



Foundation Certificate of Higher Education

Module: DOC333 – Introduction to Programming Principles Module

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Profile of the given problem

ABC Bank is a small bank in Sri Lanka that registers their customers to serve them fast. The bank is planning to have an information system to maintain the details of their savings account holders. The system must be able to facilitate opening accounts to new customers (maximum of 5 customers) and display all the customers in the bank with their account number, name and the bank balance when needed. Also, the system should have the facility to change details of the customers (except account number and the bank balance) already registered with the bank, and to deposit and withdraw money when required for a given account. The bank should also be able to view the details of a customer for a given account when required.

When the bank gets a new customer, the following details should be recorded and stored in the system.

Algorithm

1. **Start**
2. **Initialize Variables**
 - 2.1.1. 1.1.Create an empty list of “Customers “to store customer details.
 - 2.1.2. 1.2.Set Count to 2.
3. **While Count is greater than 1, display the main menu with options for the user to choose.**
4. **Display Main Menu**
 - 4.1. Print the bank's main menu
 - 4.1.1. Add a new customer
 - 4.1.2. View details of a customer including bank balance
 - 4.1.3. View details of all the customers with their bank balances
 - 4.1.4. Deposit money to account
 - 4.1.5. Withdraw money from account
 - 4.1.6. Update Customer Details
 - 4.1.7. Exit
5. **Get User Choice:**
 - 5.1. Prompt the user to enter their choice and store it in the variable choice.
6. **Process User Choice:**
 - 6.1. Choice 1: Add a new customer
 - 6.1.1. Display the "Add a New Customer" menu.
 - 6.1.2. If the number of customers is less than 5:
 - 6.1.2.1. Prompt the user to enter customer details (Account Number, NIC, First Name, Last Name, Birth Date, Address, Telephone Number).
 - 6.1.2.2. Set the initial balance to 0.0.
 - 6.1.2.3. Prompt the user to confirm saving the account.
 - 6.1.2.4. If confirmed, append the customer details to the Customers list and display a success message. Otherwise, display an unsuccessful message.
 - 6.2. If the maximum number of customers is reached, display an error message and exit the loop.
7. **Choice 2:** View details of a customer
 - 7.1. Display the "View details of a customer" menu.
 - 7.2. Prompt the user to enter the Account Number.
 - 7.3. Search for the customer in the Customers list by Account Number.
 - 7.4. If found, display the customer's details (Account Number, NIC, Telephone, First Name, Last Name, Balance).
 - 7.5. If not found, display an error message.
8. **Choice 3:** View details of all customers
 - 8.1. Display the "View details of all customers" menu.
 - 8.2. Iterate through each customer in the Customers list and display their details (NIC, Account Number, First Name, Last Name, Balance).
 - 8.3. Prompt the user if they want to update account details.
 - 8.4. If confirmed, prompt the user to enter the Account Number and new details (NIC, First Name, Last Name, Birth Date, Permanent Address, Phone Number). Update the customer details in the Customers list.

9. **Choice 4:** Deposit money to account
 - 9.1. Display the "Deposit Money to a given account" menu.
 - 9.2. Prompt the user to enter the Account Number.
 - 9.3. Search for the customer in the Customers list by Account Number.
 - 9.4. If found, prompt the user to enter the amount to deposit. Update the customer's balance.
 - 9.5. Prompt the user to confirm the deposit. If confirmed, display the new balance. If not found, display an error message.
10. **Choice 5:** Withdraw money from account
 - 10.1. Display the "Withdraw money from a given account" menu.
 - 10.2. Prompt the user to enter the Account Number.
 - 10.3. Search for the customer in the Customers list by Account Number.
 - 10.4. If found, prompt the user to enter the amount to withdraw.
 - 10.5. If the balance is sufficient, deduct the amount from the customer's balance and display the new balance. If insufficient, display an error message.
 - 10.6. If the account is not found, display an error message.
11. **Choice 6:** Update Customer Details
 - 11.1. Display the "Update Customer Details" menu.
 - 11.2. Prompt the user to enter the Account Number.
 - 11.3. Search for the customer in the Customers list by Account Number.
 - 11.4. If found, prompt the user to enter new details (NIC, First Name, Last Name, Birth Date, Permanent Address, Phone Number). Update the customer details in the Customers list.
 - 11.5. Prompt the user to confirm the update. If confirmed, display a success message. If not found, display an error message.
12. **Choice 7:** Exit
 - 12.1. Display the exit message and break the loop to end the program.

