Exercise 1: Control Structures

Scenario 1: The bank wants to apply a discount to loan interest rates for customers above 60 years old.

- **Question:** Write a PL/SQL block that loops through all customers, checks their age, and if they are above 60, apply a 1% discount to their current loan interest rates.

Scenario 2: A customer can be promoted to VIP status based on their balance.

- **Question:** Write a PL/SQL block that iterates through all customers and sets a flag IsVIP to TRUE for those with a balance over $10,000.

Scenario 3: The bank wants to send reminders to customers whose loans are due within the next 30 days.

- **Question:** Write a PL/SQL block that fetches all loans due in the next 30 days and prints a reminder message for each customer.

Schema

```
CREATE TABLE Customers (
    CustomerID NUMBER PRIMARY KEY,
    Name VARCHAR2(100),
    DOB DATE,
    Balance NUMBER,
    LastModified DATE
);

CREATE TABLE Accounts (
    AccountID NUMBER PRIMARY KEY,
    CustomerID NUMBER,
    AccountType VARCHAR2(20),
    Balance NUMBER,
    LastModified DATE,
    FOREIGN KEY (CustomerID) REFERENCES Customers(CustomerID)
);

CREATE TABLE Transactions (
    TransactionID NUMBER PRIMARY KEY,
    AccountID NUMBER,
    TransactionDate DATE,
    Amount NUMBER,
    TransactionType VARCHAR2(10),
    FOREIGN KEY (AccountID) REFERENCES Accounts(AccountID)
);
```

```
CREATE TABLE Loans (
   LoanID NUMBER PRIMARY KEY,
   CustomerID NUMBER,
   LoanAmount NUMBER,
   InterestRate NUMBER,
   StartDate DATE,
   EndDate DATE,
   FOREIGN KEY (CustomerID) REFERENCES Customers(CustomerID)
);

CREATE TABLE Employees (
   EmployeeID NUMBER PRIMARY KEY,
   Name VARCHAR2(100),
   Position VARCHAR2(50),
   Salary NUMBER,
   Department VARCHAR2(50),
   HireDate DATE
);
```

DATA

```
INSERT INTO Customers (CustomerID, Name, DOB, Balance, LastModified)
VALUES (1, 'John Doe', TO_DATE('1985-05-15', 'YYYY-MM-DD'), 1000, SYSDATE);

INSERT INTO Customers (CustomerID, Name, DOB, Balance, LastModified)
VALUES (2, 'Jane Smith', TO_DATE('1990-07-20', 'YYYY-MM-DD'), 1500, SYSDATE);

INSERT INTO Accounts (AccountID, CustomerID, AccountType, Balance, LastModified)
VALUES (1, 1, 'Savings', 1000, SYSDATE);

INSERT INTO Accounts (AccountID, CustomerID, AccountType, Balance, LastModified)
VALUES (2, 2, 'Checking', 1500, SYSDATE);

INSERT INTO Transactions (TransactionID, AccountID, TransactionDate, Amount, TransactionType)
VALUES (1, 1, SYSDATE, 200, 'Deposit');

INSERT INTO Transactions (TransactionID, AccountID, TransactionDate, Amount, TransactionType)
VALUES (2, 2, SYSDATE, 300, 'Withdrawal');

INSERT INTO Loans (LoanID, CustomerID, LoanAmount, InterestRate, StartDate, EndDate)
VALUES (1, 1, 5000, 5, SYSDATE, ADD_MONTHS(SYSDATE, 60));

INSERT INTO Employees (EmployeeID, Name, Position, Salary, Department, HireDate)
VALUES (1, 'Alice Johnson', 'Manager', 70000, 'HR', TO_DATE('2015-06-15', 'YYYY-MM-DD'));
```

```
INSERT INTO Employees (EmployeeID, Name, Position, Salary, Department, HireDate)
VALUES (2, 'Bob Brown', 'Developer', 60000, 'IT', TO_DATE('2017-03-20', 'YYYY-MM-DD'));

INSERT INTO Customers (CustomerID, Name, DOB, Balance, LastModified)
VALUES (3, 'Senior Citizen', TO_DATE('1950-01-01', 'YYYY-MM-DD'), 9000, SYSDATE);


INSERT INTO Loans (LoanID, CustomerID, LoanAmount, InterestRate, StartDate, EndDate)
VALUES (2, 3, 7000, 6, SYSDATE, ADD_MONTHS(SYSDATE, 36));

INSERT INTO Customers (CustomerID, Name, DOB, Balance, LastModified)
VALUES (4, 'Swetha VIP', TO_DATE('1980-01-01', 'YYYY-MM-DD'), 20000, SYSDATE);

INSERT INTO Loans (LoanID, CustomerID, LoanAmount, InterestRate, StartDate, EndDate)
VALUES (3, 2, 6000, 6.5, SYSDATE, SYSDATE + 10);

ALTER TABLE Customers ADD IsVIP VARCHAR2(5);
```

Scenario 1:

