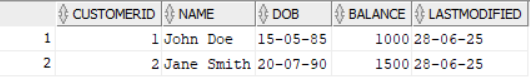
**Week – 2**

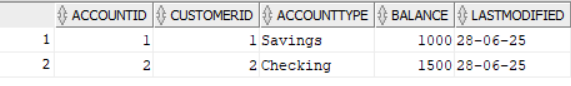
**Module – 3 PL/SQL Programming**

**I have created the following five tables: CustomersTable, AccountsTable, TransactionsTable, LoansTable, and EmployeesTable, as per the given schema and inserted the sample records into them.**

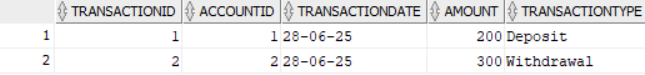
**CustomersTable**

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**AccountsTable**

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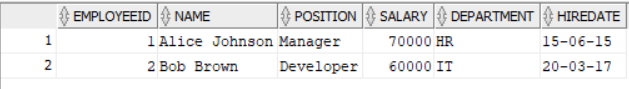
**TransactionsTable**

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**LoansTable**

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**EmployeesTable**

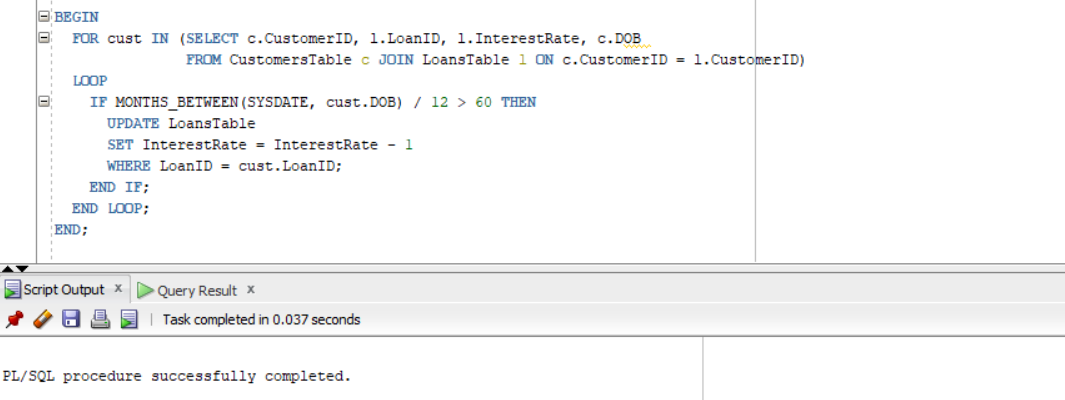
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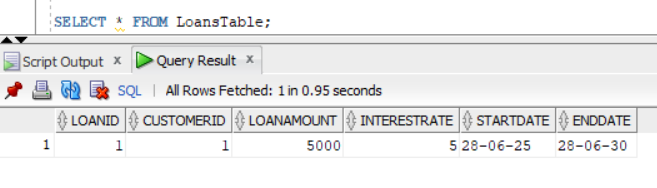
**Exercise 1: Control Structures (Mandatory Exercise)**

**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.



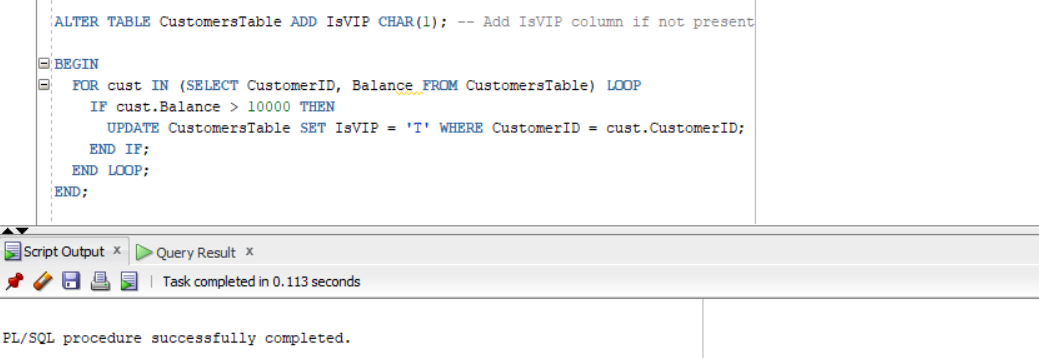


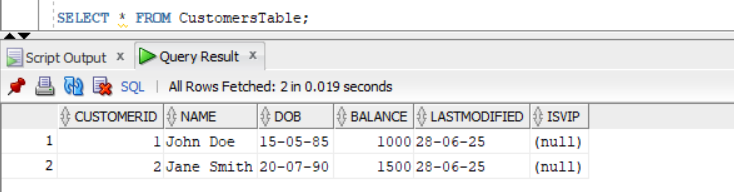
\*We have only two customers and both of the customer’s age is not above 60 and so no updation is made in the CustomersTable.

