MIDDLE EAST TECHNICAL UNIVERSITY, NORTHERN CYPRUS CAMPUS

CNG242 Programming Language Concepts – Lab 8: C++

An Exercise for C++ Classes

1. Implement the Account class which contains two private data elements, an integer accountNumber and a floating-point value accountBalance, and the following default constructor and member functions:

   a. A default constructor that set initial values for accountNumber and accountBalance to 0.

   b. Getter and setter functions for each attribute (accountNumber and accountBalance).

   c. The inputTransaction function, which takes a character value for transactionType ('D' for deposit and 'W' for withdrawal), and a floating-point value for transactionAmount, which updates accountBalance. This function should give an error message if there is no sufficient amount for withdrawal.

   d. The calculateFutureBalance function, which takes annual interest rate and number of years, and then calculates the future balance for the given period. For example if the current amount is 1000, we pass 0.05 as the interest and 1 as the number of years, the amount will be 1050 at the end of the year.

   e. The mortgageYear function, which takes total amount of a mortgage and then calculates the number of years required to pay the mortgage only by using the interest of the current balance. Note that for the mortgage apart from the lump sum we have to pay, there will an interest for the borrowed money.

      Let say we have morgage for 100.000 with annual interest rate 8.90 %, and we do annual payments. Lets assume we have 300.000 in our account with 5% interest rate. At the end of first year mortgage will become 108.900 and from my money I will have 15000 interest rate. Then I can reduce the morgage to 93900.

2. You need to write a complete C++ program for a bank which uses the class implemented in Part (1). This program should provide the following menu for a particular bank account. Hint: You first need to create an Account object.

```
1. Change the account balance
2. Get the current balance
3. Deposit
4. Withdrawal
5. Plan your future balance
6. Mortgage plan
7. Exit
```

Sample Run:

```
1. Change the account balance
2. Get the current balance
3. Deposit
4. Withdrawal
5. Plan your future balance
6. Mortgage plan
7. Exit
Enter your selection: 1
Enter a new account balance: 300000
New account balance is 300000 TL

1. Change the account balance
2. Get the current balance
3. Deposit
4. Withdrawal
5. Plan your future balance
6. Mortgage plan
7. Exit
Enter your selection: 2
Account balance is 300000 TL

1. Change the account balance
2. Get the current balance
3. Deposit
4. Withdrawal
5. Plan your future balance
6. Mortgage plan
7. Exit
Enter your selection: 3
Enter an amount for deposit: 20000
New account balance is 320000 TL

1. Change the account balance
2. Get the current balance
3. Deposit
4. Withdrawal
5. Plan your future balance
6. Mortgage plan
7. Exit
Enter your selection: 4
Enter an amount for withdrawal:
400000
No sufficient amount in the bank
account
New account balance is 320000 TL

1. Change the account balance
2. Get the current balance
3. Deposit
4. Withdrawal
5. Plan your future balance
6. Mortgage plan
7. Exit
Enter your selection: 4
Enter an amount for withdrawal:
20000
New account balance is 300000 TL

1. Change the account balance
2. Get the current balance
3. Deposit
4. Withdrawal
5. Plan your future balance
6. Mortgage plan
7. Exit
Enter your selection: 5
Enter an annual interest rate: 0.05
Enter a number of years: 3
You balance will be 347287.5 TL
after 3 years with the interest
rate 0.05

1. Change the account balance
2. Get the current balance
3. Deposit
4. Withdrawal
5. Plan your future balance
6. Mortgage plan
7. Exit
Enter your selection: 6
Enter a total amount of a mortgage:
100000
Enter an annual mortgage interest
rate: 0.089
Enter an annual interest rate: 0.05
You require 11 years to pay

1. Change the account balance
2. Get the current balance
3. Deposit
4. Withdrawal
5. Plan your future balance
6. Mortgage plan
7. Exit
Enter your selection: 7
Goodbye!
```