GENAI CA-2

21070521055 Purva Mundada

Generate a model to represent interest calculations of a Bank account where the process of calculating interest for 6 months is

a. Find minimum balance for each month

b. Make a total of all minimum balances

c. Calculate interest based on interest rate

d. Divide interest by 12 to find one-month interest

e. Multiply interest by 6 to show interest in the account.

Generate a model to represent transactions and interest calculations for 6 months.

- **Start**
- **Input**:
  - Daily balances for each month (6 months).
  - Annual interest rate.
- **Calculate Minimum Balance for Each Month**:
  - For each month, determine the lowest balance.
- **Calculate Total of Minimum Balances**:
  - Sum up the minimum balances of all months.
- **Calculate Total Interest for 6 Months**:
  - Use the total minimum balance and apply the interest rate.
- **Display Total Interest**:
  - Output the calculated interest.
- **End**

CODE -

```
def calculate_monthly_interest(balance, annual_rate):
    # Convert annual interest rate to monthly rate
    monthly_rate = annual_rate / 12 / 100
    return balance * monthly_rate
```

```
def interest_calculation(balances, annual_rate):
    # Calculate minimum balance for each month
    min_balances = [min(month_balance) for month_balance in zip(*balances)]
    # Total of all minimum balances
    total_min_balance = sum(min_balances)
    # Calculate total interest for 6 months
    total_interest = calculate_monthly_interest(total_min_balance, annual_rate) * 6
    return total_interest
# Example data
# Each list represents the daily balances for a month (30 days for simplicity)
balances = [
    [1000, 1200, 1100, 1150, 1300, 1400, 1200, 1300, 1250, 1150, 1200, 1300, 1400, 1300, 1250,
1300, 1400, 1250, 1200, 1300, 1400, 1250, 1150, 1200, 1300, 1400, 1250, 1200, 1150, 1300, 1400,
1200, 1150, 1300, 1400, 1250, 1200, 1150, 1300, 1400, 1250, 1150, 1300, 1400, 1250, 1200, 1300,
1400, 1150, 1200, 1300, 1400, 1250, 1150],
    [1050, 1250, 1150, 1200, 1350, 1450, 1250, 1350, 1300, 1200, 1250, 1350, 1450, 1350, 1300,
1350, 1450, 1300, 1250, 1350, 1450, 1300, 1200, 1250, 1350, 1450, 1300, 1200, 1250, 1350, 1450,
1300, 1200, 1250, 1350, 1450, 1300, 1250, 1200, 1350, 1450, 1300, 1200, 1350, 1450, 1300, 1250,
1350, 1450, 1200, 1250, 1350, 1450, 1300],
    [1100, 1300, 1200, 1250, 1400, 1500, 1300, 1400, 1350, 1250, 1300, 1400, 1500, 1400, 1350,
1400, 1500, 1350, 1300, 1400, 1500, 1350, 1250, 1300, 1400, 1500, 1350, 1250, 1300, 1400, 1500,
1350, 1250, 1300, 1400, 1500, 1350, 1300, 1250, 1400, 1500, 1350, 1250, 1300, 1400, 1500, 1350,
1250, 1300, 1400, 1500, 1350],
    [1150, 1350, 1250, 1300, 1450, 1550, 1350, 1450, 1400, 1300, 1350, 1450, 1550, 1450, 1400,
1450, 1550, 1400, 1350, 1450, 1550, 1400, 1300, 1350, 1450, 1550, 1400, 1300, 1350, 1450, 1550,
1400, 1300, 1350, 1450, 1550, 1400, 1350, 1300, 1450, 1550, 1400, 1300, 1350, 1450, 1550, 1400,
1350, 1300, 1450, 1550, 1400],
    [1200, 1400, 1300, 1350, 1500, 1600, 1400, 1500, 1450, 1350, 1400, 1500, 1600, 1500, 1450,
1500, 1600, 1450, 1400, 1500, 1600, 1450, 1350, 1400, 1500, 1600, 1450, 1350, 1400, 1500, 1600,
1450, 1350, 1400, 1500, 1600, 1450, 1400, 1350, 1500, 1600, 1450, 1350, 1400, 1500, 1600, 1450,
1400, 1350, 1500, 1600, 1450],
    [1250, 1450, 1350, 1400, 1550, 1650, 1450, 1550, 1500, 1400, 1450, 1550, 1650, 1550, 1500,
1550, 1650, 1500, 1450, 1550, 1650, 1500, 1400, 1450, 1550, 1650, 1500, 1400, 1450, 1550, 1650,
```

1500, 1400, 1450, 1550, 1650, 1500, 1450, 1400, 1550, 1650, 1500, 1400, 1450, 1550, 1650, 1500, 1450, 1400, 1550, 1650, 1500]

]

```
annual_rate = 6  # Annual interest rate in percentage

# Calculate total interest for 6 months

total_interest = interest_calculation(balances, annual_rate)

print(f"Total Interest for 6 Months: {total_interest:.2f}")
```

EXPLANATION -

1. Calculate Monthly Interest:

Function: Converts the annual interest rate to a monthly rate and calculates interest for a given balance.

Formula: Monthly Interest = Balance x (Annual Rate / 12 x 100)

2. Interest Calculation for 6 Months:

- Steps:
  - Find the minimum balance for each month.
  - Sum all minimum balances.
  - Calculate interest for the total minimum balance over 6 months.

3. Data:

- Daily balances for 6 months are simulated.
- The code calculates total interest based on the minimum balance across each month.