_FOUND THEN
      DBMS_OUTPUT.PUT_LINE('Error: Customer ' || p_c_id || ' not found. Email not
updated.');
    WHEN OTHERS THEN
      DBMS_OUTPUT.PUT_LINE('An unexpected error occurred: ' || SQLERRM);
  END update_customer_email;
END customer_pkg;
/
```



Relational Algebra:

Question 1: Find the first and last names of customers whose first name is "John".

Answer:

$$\Pi_{first\_name,\ last\_name}\ (\sigma_{first\_name\ =\ "John"}\ (Customer))$$

Question 2: Find the email addresses of all customers with a last name of "Smith".

Answer:

$$\Pi_{email}\ (\sigma_{last\_name\ =\ "Smith"}\ (Customer))$$

Question-3: Find the names of all laundry services that cost more than $5.00.

Answer:

$$\Pi_{service\_name}\ (\sigma_{price\ >\ 5.00}\ (Laundry\_Service))$$

Question-3: Find job titles all employees who have a salary greater than $40,000.

Answer:

$$\Pi_{job\_title}\ (\sigma_{salary\ >\ 40000}\ (Employee))$$

Question 4: Find the details of employees whose first name is "David".

Answer:

$$\Pi_{employee\_id,\ first\_name,\ last\_name,\ job\_title,\ hire\_date,\ salary}\ (\sigma_{first\_name\ =\ "David"}\ (Employee))$$