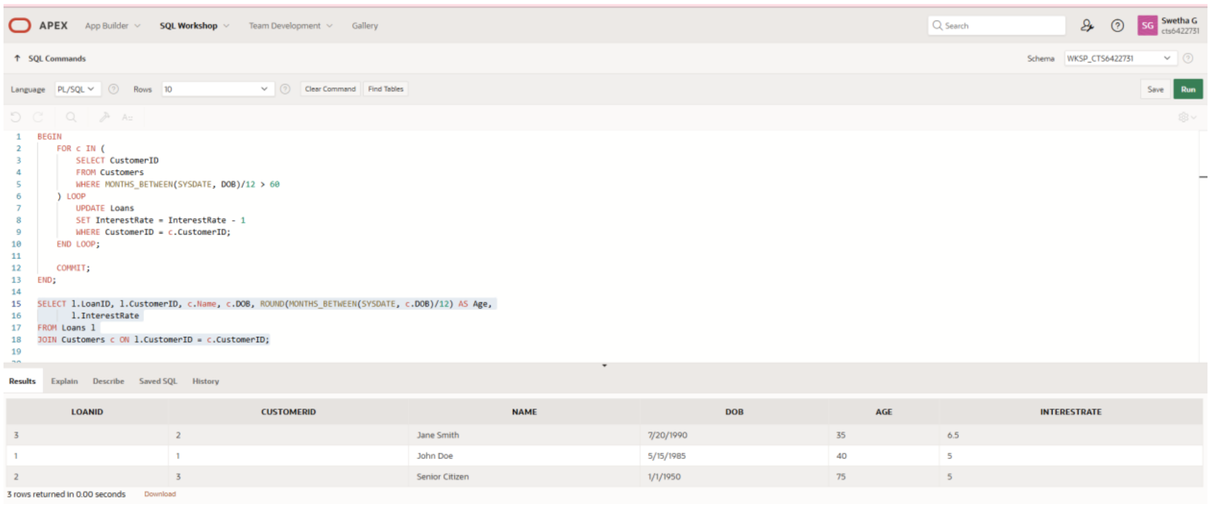
Code:

```
BEGIN
  FOR c IN (
    SELECT CustomerID
    FROM Customers
    WHERE MONTHS_BETWEEN(SYSDATE, DOB)/12 > 60
  ) LOOP
    UPDATE Loans
    SET InterestRate = InterestRate - 1
    WHERE CustomerID = c.CustomerID;
  END LOOP;


  COMMIT;
END;


SELECT l.LoanID, l.CustomerID, c.Name, c.DOB, ROUND(MONTHS_BETWEEN(SYSDATE, c.DOB)/12)
AS Age,
    l.InterestRate
FROM Loans l
JOIN Customers c ON l.CustomerID = c.CustomerID;
```

OUTPUT:



```
BEGIN
    FOR c IN (
        SELECT CustomerID
        FROM Customers
        WHERE MONTHS_BETWEEN(SYSDATE, DOB)/12 > 60
    ) LOOP
        UPDATE Loans
        SET InterestRate = InterestRate - 1
        WHERE CustomerID = c.CustomerID;
    END LOOP;

    COMMIT;
END;

SELECT l.LoanID, l.CustomerID, c.Name, c.DOB, ROUND(MONTHS_BETWEEN(SYSDATE, c.DOB)/12) AS Age,
        l.InterestRate
FROM Loans l
JOIN Customers c ON l.CustomerID = c.CustomerID;
```

LOANID	CUSTOMERID	NAME	DOB	AGE	INTERESTRATE
3	2	Jane Smith	7/20/1990	35	6.5
1	1	John Doe	5/15/1985	40	5
2	3	Senior Citizen	1/1/1950	75	5

3 rows returned in 0.00 seconds Download

Scenario 2:

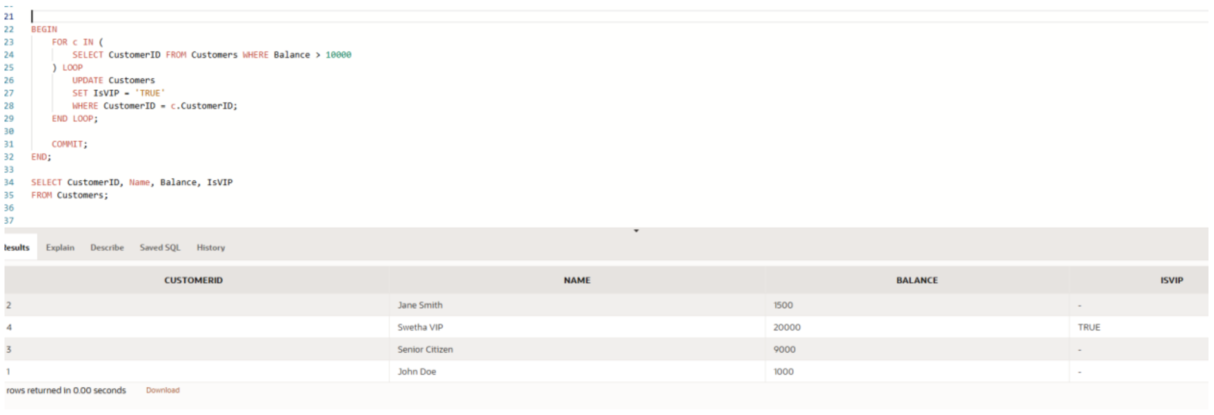
Code:

```
BEGIN
    FOR c IN (
        SELECT CustomerID FROM Customers WHERE Balance > 10000
    ) LOOP
        UPDATE Customers
        SET IsVIP = 'TRUE'
        WHERE CustomerID = c.CustomerID;
    END LOOP;

    COMMIT;
END;

SELECT CustomerID, Name, Balance, IsVIP
FROM Customers;
```