13.End.

Test Case 1

➤ Main Menu

Table 1 Test Case1

Test Case 01	Description	Expected Output	Pass/Fail
1	Display the main menu	Display the Main menu: All “7” Possible User details. 1. Add a new customer 2. View details of a customer including bank balance 3. View details of all the customers with their bank balances 4. Deposit money to account 5. Withdraw money from account 6. Update Customer Details	Pass
2	Display Condition	Display “Your Choice”	Pass
3	Display “Exit”	Display “ 7. Exit ”	Pass

```
IDLE Shell 3.12.2
File Edit Shell Debug Options Window Help
Python 3.12.2 (tags/v3.12.2:6abddd9, Feb 6 2024, 21:26:36) [MSC v.1937 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: F:\IIT\Programming & Priciples\ICW\Own.py =====
          ABC Bank
          Main Menu
1. Add a new customer
2. View details of a customer including bank balance
3. View details of all the customers with their bank balances
4. Deposit money to account
5. Withdraw money from account
6. Update Customer Details
7. Exit

          Your Choice7

EXIT
>>>
```

Figure 1 Test Case1(Main Menu)

Test Case 2

➤ Choice 1

Test Case 02	Description	Input	Expected Output	Pass/Fail
1	Display the Add Customers	1	ABC Bank Add a New Customer. Enter Account Number: Enter NIC: Enter First Name: Enter Last name: Enter Birth date: Enter permanent Address: Enter Telephone number:	Pass
2	Display Condition	-	Do you want to save the account (yes/no)? :	Pass
3	Display Account Opened Conformation	Yes	Display “ Account oppened sucessfully!”	Pass
		No	Display”Account opened Unsuccesfully!”	Pass

Table 2 Test Case2

```

                                     Your Choice1
                                     ABC Bank
                                     Add a New Customer.
Enter Account Number: 0123456789
Enter NIC: 123456789V
Enter First Name: Abc
Enter Last name: Bank
Enter Birth date: 19/07/2024
Enter permanent Address: Ramakrishna Rd,Wellawatte
Enter Telephone number: 0651234567
Do you want to save the account (yes/no)? : yes
Account oppened sucessfully!
```

Figure 2 Test case2Choice1

```

                                     ABC Bank
                                     Add a New Customer.
Enter Account Number: 0123456789
Enter NIC: 123456789V
Enter First Name: Abc
Enter Last name: Bank
Enter Birth date: 19/07/2024
Enter permanent Address: Ramakrishna Rd,Wellawatte
Enter Telephone number: 0651234567
Do you want to save the account (yes/no)? : no
Account opened Unsuccessful!
```

Figure 3 Test case2Choice1v

Test case 3

➤ Choice 2

Table 3 Test Case3

Test Case 03	Description	Input	Expected Output	Pass/Fail
1	Ask Customer Account Number	Account Number	Enter Account Number	Pass
2	Display Account holder's Details	-	Account Number: xxxxxxxxx NIC: xxxxxxxxx Telephone: xxxxxxxxx First Name: xxxxxxxxx Last Name: xxxxxxxxx Balance: 99999.99	Pass
3	Display Account Opened Conformation	Yes	Display "Main Menu"	Pass
		No	Display " End of the details!"	Pass
4	Error message	Wrong Account Number	Display " Error can't Find Account!"	Pass

```

                                     Your Choice2
                                ABC Bank
                        View details of a customer
Enter Account Number0123456789
Account Number: 0123456789
NIC: 123456789V
Telephone: 0651234567
First Name: Abc
Last Name: Bank
Balance: 0.0
Do you want to view another account details (yes/No)?: yes

                                ABC Bank
                                Main Menu
1. Add a new customer
2. View details of a customer including bank balance
3. View details of all the customers with their bank balances
4. Deposit money to account
5. Withdraw money from account
6. Update Customer Details
7. Exit
```