**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.



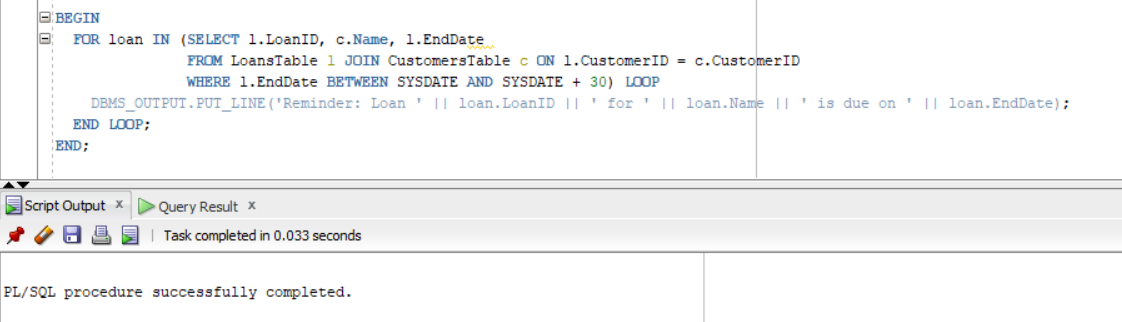


\*None of the customer’s balance is greater than 10000, so no updation is made in the CustomersTable.

**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.

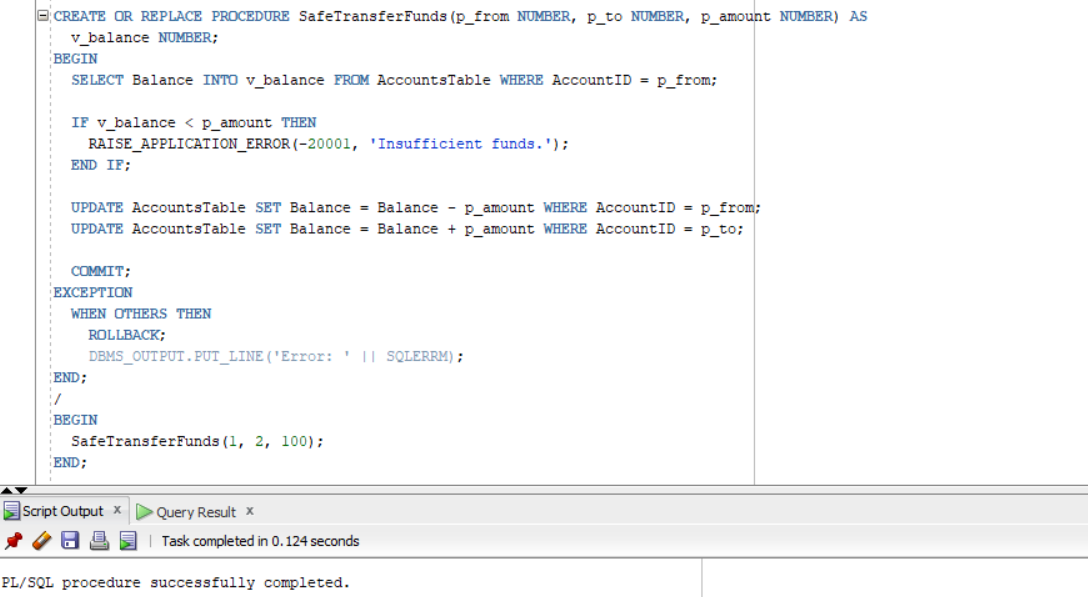


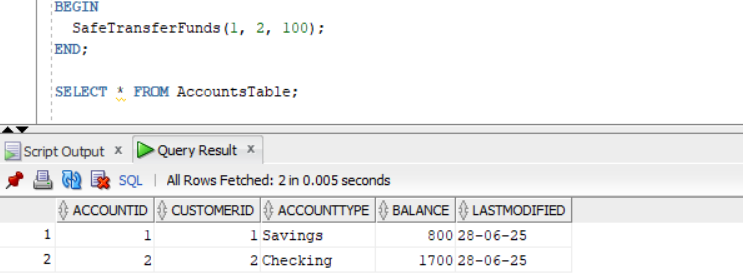
**Exercise 2: Error Handling (Additional Exercise)**

**Scenario 1:**

**Handle exceptions during fund transfers between accounts.**

* + **Question:** Write a stored procedure **SafeTransferFunds** that transfers funds between two accounts. Ensure that if any error occurs (e.g., insufficient funds), an appropriate error message is logged and the transaction is rolled back.

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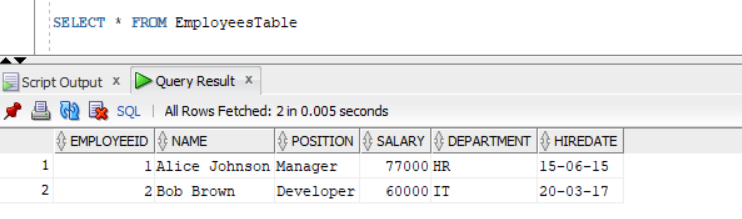
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**Scenario 2:**