OUTPUT:



```
BEGIN
    FOR c IN (
        SELECT CustomerID FROM Customers WHERE Balance > 10000
    ) LOOP
        UPDATE Customers
        SET IsVIP = 'TRUE'
        WHERE CustomerID = c.CustomerID;
    END LOOP;

    COMMIT;
END;

SELECT CustomerID, Name, Balance, IsVIP
FROM Customers;
```

CUSTOMERID	NAME	BALANCE	ISVIP
2	Jane Smith	1500	-
4	Swetha VIP	20000	TRUE
3	Senior Citizen	9000	-
1	John Doe	1000	-

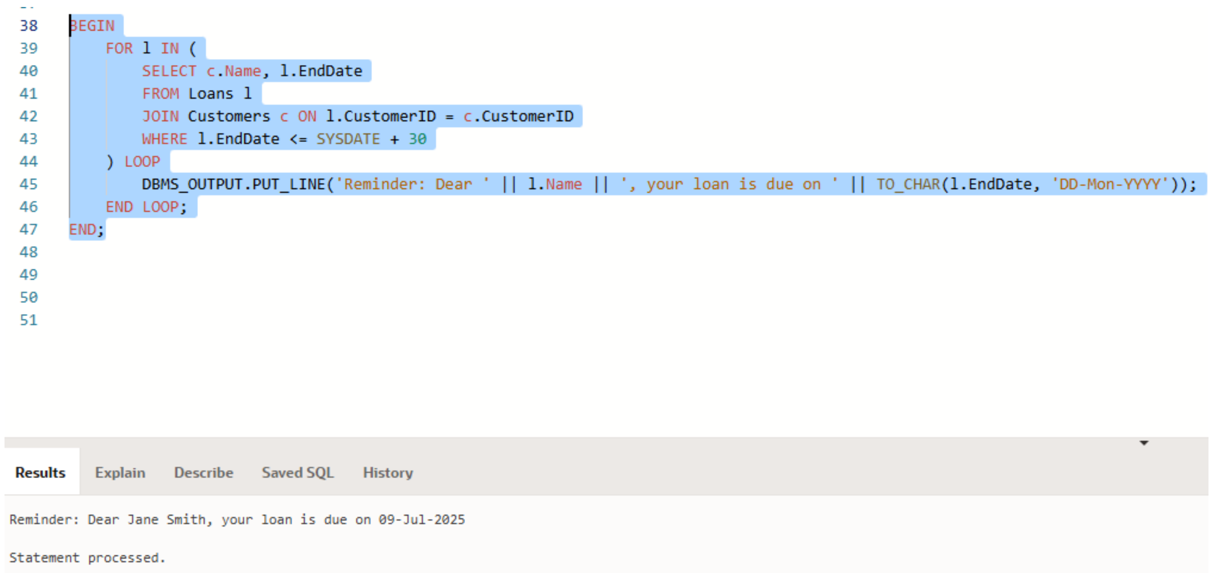
rows returned in 0.00 seconds   Download

Scenario 3:

Code:

```
BEGIN
    FOR l IN (
        SELECT c.Name, l.EndDate
        FROM Loans l
        JOIN Customers c ON l.CustomerID = c.CustomerID
        WHERE l.EndDate <= SYSDATE + 30
    ) LOOP
        DBMS_OUTPUT.PUT_LINE('Reminder: Dear ' || l.Name || ', your loan is due on ' || TO_CHAR(l.EndDate, 
'DD-Mon-YYYY'));
    END LOOP;
END;
```

OUTPUT:



```
BEGIN
    FOR l IN (
        SELECT c.Name, l.EndDate
        FROM Loans l
        JOIN Customers c ON l.CustomerID = c.CustomerID
        WHERE l.EndDate <= SYSDATE + 30
    ) LOOP
        DBMS_OUTPUT.PUT_LINE('Reminder: Dear ' || l.Name || ', your loan is due on ' || TO_CHAR(l.EndDate, 'DD-Mon-YYYY'));
    END LOOP;
END;
```

```
Reminder: Dear Jane Smith, your loan is due on 09-Jul-2025

Statement processed.
```