

Practical No:15

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Semester: 3
Date: November 22, 2021

Objective: WAP to implement multithreading and using it elaborate the synchronization.

Code :

```
import java.util.Scanner;

class _77_BankOfJointAccount{
    double jointAmount;
    synchronized void show(){
        System.out.println("The current amount is: "+ jointAmount);
    }

    // void addBalance(double amount, String name){
    synchronized void addBalance(double amount, String name){
        System.out.println(name+ ": ");
        jointAmount+=amount;
        System.out.println("Added amount is: "+ amount);
        show();
    }

    // void withdrawBalance(double amount, String name){
    synchronized void withdrawBalance(double amount, String name){
        System.out.println(name+ ": ");
        jointAmount-=amount;
        System.out.println("Withdrawal amount is: "+ amount);
        show();
    }
}

class _77_TestSynchronized01 extends java.lang.Thread{
    _77_BankOfJointAccount account;
    String name;

    // constructor
    _77_TestSynchronized01(_77_BankOfJointAccount account, String name){
```

```

        this.name= name;
        this.account= account;
    }

    public void run(){
        double amount=500;
        account.addBalance(amount, name);
        account.withdrawBalance(amount, name);
    }
}

class _77_TestSynchronized02 extends java.lang.Thread{
    _77_BankOfJointAccount account;
    String name;

    // constructor
    _77_TestSynchronized02(_77_BankOfJointAccount account, String name){
        this.name= name;
        this.account= account;
    }

    public void run(){
        double amount=982.76;
        Scanner sc = new Scanner(System.in);
        account.addBalance(amount, name);
        account.withdrawBalance(amount, name);
    }
}

class _77_TestSynchronized03 extends java.lang.Thread{
    _77_BankOfJointAccount account;
    String name;

    // constructor
    _77_TestSynchronized03(_77_BankOfJointAccount account, String name){
        this.name= name;
        this.account= account;
    }

    public void run(){
        double amount=10000.78;
        account.addBalance(amount, name);
        account.withdrawBalance(amount, name);
    }
}

```

```

class _77_TestSynchronized04 extends java.lang.Thread{
    _77_BankOfJointAccount account;
    String name;

    // constructor
    _77_TestSynchronized04(_77_BankOfJointAccount account, String name){
        this.name= name;
        this.account= account;
    }

    public void run(){
        double amount=98.6;
        account.addBalance(amount, name);
        account.withdrawBalance(amount, name);
    }
}

public class _77_Synchronized {
    public static void main(String[] args) {
        _77_BankOfJointAccount account= new _77_BankOfJointAccount();
        _77_TestSynchronized01 t1= new _77_TestSynchronized01(account,
"Deepankar");
        _77_TestSynchronized02 t2= new _77_TestSynchronized02(account, "Oliver");
        _77_TestSynchronized03 t3= new _77_TestSynchronized03(account, "Dean
Winchester");
        _77_TestSynchronized04 t4= new _77_TestSynchronized04(account, "Bruce
Wayne");
        t1.start();
        t2.start();
        t3.start();
        t4.start();

        _77_TestSynchronized01 [] arr= new _77_TestSynchronized01[10];
        for (_77_TestSynchronized01 i : arr) {
            i=new _77_TestSynchronized01(account, "name"+ i);
            i.start();
        }

    }
}

```

Output:

```
PPS E:\03 Semester\Java\MOODLE\Unit 01 and 02\_65_MultiThreading> cd
"e:\03 Semester\Java\MOODLE\Unit 01 and 02\_65_MultiThreading\" ; if ($?)
{ javac _77_Synchronized.java } ; if ($?) { java _77_Synchronized }
```

Deepankar:

Added amount is: 500.0

The current amount is: 500.0

Deepankar:

Withdrawal amount is: 500.0

The current amount is: 0.0

Bruce Wayne:

Added amount is: 98.6

The current amount is: 98.6

Bruce Wayne:

Withdrawal amount is: 98.6

The current amount is: 0.0

Dean Winchester:

Added amount is: 10000.78

The current amount is: 10000.78

Dean Winchester:

Withdrawal amount is: 10000.78

The current amount is: 0.0

Oliver:

Added amount is: 982.76

The current amount is: 982.76

Oliver:

Withdrawal amount is: 982.76

The current amount is: 0.0

namenu1:

Added amount is: 500.0

The current amount is: 500.0

namenu1:

Withdrawal amount is: 500.0

The current amount is: 0.0

namenu1:

Added amount is: 500.0

The current amount is: 500.0

namenull:

Withdrawal amount is: 500.0

The current amount is: 0.0

namenull:

Added amount is: 500.0

The current amount is: 500.0

namenull:

Withdrawal amount is: 500.0

The current amount is: 0.0

namenull:

Added amount is: 500.0

The current amount is: 500.0

namenull:

Withdrawal amount is: 500.0

The current amount is: 0.0

namenull:

Added amount is: 500.0

The current amount is: 500.0

namenull:

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namenull:

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The current amount is: 0.0