Question -5: Find the names and prices of all laundry services that cost less than or equal to $2.50.

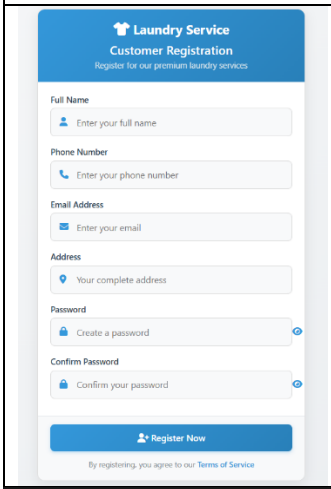
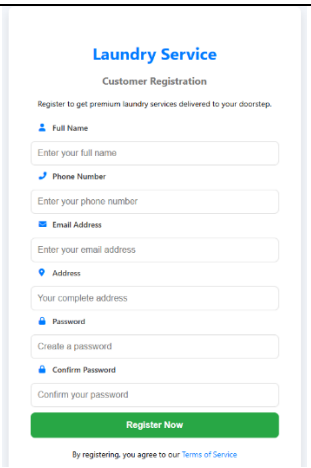
Answer:

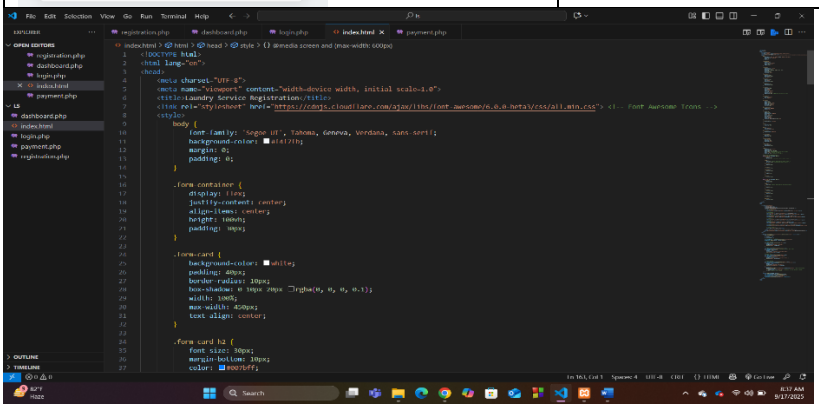
$$\prod service\_name, price \ (\sigma \ price \leq 2.50 \ (Laundry\_Service))$$

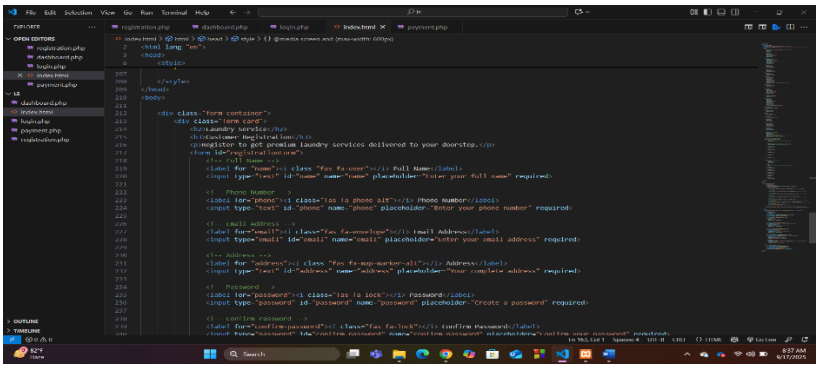
Bonus

1.User interface & code:

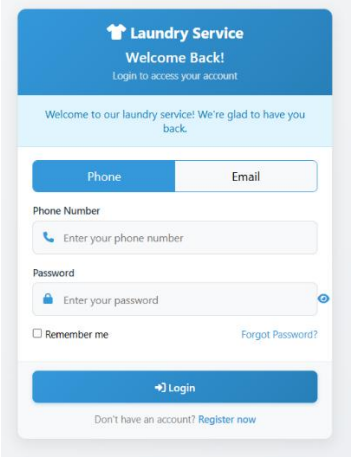
Registration:

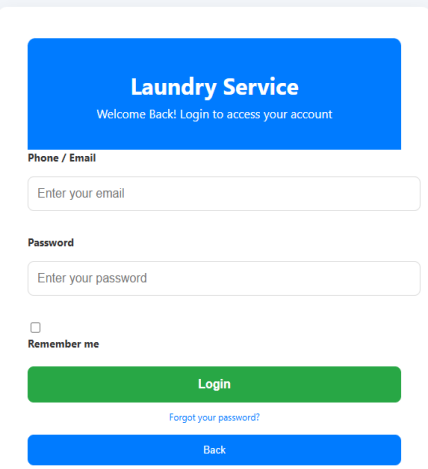
Mid Interface	Final Interface
	

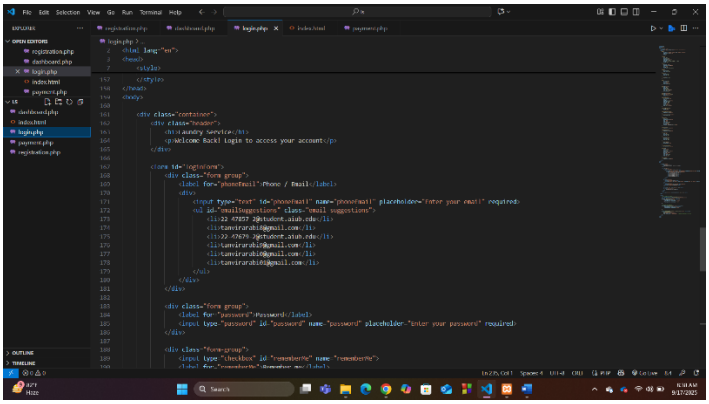


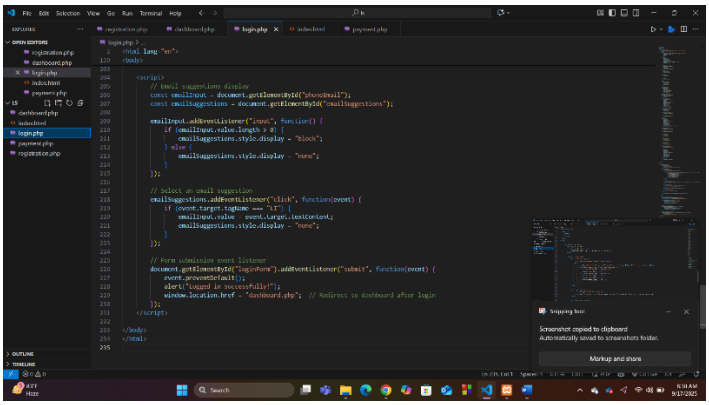


Login:

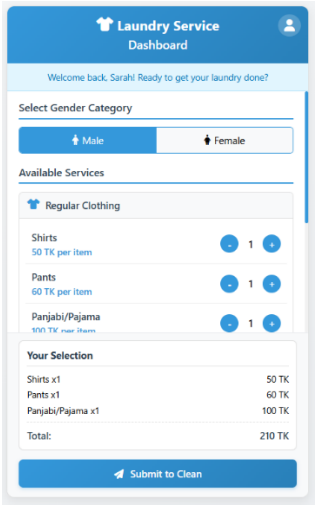

Laundry Service
Welcome Back!
Login to access your account
Welcome to our laundry service! We're glad to have you back.
Phone
Email
Phone Number
Enter your phone number
Password
Enter your password
Remember me
Forgot Password?
Login
Don't have an account? Register now

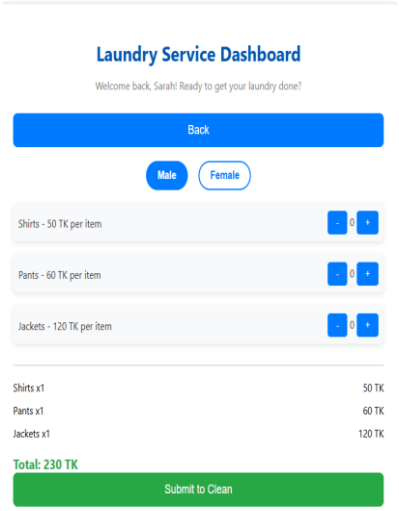

Laundry Service
Welcome Back! Login to access your account
Phone / Email
Enter your email
Password
Enter your password
Remember me
Login
Forgot your password?