**Manage errors when updating employee salaries.**

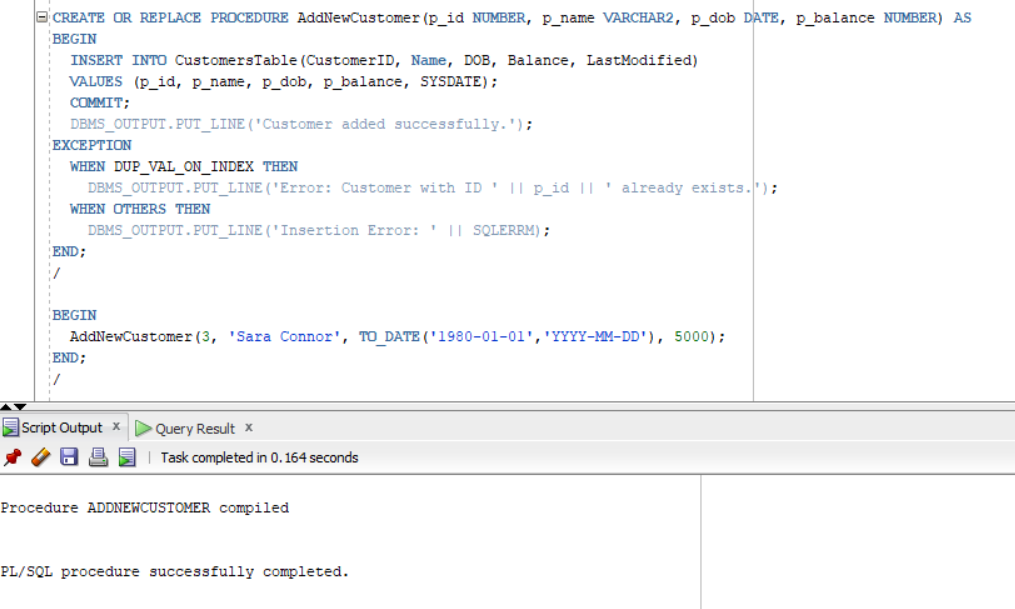
* + **Question:** Write a stored procedure **UpdateSalary** that increases the salary of an employee by a given percentage. If the employee ID does not exist, handle the exception and log an error message.

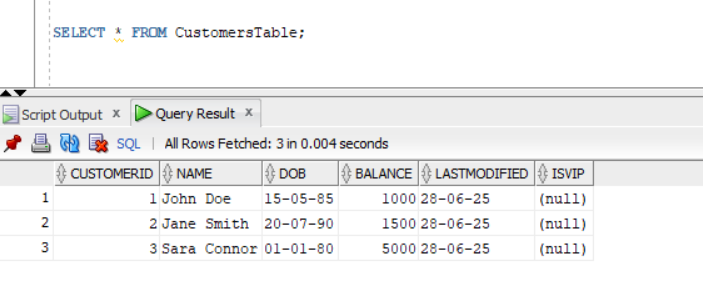




**Scenario 3:** Ensure data integrity when adding a new customer.

* + **Question:** Write a stored procedure **AddNewCustomer** that inserts a new customer into the Customers table. If a customer with the same ID already exists, handle the exception by logging an error and preventing the insertion.



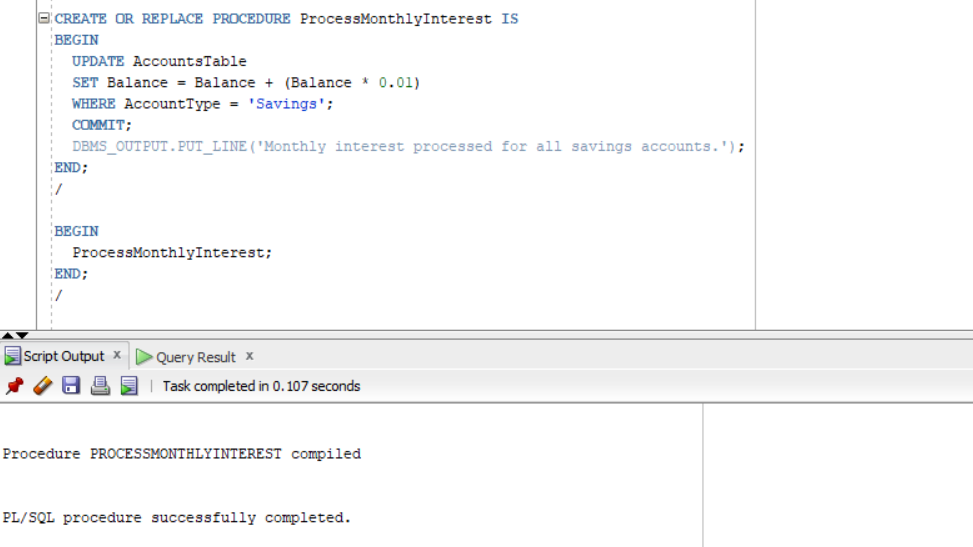


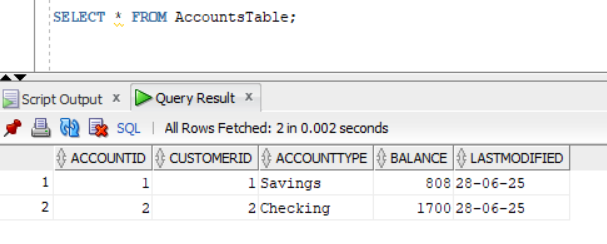
**Exercise 3: Stored Procedures (Mandatory Exercise)**

**Scenario 1:**

**The bank needs to process monthly interest for all savings accounts.**

* + **Question:** Write a stored procedure **ProcessMonthlyInterest** that calculates and updates the balance of all savings accounts by applying an interest rate of 1% to the current balance.