Figure 4 Test Case 3 Choice2

```

                                     Your Choice2
                        ABC Bank
                View details of a customer
Enter Account Number7894561230
Account Number: 7894561230
NIC: 741852963V
Telephone: 07894561230
First Name: ABC
Last Name: BANK
Balance: 0.0
Do you want to view another account details (yes/No)?: no
|End of the details!
```

Figure 6 Test Case 3 Choice2

```

                                     Your Choice2
                        ABC Bank
                View details of a customer
Enter Account Number123456987
Error can't Find Account!
```

Figure 5 Test Case 3 Choice2

Test case 4

➤ Choice 3

Test Case 04	Description	Input	Expected Output	Pass/Fail
1	Display all the Customer details	-	NIC: xxxxxxxx Account Number: xxxxxxxx First Name: xxxxxxxx Last Name: xxxxxxxx Balance: 9999.999	Pass
3	Display Update Condition	Yes	Display “Choice 6” to Update the details	Pass
		No	Display “ End of the details!!”	Pass

Table 4 Test Case4

```

Your Choice3
ABC Bank
View details of all customers
NIC: 123456789V
Account Number: 0123456789
First Name: Abcc
Last Name: Bank
Balance: 0.0
Do you want to update the account details (yes/No)?
```

Figure 8 Test Case4 Choice3

```

Do you want to update the account details (yes/No)? yes
Enter the Account Number: 0123456789
Enter the new NIC number: 123456789V
Enter the new First Name of customer: Abc
Enter the new Last Name of customer: Bank
Enter the new Birth Date: 19/07/2023
Enter the new Permanent Address: Wellawatte
Enter the new Phone Number: 0651234567
Do you want to save the new details (Yes/No)?yes
Customer details updated successfully.
.>>|
```

Figure 7 Test Case4 Choice3

```

Your Choice3
ABC Bank
View details of all customers
NIC: 123456789V
Account Number: 0123456789
First Name: Abc
Last Name: Bank
Balance: 0.0
Do you want to update the account details (yes/No)? no
End of the Details!!

```

Figure 9 Test Case4 Choice3

Test Case 5

➤ Choice 4

Test Case 05	Description	Input	Expected Output	Pass/Fail
1	Ask customer Account Number	Account Number	Display “Enter Account Number:”	Pass
2	Ask the customer for the Deposit Amount	Amount	Display “Enter the amount to Deposit”	Pass
3	Ask condition “Do you want to save (Yes/No)?”	Yes	Display “Deposit successful. New Balance:”	Pass
		No	Display “Deposit Unsuccessful!!”	Pass

Table 5 Test Case5

```

Your Choice4
ABC Bank
Deposit Money to a given account
Enter Account Number: 0123456789
Enter the amount to Deposit: 9999.99
Do you want to save (Yes/No)?no
Deposit Unsuccessful!!

```

Figure 10 Test Case5 Choice4

```

Your Choice4
ABC Bank
Deposit Money to a given account
Enter Account Number: 0123456789
Enter amount to Deposit: 9999.999
Do you want to save (Yes/No)?yes
Deposit successful. New balance: 9999.999

```

Figure 11 Test Case5 Choice4

Test Case 6

➤ Choice5

Test Case 06	Description	Input	Expected Output	Pass/Fail
1	Ask for the customer Account Number	Account Number	Display “Enter Account Number:”	Pass
2	Ask the customer for the Withdraw Amount	Amount	Display “Enter the amount to Withdraw”	Pass
3	Ask condition “Do you want to save (Yes/No)?”	Yes	Display “Withdraw successful. New balance:”	Pass
		No	Display “Transaction was canceled”	Pass
4	Balance insufficient	Limit exceed amount	Display “Balance insufficient”	Pass

Table 6 Test case6

```

Your Choice5
ABC Bank
Withdraw money from a given account
Enter Account Number: 0123456789
Enter the amount to Withdraw: 99.00
Do you want to save (Yes/No)?no

```

Figure 12 Test Case6 Choice5

```

Your Choice5
ABC Bank
Withdraw money from a given account
Enter Account Number: 0123456789
Enter the amount to Withdraw: 99.99
Do you want to save (Yes/No)?no
Transaction was canceled