Back

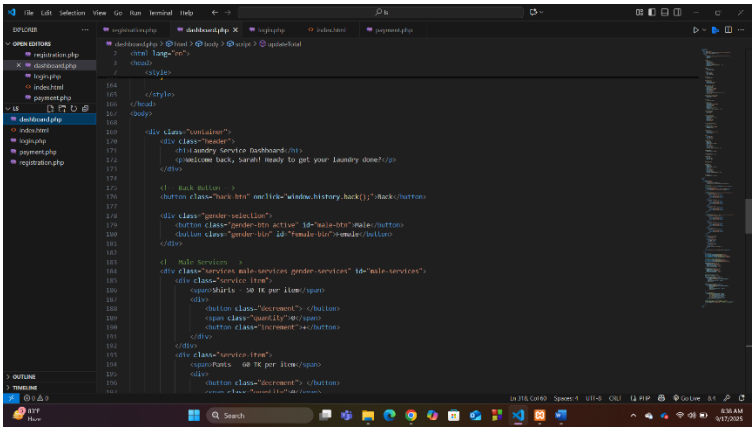


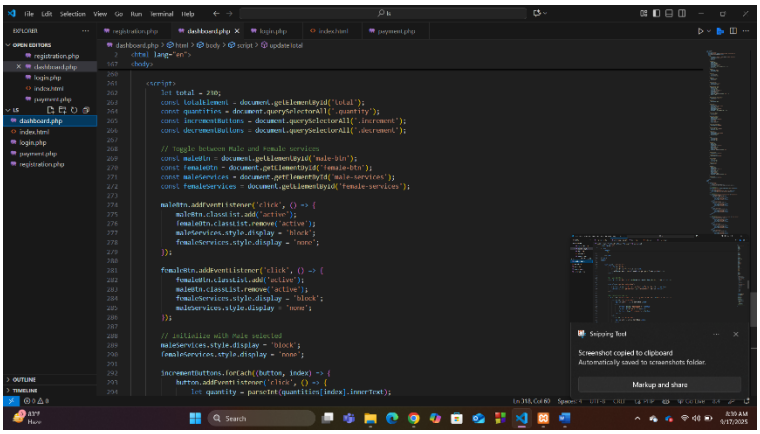


Dashboard:

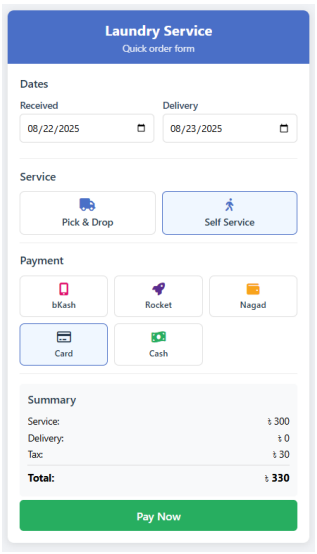

Laundry Service
Dashboard
Welcome back, Sarah! Ready to get your laundry done?
Select Gender Category
Male
Female
Available Services
Regular Clothing
Shirts
50 TK per item
1
Pants
60 TK per item
1
Panjabi/Pajama
1
Your Selection
Shirts x1
50 TK
Pants x1
60 TK
Panjabi/Pajama x1
100 TK
Total:
210 TK
Submit to Clean

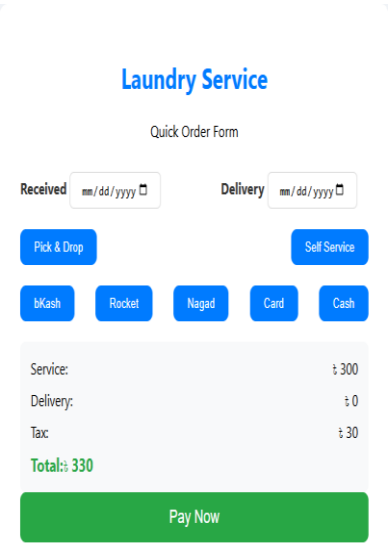

Laundry Service Dashboard
Welcome back, Sarah! Ready to get your laundry done?
Back
Male
Female
Shirts - 50 TK per item
Pants - 60 TK per item
Jackets - 120 TK per item
Shirts x1
50 TK
Pants x1
60 TK
Jackets x1
120 TK
Total: 230 TK
Submit to Clean





Payment:


Laundry Service
Quick order form
Dates
Received
Delivery
08/22/2025
08/23/2025
Service
Pick & Drop
Self Service
Payment
bKash
Rocket
Nagad
Card
Cash
Summary
Service: ৳ 300
Delivery: ৳ 0
Tax: ৳ 30
Total: ৳ 330
Pay Now


Laundry Service
Quick Order Form
Received mm/dd/yyyy
Delivery mm/dd/yyyy
Pick & Drop
Self Service
bKash
Rocket
Nagad
Card
Cash
Service: ৳ 300
Delivery: ৳ 0
Tax: ৳ 30
Total:৳ 330
Pay Now