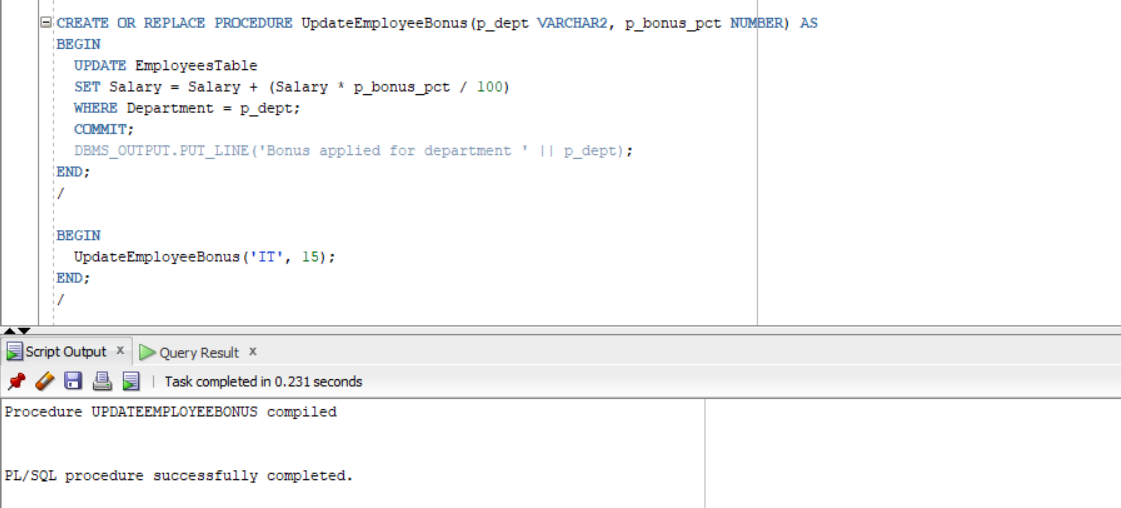




**Scenario 2:**

**The bank wants to implement a bonus scheme for employees based on their performance.**

* + **Question:** Write a stored procedure **UpdateEmployeeBonus** that updates the salary of employees in a given department by adding a bonus percentage passed as a parameter.

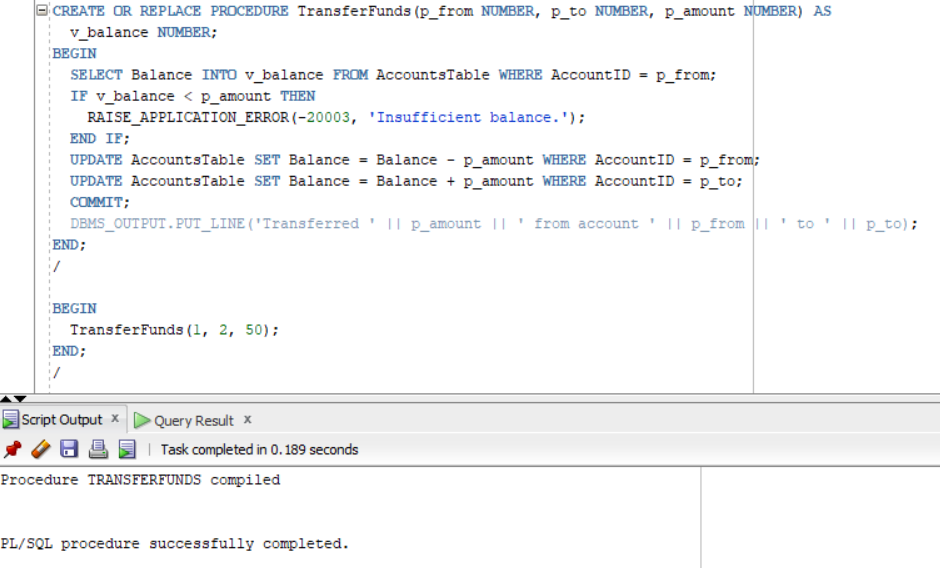


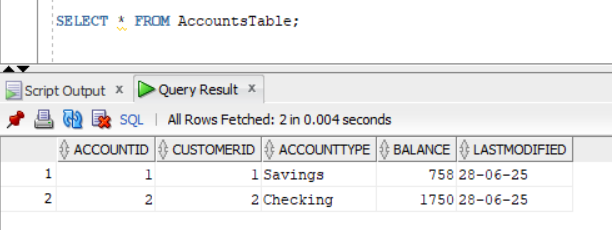


**Scenario 3:**

**Customers should be able to transfer funds between their accounts.**

* + **Question:** Write a stored procedure **TransferFunds** that transfers a specified amount from one account to another, checking that the source account has sufficient balance before making the transfer.



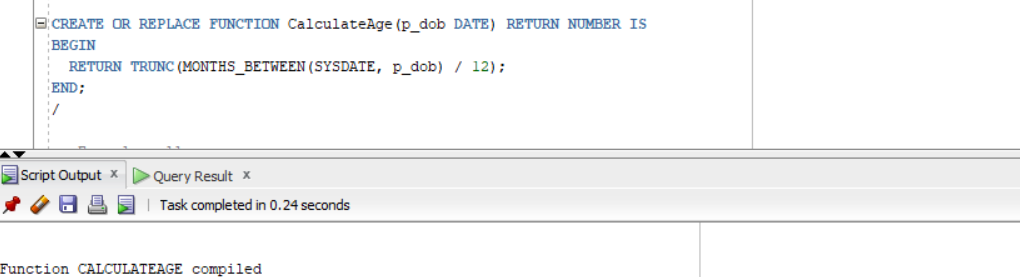


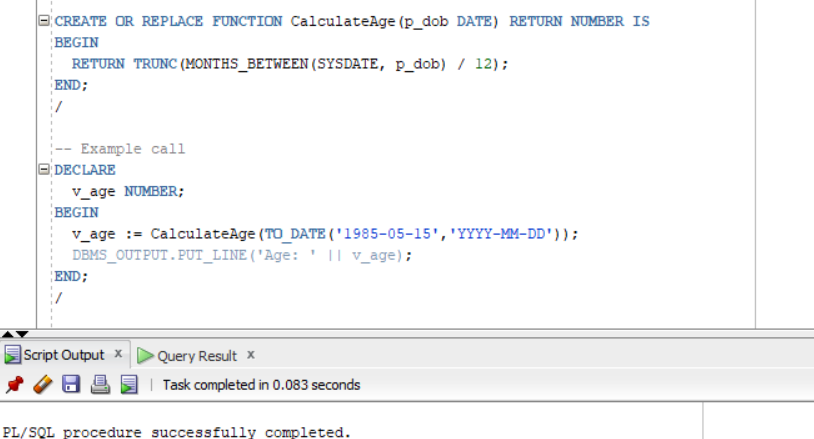
**Exercise 4: Functions (Additional Exercise)**

**Scenario 1:**

**Calculate the age of customers for eligibility checks.**

* + **Question:** Write a function CalculateAge that takes a customer's date of birth as input and returns their age in years.

