Solution Review: Implement Banking Application Using Polymorphism

This review provides a detailed analysis on how to solve the 'Implement a Banking Application Using Polymorphism' challenge.

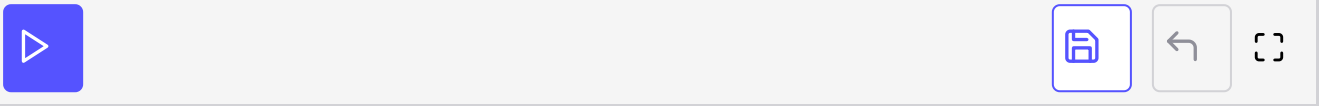
WE'LL COVER THE FOLLOWING

Solution

```
class Account {

    private double _balance;

    protected double Balance {
        get { return this._balance; }
        // Check before setting the balance
        set { if(value>=0)
              this._balance = value;
            }
    }
    // Constructor
    public Account(double balance) {
        this.Balance = balance;
    }
    //Virtual Methods
    public virtual bool Deposit(double amount) {

        return false;
    }


    public virtual bool Withdraw(double amount) {

        return false;
    }


    public virtual void PrintBalance() {

        Console.WriteLine("The balance is: " + Balance);
    }
```

```
    }

}

class SavingsAccount : Account {

    private double _interestRate;
    // Constructor
    public SavingsAccount(double balance)
        : base(balance)
    {   // It's always preferable to initialize fields inside a constructor
        this._interestRate = 0.8;
    }
    // Overridden Methods
    public override bool Deposit(double amount) {
        if(amount > 0) { // Check if amount is non-zero and non-negative
            // Adding to balance with interest rate
            Balance += amount + (amount * this._interestRate);
            return true;
        }
        return false;
    }


    public override bool Withdraw(double amount) {
        if(amount > 0 && amount <= Balance) { // Check if amount is non-zero and less than ec
            // Deducting from balance with interest rate
            Balance -= amount + (amount * this._interestRate);
            return true;
        }
        return false;
    }


    public override void PrintBalance() {

        Console.WriteLine("The saving account balance is: " + base.Balance);
    }

}

class CheckingAccount : Account
{
    // Constructor
    public CheckingAccount(double balance)
        : base(balance) { }

    // Overridden Methods
    public override bool Deposit(double amount) {
        if (amount > 0)
        {
            Balance += amount;
            return true;
        }
        return false;
    }


    public override bool Withdraw(double amount) {
        if (amount > 0 && amount <= Balance)
        {
            Balance -= amount;
            return true;
```

```
        }
        return false;
    }


    public override void PrintBalance() {

        Console.WriteLine("The checking account balance is: " + base.Balance);
    }

}

class Demo {

    public static void Main(string[] args) {

        Account SAccount = new SavingsAccount(5000);

        // Creating saving account object
        SAccount.Deposit(1000);
        SAccount.PrintBalance();

        SAccount.Withdraw(3000);
        SAccount.PrintBalance();

        Console.WriteLine();

        // Creating checking account object
        Account CAccount = new CheckingAccount(5000);
        CAccount.Deposit(1000);
        CAccount.PrintBalance();

        CAccount.Withdraw(3000);
        CAccount.PrintBalance();

    }

}
```



Explanation

- We have implemented the `Account` class which has the **_balance** double field, and three `public virtual` methods **Deposit(double amount)**, **Withdraw(double amount)** and **PrintBalance()**.

- Implemented `SavingsAccount` and `CheckingAccount` classes derived from the `Account` class.

- `SavingsAccount` class has the private double **_interestRate** field and following methods:

    - Overriding `Withdraw(double amount)` method that deducts *amount*

    - Overriding `Withdraw(double amount)` method that deducts *amount* from the *balance* with *interestRate* after checking the validity of a transaction.
    - Overriding `Deposit(double amount)` method that adds *amount* in the *balance* with *interestRate* after checking the validity of a transaction.
    - `PrintBalance()` displays the balance in the *account*.
- `CheckingAccount` class has the following methods:
    - Overriding `Withdraw(double amount)` that deducts *amount* from *balance* after checking the validity of a transaction.
    - Overriding `Deposit(double amount)` that adds *amount* in *balance* after checking the validity of a transaction.
    - `PrintBalance()` displays the balance in the *account*.
- Created `SavingsAccount` and `CheckingAccount` objects by calling the parameterized constructors of the classes and printed their balance by calling their respective `PrintBalance()` methods