Building a Simple Bank Account Management System in Java

Case Study

Problem

Create a simple bank account management system where users can:

1. Create a new bank account.
2. Deposit money into their account.
3. Withdraw money from their account.
4. Check their account balance.

Requirements

1. An account has:
   - An account number
   - A balance
2. Ability to:
   - Deposit money
   - Withdraw money
   - Check balance

Class and Variables

Class and Variables

```
public class BankAccount {

  private String accountNumber;

  private double balance;
```

Constructor

Constructor

```
public BankAccount(String accountNumber, double initialBalance) {
    this.accountNumber = accountNumber;
    this.balance = initialBalance;
  }
```

Method to deposit money

Method to deposit money

```
public void deposit(double amount) {
  if (amount > 0) {
    balance += amount;
    System.out.println("Deposited: $" + amount);
  } else {
    System.out.println("Invalid deposit amount.");
  }
}
```

Method to withdraw money

Method to withdraw money

```
public void withdraw(double amount) {
  if (amount > 0 && balance >= amount) {
    balance -= amount;
    System.out.println("Withdrew: $" + amount);
  } else {
    System.out.println("Invalid withdrawal amount or insufficient funds.");
  }
}
```

Method to check balance
& Main method to test the class

Method to check balance & Main method to test the class

```
public static void main(String[] args) {
  BankAccount myAccount = new BankAccount("123456", 1000.00);
  myAccount.deposit(200);
  myAccount.checkBalance();
  myAccount.withdraw(50);
  myAccount.checkBalance();
}
```

Summary

1. **Class Definition**: The `BankAccount` class encapsulates the features of a bank account.
2. **Instance Variables**: `accountNumber` and `balance` are instance variables that hold the account information.
3. **Constructor**: Initializes a new `BankAccount` object with an account number and an initial balance
4. **Methods**:
    - `deposit()`: Adds money to the account.
    - `withdraw()`: Removes money from the account.
    - `checkBalance()`: Prints the current balance.
5. **Main Method**: Creates a `BankAccount` object and calls its methods to demonstrate functionality.

Key points

1. Classes and constructors serve as the building blocks of an object-oriented language like Java.
2. Methods enable encapsulation and provide functionalities to manipulate the object's state.
3. This case study demonstrates how these concepts can be practically applied to build a simple system.