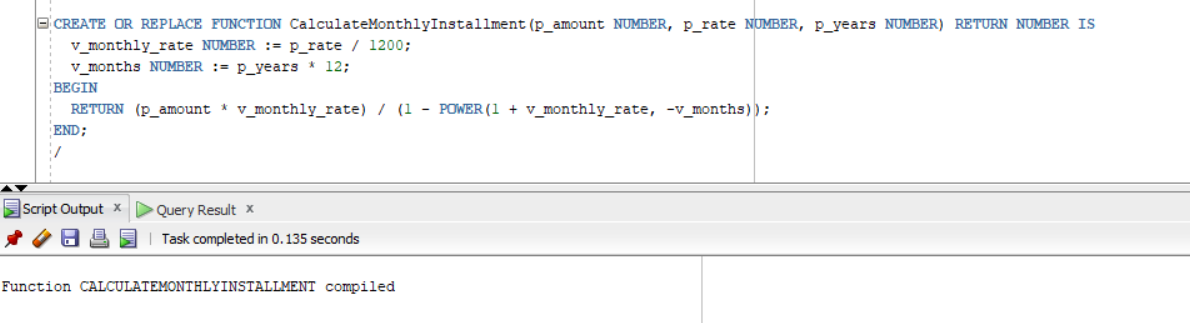


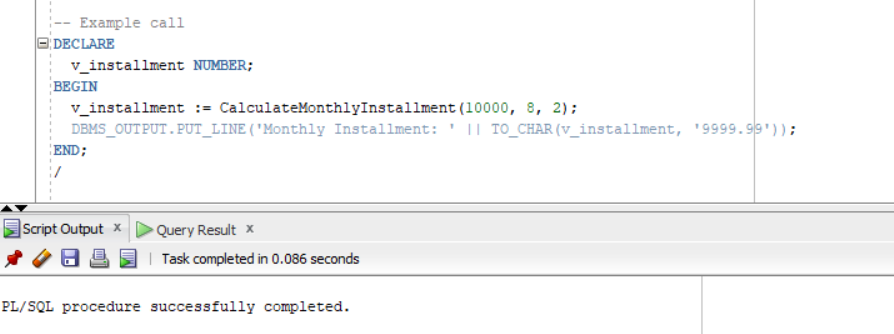


**Scenario 2:**

**The bank needs to compute the monthly installment for a loan.**

* + **Question:** Write a function **CalculateMonthlyInstallment** that takes the loan amount, interest rate, and loan duration in years as input and returns the monthly installment amount.

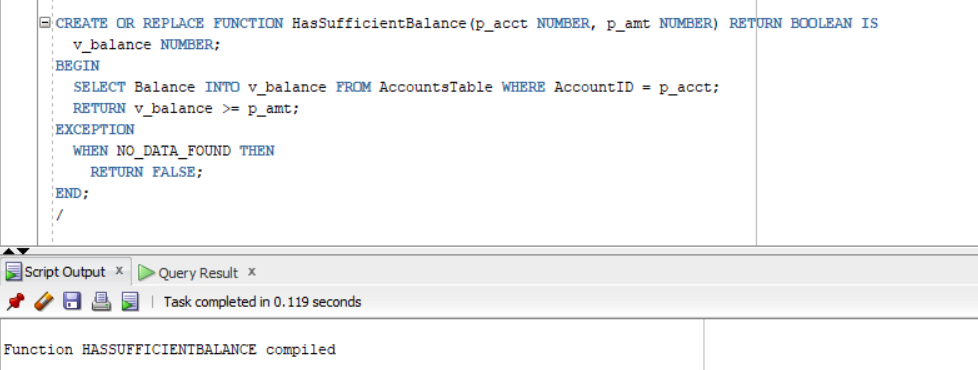


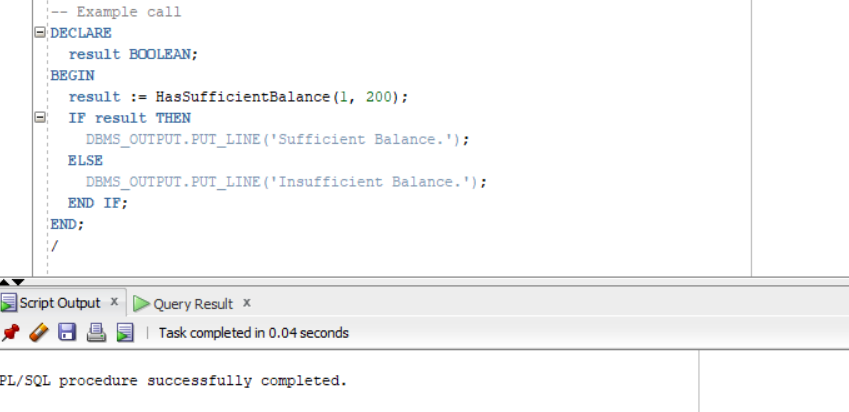


**Scenario 3:**

**Check if a customer has sufficient balance before making a transaction.**

* + **Question:** Write a function **HasSufficientBalance** that takes an account ID and an amount as input and returns a boolean indicating whether the account has at least the specified amount.

