

# **CSCP 2023 - Object Oriented Programming**

## **Assignment # 3**

### **Abstract Class and Polymorphism**



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**Session: Fall 2020**

**Faculty of Information Technology UCPLahore  
Pakistan**

**You will be developing a Bank Management System (BMS) that manages various types of Bank Accounts:**

Saving, Checking, Current and Investment Accounts.

All bank accounts have the following characteristics:

- Title (full name of the account holder)
- Account number (a 16 digit unique number)
- Account balance (amount in rupees that is held in the account)
- Function that displays all of the account variables in this format: < Title; Account number; Account balance>
- Function that can deposit to the account
- Function that can do a withdrawal from the account

The other accounts have the following attributes in addition to the ones described above:

### **Saving**

- Interest rate
- Function that calculates interest on the balance using the interest rate

### **Checking**

- Fees that is charged on each account transaction (deposit or withdrawal)

### **Current**

- Fees that is charged on each account transaction (deposit or withdrawal)
- Required Minimum balance

### **Investment**

- Fees that is charged on each account transaction (deposit or withdrawal)
- Required Minimum balance
- Percent profit

**Remember: Your Programme should not allow to make an object of Base Class BankAccount.**

**All these account are held by a bank branch class named as **Branch**:**

**Attributes:**

- Array to hold all the bank accounts
- A counter to maintain number of accounts added and indexing of the array
- Total Balance held by all the accounts of the branch

**Methods:**

- To add a new account
- To delete an account(with specific Account Tittle e.g. using “**Imran Khan**”)
- To update an existing account(with specific Account Tittle e.g. using “**Imran Khan**”)
- To find an account by **account number**
- To find an account by account title key word e.g. using “**Imran Khan**” will find and display all such accounts that have “**Imran Khan**” in the title of those accounts
- A menu that provides a menu to select and perform a particular function of the **Branch**

**Non-Member Function:**

- Function that display all accounts on the screen

**Hint:** Will require indexing [] operator.

**What else is Required:**

- For each class provide:
  - Parameterized constructor with default arguments and Copy Constructor(use base initializer list with both constructors)
  - Destructor(with no memory leakage)
  - Getters/Setters for all private attributes(with no memory leakage and no returning of original memory handler)
  - Assignment Operator(with no memory leakage)
  - Don't provide function where you can overload operators, therefore must provide the following operators:
    - Equal operator ==
    - Not equal operator !=
    - cin>> and cout<< operators (**Do not use friend keyword this time**)
    - Array index operator [] where applicable