

Assignment No-5

Title:- ATM machine simulation using Java and Exception Handling.

Objective :-

To design and implement a simple ATM simulation using Java that allows users to perform basic banking operations which checking balance, depositing money, and withdrawing money. The application must demonstrate the use of exception handling (try, catch, finally) to manage invalid inputs and runtime errors gracefully.

Theory :-

In real-world applications, users, often interact with systems in unpredictable ways, therefore, it's crucial to build robust applications that can handle errors without crashing. Java provides built-in mechanism to handle such exceptions using.

- Balance inquiry $\Rightarrow$ Display current account balance.
- Withdrawal $\Rightarrow$ Deduct money from account if insufficient funds, throw ArithmeticException.

tic exception.

- deposit $\Rightarrow$ Add money to account; if input is invalid (like negative amt) throw Illegal exceptions.
- finally block ensures execution of important cleanup code, e.g., showing transaction complete message. This ensures the program runs smoothly, even when users make mistake.

* Algorithm:-

1. Start the program
2. Initialize account balance with a default value.
3. Display a menu:-
 - check balance
 - Deposit money
 - withdraw money
 - Exit
4. Take user input
5. Switch case to handle user choice:
 - check Balance $\rightarrow$ Display current balance

- Deposit $\rightarrow$ Ask for amount
- If amount ≤ 0 , throw Illegal Argument Esec
- Else, deduct from balance

6. Use try, catch and finally blocks for exception handling.

7. Loop back to the menu until user select exit.

8. End Program

conclusion:-

The Java program successfully simulated an ATM machine with basic functionalities. By using exception handling the program continues to run smoothly even in error conditions, such as insufficient balance or valid input. This demonstrate how exception on handling ensures reliability robustness of and user friendly execution in real-time application.

Title:

Simulation of ATM Machine Using Java with Exception Handling

package ATM_simulation;

```
import java.util.Scanner;

class InsufficientFundsException extends Exception {

    public InsufficientFundsException(String message) {

        super(message);
    }
}

public class ATMSimulation {

    private double balance;

    private final int pin = 1234; // predefined PIN

    public ATMSimulation(double initialBalance) {

        this.balance = initialBalance;
    }

    // Method for PIN verification
    public boolean verifyPin(int enteredPin) {

        return enteredPin == pin;
    }

    // Method to check balance
    public void checkBalance() {

        System.out.println("Your Current Balance: ₹" + balance);
    }

    // Deposit method
    public void deposit(double amount) {

        if (amount <= 0) {

            System.out.println("Invalid deposit amount.");
        }
    }
}
```

```
} else {  
    balance += amount;  
    System.out.println("Successfully Deposited ₹" + amount);  
}  
}
```

```
// Withdraw method
```

```
public void withdraw(double amount) throws InsufficientFundsException {  
    if (amount <= 0) {  
        System.out.println("Invalid withdrawal amount.");  
    } else if (amount > balance) {  
        throw new InsufficientFundsException("Insufficient Balance! Available: ₹" + balance);  
    } else {  
        balance -= amount;  
        System.out.println("Successfully Withdrawn ₹" + amount);  
    }  
}
```

```
// Main method
```

```
public static void main(String[] args) {  
    Scanner sc = new Scanner(System.in);  
    ATMSimulation atm = new ATMSimulation(5000); // initial balance  
  
    try {  
        System.out.print("Enter your PIN: ");  
        int enteredPin = sc.nextInt();  
  
        if (!atm.verifyPin(enteredPin)) {  
            throw new Exception("Invalid PIN! Access Denied.");  
        }  
  
        int choice;  
        do {  
            System.out.println("\n===== ATM Menu =====");  
            System.out.println("1. Check Balance");
```

```
System.out.println("2. Deposit");
```

```
System.out.println("3. Withdraw");
```

```
System.out.println("4. Exit");
```

```
System.out.print("Enter your choice: ");
```

```
choice = sc.nextInt();
```

```
switch (choice) {
```

```
    case 1:
```

```
        atm.checkBalance();
```

```
        break;
```

```
    case 2:
```

```
        System.out.print("Enter amount to deposit: ");
```

```
        double depositAmount = sc.nextDouble();
```

```
        atm.deposit(depositAmount);
```

```
        break;
```

```
    case 3:
```

```
        System.out.print("Enter amount to withdraw: ");
```

```
        double withdrawAmount = sc.nextDouble();
```

```
        try {
```

```
            atm.withdraw(withdrawAmount);
```

```
        } catch (InsufficientFundsException e) {
```

```
            System.out.println(e.getMessage());
```

```
        }
```

```
        break;
```

```
    case 4:
```

```
        System.out.println("Thank you for using ATM!");
```

```
        break;
```

```
    default:
```

```
        System.out.println("Invalid choice. Try again.");
```

```
}
```

```
} while (choice != 4);
```

```
} catch (Exception e) {  
    System.out.println("Error: " + e.getMessage());  
}  
} finally {  
    sc.close();  
}  
}  
}
```

*****OUTPUT*****

Enter your PIN: 1234

===== ATM Menu =====

1. Check Balance
2. Deposit
3. Withdraw
4. Exit

Enter your choice: 1

Your Current Balance: ₹5000.0

===== ATM Menu =====

1. Check Balance
2. Deposit
3. Withdraw
4. Exit

Enter your choice: 2

Enter amount to deposit: 2000

Successfully Deposited ₹2000.0

===== ATM Menu =====

1. Check Balance
2. Deposit

3. Withdraw

4. Exit

Enter your choice: 1

Your Current Balance: ₹7000.0

===== ATM Menu =====

1. Check Balance

2. Deposit

3. Withdraw

4. Exit

Enter your choice: 3

Enter amount to withdraw: 8000

Insufficient Balance! Available: ₹7000.0

===== ATM Menu =====

1. Check Balance

2. Deposit

3. Withdraw

4. Exit

Enter your choice: 3

Enter amount to withdraw: 3000

Successfully Withdrawn ₹3000.0

===== ATM Menu =====

1. Check Balance

2. Deposit

3. Withdraw

4. Exit

Enter your choice: 1

Your Current Balance: ₹4000.0

===== ATM Menu =====

1. Check Balance

2. Deposit

3. Withdraw

4. Exit

Enter your choice: 4

Thank you for using ATM!