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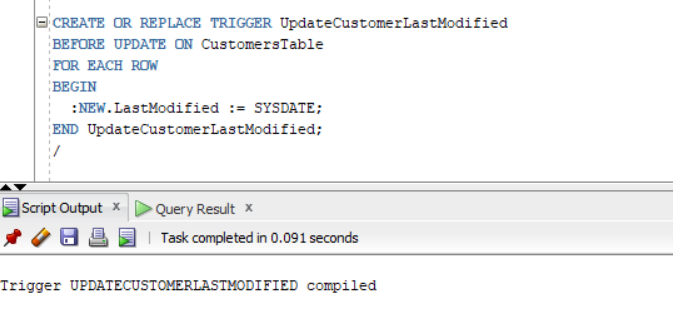
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**Exercise 5: Triggers (Additional Exercise)**

**Scenario 1:**

**Automatically update the last modified date when a customer's record is updated.**

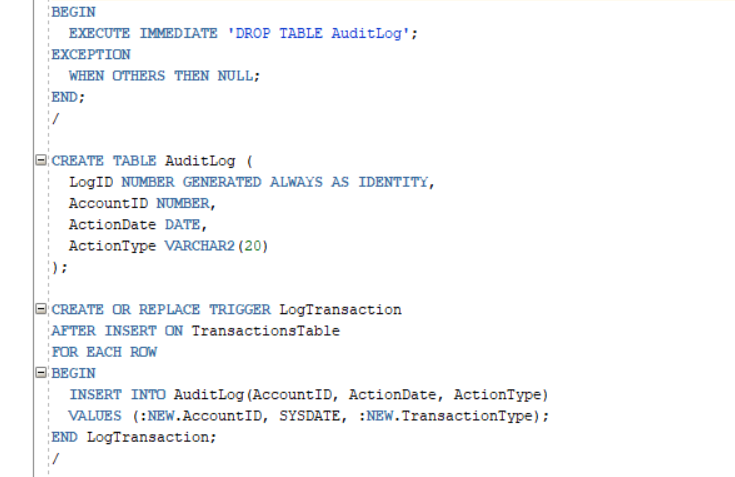
* + **Question:** Write a trigger **UpdateCustomerLastModified** that updates the LastModified column of the Customers table to the current date whenever a customer's record is updated.



**Scenario 2:**

**Maintain an audit log for all transactions.**

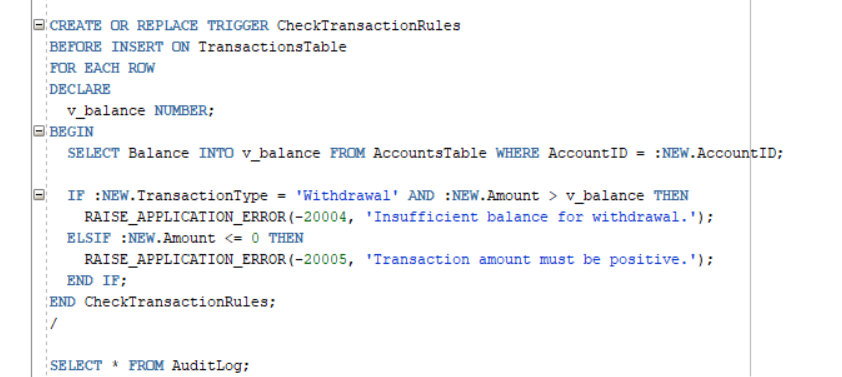
* + **Question:** Write a trigger **LogTransaction** that inserts a record into an AuditLog table whenever a transaction is inserted into the Transactions table.



**Scenario 3:**

**Enforce business rules on deposits and withdrawals.**

* + **Question:** Write a trigger **CheckTransactionRules** that ensures withdrawals do not exceed the balance and deposits are positive before inserting a record into the Transactions table.

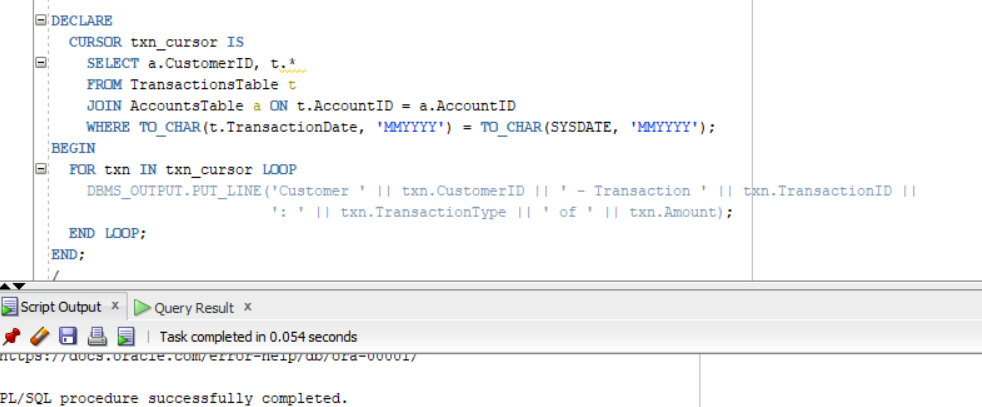
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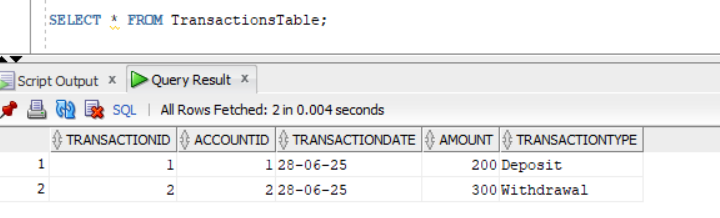
**Exercise 6: Cursors (Additional Exercise)**

**Scenario 1:**

**Generate monthly statements for all customers.**

* + **Question:** Write a PL/SQL block using an explicit cursor **GenerateMonthlyStatements** that retrieves all transactions for the current month and prints a statement for each customer.