```

Figure 13 Test Case6 Choice5

```

Your Choice5
ABC Bank
Withdraw money from a given account
Enter Account Number: 0123456789
Enter the amount to Withdraw: 999999.99
Insufficient Balance.
```

Figure 14 Test Case6 Choice5

```

Your Choice5
ABC Bank
Withdraw money from a given account
Enter Account Number: 0123456789
Enter the amount to Withdraw: 99.99
Do you want to save (Yes/No)?yes
Withdraw successful. New balance: 99900.0
```

Figure 15 Test Case6 Choice5

Test Case 7 (Choice 6)

Test Case 0	Description	Input	Expected Output	Pass/Fail
1	Ask for the customer Account Number	Account Number	Display “Enter Account Number:”	Pass
2	Update Nic	New Nic Number	Display “ Enter the new NIC number”	Pass
	Update First Name	New First Name	Display “ Enter the new First Name of customer:”	Pass
	Update Last Name	New Last Name	Display “ Enter the new Last Name of customer:”	Pass
	Update Birth Date	New Birth Date	Display “ Enter the new Birth Date: ”	Pass
	Update Permanent Address	New Permanent Address	Display “ Enter the new Permanent Address:”	Pass
	Update Phone Number	New Phone Number	Display “ Enter the new Phone Number:”	Pass
3	Ask condition “Do you want to save the new details (Yes/No)?:”	Yes	Display “Customer details updated successfully.”	Pass
		No	Display “Transaction was canceled”	Pass
4	Balance insufficient	Limit exceed amount	Display “Balance insufficient”	Pass

Table 7 Test Case7


```

Your Choice6
ABC Bank
Update Customer Details
Enter the Account Number: 0123456789
Enter the new NIC number: 123456789V
Enter the new First Name of customer: ABC
Enter the new Last Name of customer: BANK
Enter the new Birth Date: 19/07/2024
Enter the new Permanent Address: Wellawatte
Enter the new Phone Number: 0651234567
Do you want to save the new details (Yes/No)?yes
Customer details updated successfully.

```

Figure 19 Test Case7 Choice6

```

Your Choice6
ABC Bank
Update Customer Details
Enter the Account Number: 0123456789
Enter the new NIC number: 123456789V
Enter the new First Name of customer: Abc
Enter the new Last Name of customer: Bank
Enter the new Birth Date: 19/07/2024
Enter the new Permanent Address: Wellawatte
Enter the new Phone Number: 06512234567
Do you want to save the new details (Yes/No)?yes
Customer details updated successfully.

```

Figure 16 Test Case7 Choice6

```

Your Choice6
ABC Bank
Update Customer Details
Enter the Account Number: 0123456789
Enter the new NIC number: 123456789V
Enter the new First Name of customer: Abc
Enter the new Last Name of customer: Bank
Enter the new Birth Date: 19/07/2024
Enter the new Permanent Address: Wellawatte
Enter the new Phone Number: 06512234567.
Do you want to save the new details (Yes/No)?no
End of the Details!!

```

Figure 17 Test Case7 Choice6

```

Your Choice6
ABC Bank
Update Customer Details
Enter the Account Number: 11222233
Error ccan't Find Account

```

Figure 18 Test Case7 Choice6

Test Case 8 (Choice 7)

Table 8 Test Case8

Test Case 07	Description	Input	Expected Output	Pass/Fail
1	End with Program	7	Display “EXIT”	Pass
2	Invalid Choice	“Above 7”	Display “Different Choice”	Pass

```

                                ABC Bank
                                Main Menu
1. Add a new customer
2. View details of a customer including bank balance
3. View details of all the customers with their bank balances
4. Deposit money to account
5. Withdraw money from account
6. Update Customer Details
7. Exit
                                Your Choice8
Different Choice
```

Figure 21 Test case 8 Different Choice

```

                                ABC Bank
                                Main Menu
1. Add a new customer
2. View details of a customer including bank balance
3. View details of all the customers with their bank balances
4. Deposit money to account
5. Withdraw money from account
6. Update Customer Details
7. Exit
                                Your Choice7
EXIT
```

Figure 20 TestCase8 Choice7