**Software Development 3**

In this exercise you are required to write a set of classes to manage a series of withdrawal, lodgement and transfer operations on different bank accounts. The requirements for each of the classes you need to create are documented below.

**Bank Account**

The bank account class has 3 member variables to represent the name, number and balance of a bank account.

Create a suitable constructor to intialise member variables using a parameter list.

Create suitable **getter()** and **setter()** methods.

Create a **lodge()** method which accepts the amount to be lodged as a parameter and updates the balance.

Create a **withdraw()** method which accepts the amount to be withdrawn as a parameter and updates the balance.

Create a **transfer()** method which accepts two parameters: the amount of money to be transferred and the bank account (object reference of type BankAccount) to which the transfer is to be made. You need to withdraw the money from one account and lodge it to the other account.

Create a suitable **toString()** method that displays the bank account details.

**Current Account**

A current account is a type of bank account

The current account has 4 member variables to represent the number of free transactions that a customer has (fixed at 2), the fee per transaction (fixed at 2.0), the overdraft limit, and the transaction count.

Create a suitable constructor to intialise appropriate member variables. The transaction count should be set to 0.

Create suitable **getter()** and **setter()** methods.

Create a **lodge()** method which takes the amount to be lodged as a parameter and updates the transaction count. The balance should also be updated.

Create a **withdraw()** method that accepts the amount to be withdrawn as a parameter and updates the transaction count. You also need to check if there is sufficient funds in the account before a withdrawal can be made. This type of account also has an overdraft limit. If there is sufficient money then the balance should be updated otherwise a message should be displayed indicating "Insufficient Funds".

Create a **calcFees()** method which calculates the fees due for transactions on this account. The fee should also be withdrawn from the account.

Create a suitable **toString()** method that displays the bankaccount details.

**Savings Account**

A savings account is a type of bank account

The current account has 1 member variables to represent the interest rate.

Create a suitable constructor to intialise appropriate member variables.

Create suitable **getter()** and **setter()** methods.

Create a **withdraw()** method that accepts the amount to be withdrawn as a parameter and checks if there is sufficient funds in the account before a withdrawal can be made. If there is sufficient money then the balance should be updated otherwise a message should be displayed indicating "Insufficient Funds".

Create a **calcInterest()** method which calculates the interest dues on the account When calculated the interest should be lodged into the account.

Create a suitable **toString()** method that displays the bankaccount details.

**Test Class**

Create a test classto do the following:

* Create three bank accounts using the data supplied below. (Note an array is not required)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Account | Name | Acc Number | Balance | Interest Rate | Overdraft Limit |
| Savings | Dad | 33333 | 10000 | 3.0% |  |
| Savings | Mum | 44444 | 5000 | 3.5% |  |
| Current | Paul | 323232 | 700 |  | 300 |

* Call the appropriate methods in your test class to perform the following operations on these bank accounts:
  + Lodge 50000 to Dads account
  + Transfer 6000 from Dads account to Mums account
  + Transfer 1000 from Mums account to Pauls account
  + Withdraw 1500 from Pauls account
  + Withdraw 700 from Pauls account
  + Transfer 1000 from Mums account to Pauls account
  + Withdraw 400 from Pauls account
* Call the appropriate method to calculate the interest on the savings account
* Call the appropriate method to calculate the fees on the current account.
* Call the appropriate method to display all account information for each account
* Call the appropriate method to show the number of transactions that Paul had on his account

**Test Output**

Insufficient funds for Paul €700.0 cannot be withdrawn

Account Name: Dad

Account Number: 33333

Account Balance: 55620.0

Interest Rate: 3.0

Account Name: Mum

Account Number: 44444

Account Balance: 9315.0

Interest Rate: 3.5

Account Name: Paul

Account Number: 323232

Account Balance: 796.0

Number Free Transactions: 2

Transaction Fee: 2

Overdraft Limit: 300.0

Number of transactions on Pauls account are: 4