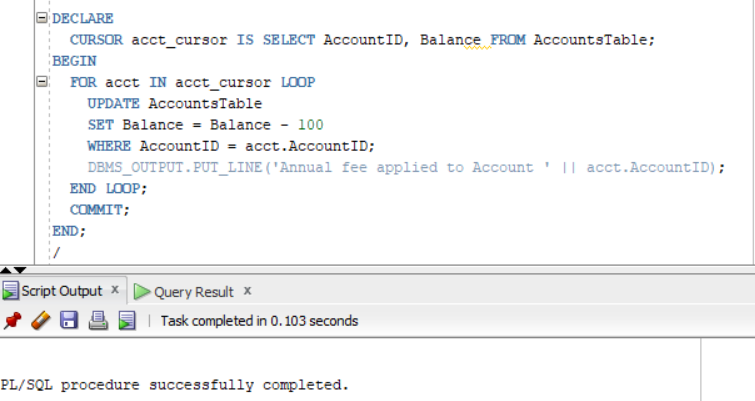


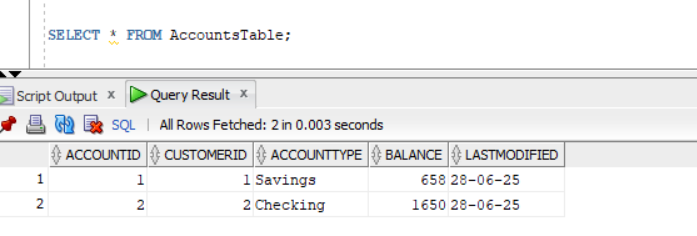


**Scenario 2:**

**Apply annual fee to all accounts.**

* + **Question:** Write a PL/SQL block using an explicit cursor **ApplyAnnualFee** that deducts an annual maintenance fee from the balance of all accounts.

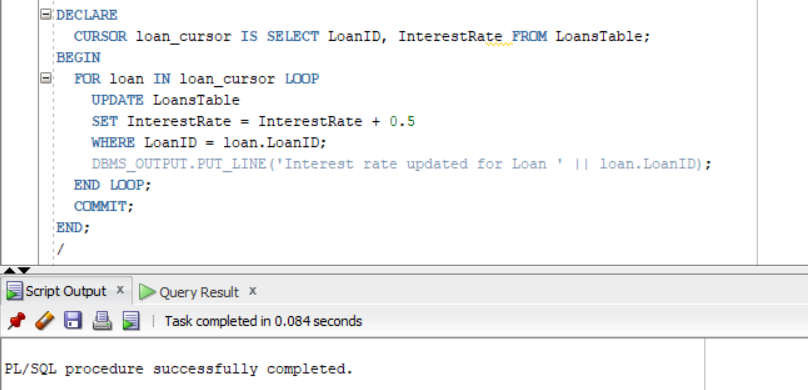


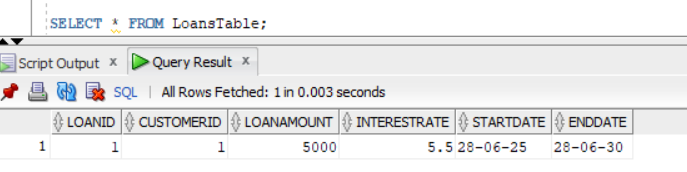


**Scenario 3:**

**Update the interest rate for all loans based on a new policy.**

* + **Question:** Write a PL/SQL block using an explicit cursor **UpdateLoanInterestRates** that fetches all loans and updates their interest rates based on the new policy.

