OOP Lab: Experiment 5

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Exercise 1: Write a program to create interface named test. In this interface the member function is square. Implement this interface in arithmetic class. Create one new class called ToTestInt. In this class use the object of arithmetic class.

Code:

```java
LAB > Experiment 5 > Baahri Maal > Exp1 ToTestInt.java > ToTestInt >
1   //Write a program to create interface named test. I
2   //Implement this interface in arithmetic class. Cre
3   //In this class use the object of arithmetic class.
4
5   interface test
6   {
7       void square();
8   }
9
10  class arithmetic implements test
11  {
12      public void square()
13      {
14          System.out.println("Square!");
15      }
16  }
17
18  class ToTestInt
19  {
    Run | Debug
20      public static void main(String arg[])
21      {
22          test t = new arithmetic();
23          t.square();
24      }
25  }
26
```

Output:

```
va-OOP\LAB\Experiment 5\Baahri Maal\" ; if ($?)
Square!
PS F:\UPES\Academics\2nd Year\3rd Semester\OOPs
```

Output:

```
va-OOP\LAB\Experiment 5\Baahri Maal\" ; if ($?)
Square!
PS F:\UPES\Academics\2nd Year\3rd Semester\OOPs
```

Exercise 2: Write a program to create interface A, in this interface we have two method meth1 andmeth2. Implements this interface in another class named MyClass.

Code:

```java
1    // Write a program to create interface A, in this interf
2    // Implements this interface in another class named MyCl
3
4    interface A
5    {
6        void meth1();
7        void meth2();
8    }
9
10   class MyClass implements A
11   {
12       public void meth1()
13       {
14           System.out.println("meth1\n");
15       }
16       public void meth2()
17       {
18           System.out.println("meth2");
19       }
         Run | Debug
20       public static void main(String arg[])
21       {
22           MyClass obj = new MyClass();
23           obj.meth1();
24           obj.meth2();
25       }
26   }
27
```

Output:

```
PS F:\UPES\Academics\2nd Year\3rd Semester\OOPs
va-OOP\LAB\Experiment 5\Baahri Maal\" ; if ($?)
meth1

meth2
PS F:\UPES\Academics\2nd Year\3rd Semester\OOPs
```

Exercise 3: Write a program in Java to show the usefulness of Interfaces as a place to keep constant value of the program

Code:

```java
// Write a program in Java to show the usefulness of Interfaces as a place
interface compute
{
    int operation(int x, int y);
}
class Addition implements compute
{
    public int operation(int x, int y)
    {
        return x+y;
    }
}
class Multiplication implements compute
{
    public int operation(int x, int y)
    {
        return x*y;
    }
}
class Exp3{
    Run | Debug
    public static void main(String arg[]){
        Addition a = new Addition();
        Multiplication m = new Multiplication();
        compute InterfaceVar;
        InterfaceVar = a;
        System.out.println("Add: "+InterfaceVar.operation(9,3) + "\n");
        InterfaceVar = m;
        System.out.println("Multiply: "+InterfaceVar.operation(9,3));
    }
}
```

Output:

```
PS F:\UPES\Academics\2nd Year\3rd Semester\OOPs
va-OOP\LAB\Experiment 5\Baahri Maal\" ; if ($?)
Add: 12

Multiply: 27
PS F:\UPES\Academics\2nd Year\3rd Semester\OOPs
```

Exercise 4: Write a program to create an Interface having two methods division and modules. Create a class, which overrides these methods.