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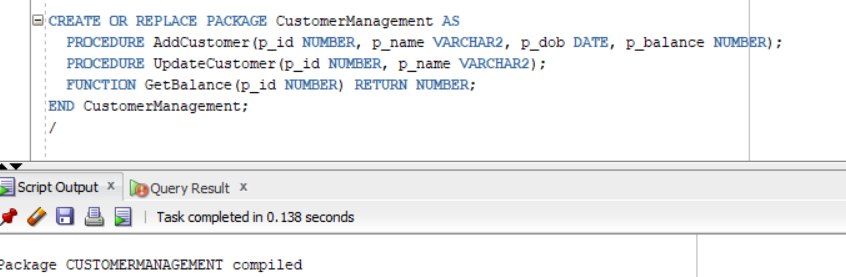
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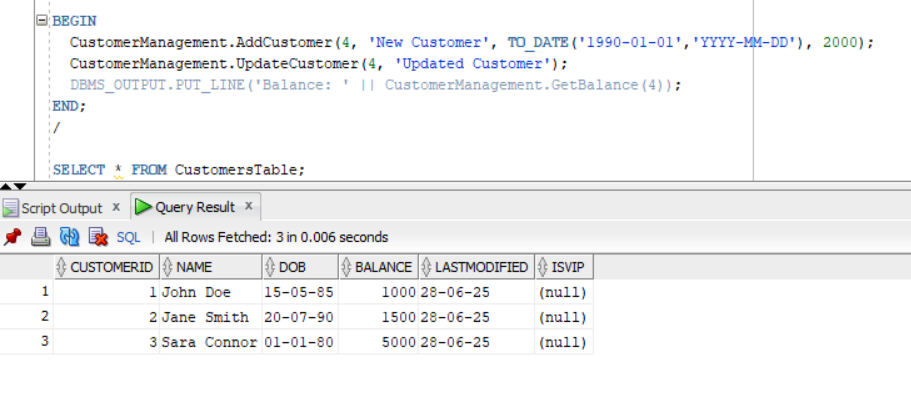
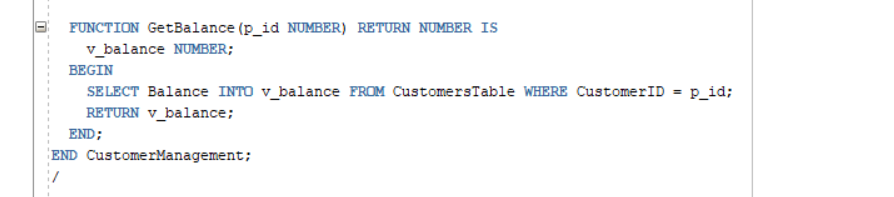
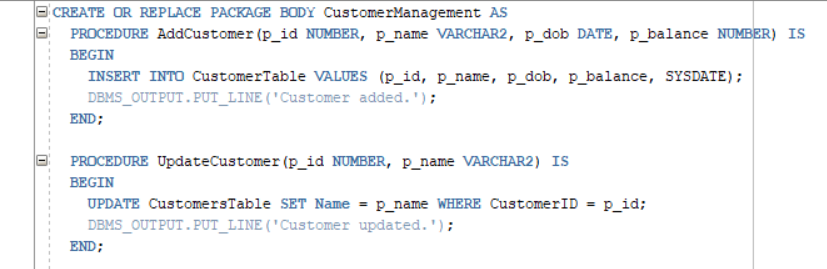
**Exercise 7: Packages (Additional Exercise)**

**Scenario 1:**

**Group all customer-related procedures and functions into a package.**

* + **Question:** Create a package **CustomerManagement** with procedures for adding a new customer, updating customer details, and a function to get customer balance.

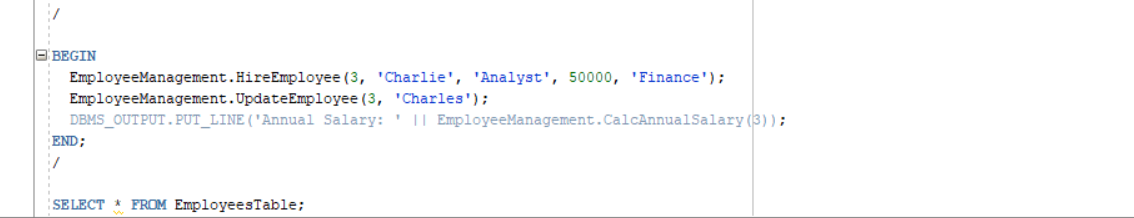
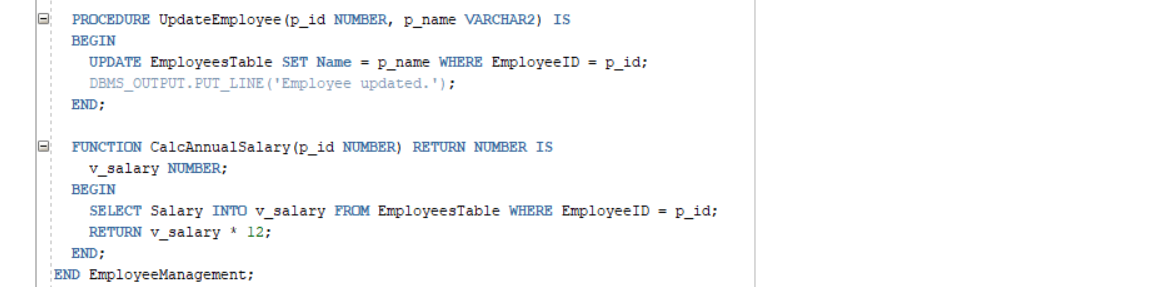
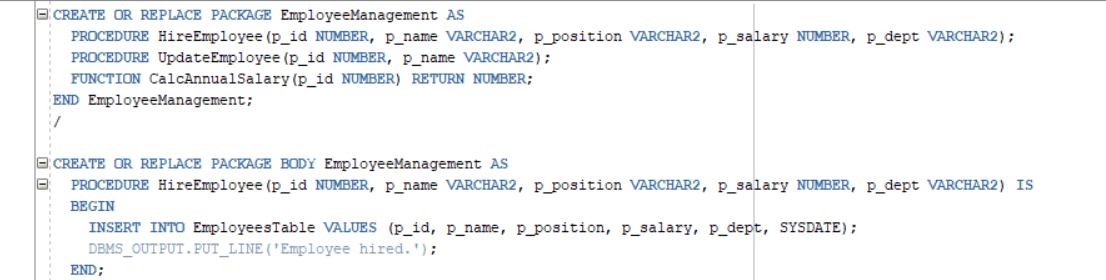




**Scenario 2:**

**Create a package to manage employee data.**

* + **Question:** Write a package **EmployeeManagement** with procedures to hire new employees, update employee details, and a function to calculate annual salary.



**Scenario 3:**

**Group all account-related operations into a package.**

* + **Question:** Create a package **AccountOperations** with procedures for opening a new account, closing an account, and a function to get the total balance of a customer across all accounts.