Code:

```java
interface subject
{
    void division(int x, int y);
    void modules(int a, int b);
}
class sub implements subject
{
    int VarDiv, VarMod;
    public void division(int x, int y)
    {
        VarDiv = x/y;
    }
    public void modules(int a, int b)
    {
        VarMod = a%b;
    }
    void print(){
        System.out.println("Division: "+VarDiv + "\n");
        System.out.println("Modules: "+VarMod);
    }
}
class Exp4
{
    public static void main(String arg[])
    {
        sub Interface = new sub();
        Interface.division(20,4);
        Interface.modules(15,7);
        Interface.print();
    }
}
```

Output:

```
va-OOP\LAB\Experiment 5\Baahri Maal\" ; if ($?)
Division: 5

Modules: 1
PS F:\UPES\Academics\2nd Year\3rd Semester\OOPs
```

Exercise 5: Write program to create an interface Stack Interface having methods push (), pop ()and display (). Stack Class implements Stack Interface. Class Stack Class contains the main method which is having a switch case for selecting the particular operation of the stack.

Code:

```java
1    import java.io.*;
2    import java.util.Scanner;
3    class stack {
4        static int ch;
5        int element, maxsize, top;
6        int[] st;
7        public stack() {
8            Scanner sc = new Scanner(System.in);
9            System.out.print("Stack size? ");
10           maxsize = sc.nextInt();
11           st = new int[maxsize];
12           top = -1;
13           System.out.println("-----------------------------------");
14       }
15       public void push(int element) {
16           if(top ==maxsize-1) {
17               System.out.println("\nOverflow!!\n");
18           } else {
19               try {
20                   st[++top] = element;
21               } catch (ArrayIndexOutOfBoundsException e) {
22                   System.out.println(e);
23               }
24           }
25       }
26       public int pop() {
27           if (top == -1) {
28               System.out.println("\nUnderFlow!!\n");
29               return (-1);
30           }
31           else {
32               System.out.print("\nPopped: " +(st[top--]));
```

```java
33                return 0;
34            }
35        }
36
37        public void display(int[] st, int max_size) {
38            int i;
39            System.out.print("\nStack Elements: ");
40            for (i = 0; i <= max_size; i++)
41                System.out.print(st[i] + "\t");
42            System.out.print("\n");
43            new Band();
44        }
45    }
46    class Band {
47        static int ch;
48
         Run | Debug
49        public static void main(String[] args) {
50            stack obj = new stack();
51    💡      while (true) {
52                System.out.println("\n1) PUSH\n2) POP\n3) Display\n4) EXIT");
53                System.out.print("Enter option: ");
54                Scanner integer = new Scanner(System.in);
55                ch = integer.nextInt();
56                switch (ch) {
57                    case 1:
58                        System.out.print("Enter Element: ");
59                        obj.element = integer.nextInt();
60                        obj.push(obj.element);
61                        break;
62                    case 2:
63                        obj.pop();
64                        break;
65                    case 3:
66                        obj.display(obj.st, obj.top);
67                        break;
68                    case 4:
69                        System.exit(0);
70                    default:
71                        System.out.println("Wrong option!");
72                }
73            }
74
75        }
76    }
77
```

Output:

```
va-OOP\LAB\Experiment 5\Baahri Maal\" ; if ($?) {
Stack size? 5
-----------------------------------

1) PUSH
2) POP
3) Display
4) EXIT
Enter option: 1
Enter Element: 34

1) PUSH
2) POP
3) Display
4) EXIT
Enter option: 1
Enter Element: 65

1) PUSH
2) POP
3) Display
4) EXIT
Enter option: 1
Enter Element: 64

1) PUSH
2) POP
3) Display
4) EXIT
Enter option: 1
Enter Element: 67
```

```
Enter option: 1
Enter Element: 67

1) PUSH
2) POP
3) Display
4) EXIT
Enter option: 1
Enter Element: 68

1) PUSH
2) POP
3) Display
4) EXIT
Enter option: 1
Enter Element: 23

Overflow!!


1) PUSH
2) POP
3) Display
4) EXIT
Enter option: 3

Stack Elements: 34      65      64      67      68

1) PUSH
2) POP
3) Display
4) EXIT
Enter option: 2
```

```
Stack Elements: 34      65      64      67      68

1) PUSH
2) POP
3) Display
4) EXIT
Enter option: 2

Popped: 68
1) PUSH
2) POP
3) Display
4) EXIT
Enter option: 3

Stack Elements: 34      65      64      67
```