

Ex. No. 6	Interfaces
Date of Exercise	16-02-2018

Aim:

Create an interface called Library which contains the functions such as ReturnBook, BorrowBook, and Display. Create Student class and Faculty class both of which implements the Library interface. Use necessary class members such as regno, name, department, no_books, etc. Perform menu driven operations like CreateStudent, CreateFaculty, ReturnBook, BorrowBook and Display from a Main class.

Note: You should use array of objects

Algorithm:

- 1) Start.
- 2) Create an interface called library containing the functions ReturnBook, BorrowBook and display.
- 3) Create a student class and faculty class both implementing library interface.
- 4) Initialize data members such as regno, name, department, no_books, etc.
- 5) Then, in main function perform menu driven operations.
- 6) Also, use array of objects.

Source Code:

```
package ex6;

import java.util.*;

/**
 * @author JUSTIN PAUL
 */

interface Library
{
    void ReturnBook();
}
```

```
void BorrowBook();

void Display();}

class Student implements Library
{
    String regno, name, department;
    int np_books=200;
    private Scanner s;

    public String getRegno() {
        return regno;}

    public void setRegno(String regno) {
        this.regno = regno;}

    public String getName() {
        return name;}

    public void setName(String name) {
        this.name = name;}

    public String getDepartment() {
        return department;}

    public void setDepartment(String department) {
        this.department = department;}

    public int getNp_books() {
        return np_books;}

    public void setNp_books(int np_books) {
        this.np_books = np_books;}

    int no1;
```

@Override

```
public void BorrowBook(){
    s=new Scanner(System.in);
    System.out.print("\nEnter the number of books you want to borrow: ");
    no1=s.nextInt();
    if(no1<np_books){
        System.out.print("Book issued successfully.....");
        np_books-=no1;
        Random r=new Random();
        int mon=r.nextInt(12);
        int day=r.nextInt(30);
        int yr=2018;
        System.out.print("\n Due date: "+day+" "+mon+" "+yr);}
    Else{
        System.out.println("Books not available!!!");}}
```

@Override

```
public void ReturnBook(){
    if(no1>0){
        s=new Scanner(System.in);
        int no;
        System.out.print("\nEnter the number of books you want to return: ");
        no=s.nextInt();
        np_books+=no;
        System.out.print("\n"+no+" Books returned successfully....");
    }
}
```

else

```
System.out.println("No Books borrowed!!!!"); }
```

@Override

```
public void Display(){
```

```
    s=new Scanner(System.in);
```

```
    System.out.println("Name: "+name);
```

```
    System.out.println("Register Number: "+regno);
```

```
    System.out.println("Department: "+department);
```

```
    System.out.println("No of books available: "+np_books);
```

```
    System.out.println("No of books borrowed: "+no1);} }
```

```
class Faculty implements Library{
```

```
    String empno;
```

```
    String name;
```

```
    String department;
```

```
    int np_books=150;
```

```
    Scanner s;
```

```
    public String getEmpno() {
```

```
        return empno;}
```

```
    public void setEmpno(String empno) {
```

```
        this.empno = empno;}
```

```
    public String getName() {
```

```
        return name;}
```

```
    public void setName(String name) {
```

```
        this.name = name;}
```

```
public String getDepartment() {
    return department;}

public void setDepartment(String department) {
    this.department = department;}

public int getNp_books() {
    return np_books;}

public void setNp_books(int np_books) {
    this.np_books = np_books;}

@Override

public void ReturnBook(){
    int no;
    s=new Scanner(System.in);
    System.out.print("\nEnter the number of books you want to return: ");
    no=s.nextInt();
    np_books+=no;
    System.out.print("\n"+no+" Books returned successfully....");}

int no1;

@Override

public void BorrowBook(){
    s=new Scanner(System.in);
    System.out.print("\nEnter the number of books you want to borrow: ");
    no1=s.nextInt();
    if(no1<np_books){
        System.out.print("\n Book issued..... ");
        np_books-=no1;
```

```
Random r=new Random();

int mon=r.nextInt(12);

int day=r.nextInt(30);

int yr=2018;

System.out.println("\n Due date: "+day+" "+mon+" "+yr);}

Else{

    System.out.println("Books not available!!!");}}

@Override

public void Display(){

    System.out.println("Name: "+name);

    System.out.println("Employee Number: "+empno);

    System.out.println("Department: "+department);

    System.out.println("No of books available: "+np_books);

    System.out.println("No of books borrowed: "+no1);}}

public class Ex6 {

    public static void main(String[] args) {

        Scanner s=new Scanner(System.in);

        boolean b,b2;

        b=true;

        b2=true;

        Faculty f[]= new Faculty[3];

        for(int i=0;i<3;i++){

            f[i]= new Faculty();}

        Student st[]= new Student[3];

        for(int i=0;i<3;i++){
```

```
        st[i]= new Student();}

OUTER: while(b){

    System.out.println("CHOICES TO DO.....");

    System.out.println("1.Library for Students\n2.Library for faculty\n3.Exit");

    System.out.print("\nEnter the choice: ");

    int ch;

    ch=s.nextInt();

    switch(ch){

        case 1:

            String name, department;

            String regno;

            System.out.print("\nAdd details for 3 students");

            for(int i=0;i<3;i++){

                System.out.println("\nEnter detail for student "+(i+1)+" : ");

                System.out.print("\nEnter Name of the student: ");

                name=s.next();

                System.out.print("\nEnter Register Number: ");

                regno=s.next();

                System.out.print("\nDepartment: ");

                department=s.next();

                st[i].setDepartment(department);

                st[i].setName(name);

                st[i].setRegno(regno);}

            int cnt=0;

            for(int i=0;i<3;i++){
```

```
while(b2){
    String id;
    System.out.print("\nEnter the student id to perform operation: ");
    id=s.next();
    for(int j=0;j<3;j++){
        if(id.equals(st[j].regno)){
            cnt++;
            System.out.println("\nPress...\n1.Borrow Book\n2.Return Book\n3.Display\n4.Exit");
            System.out.print("\nEnter the choice: ");
            int ch1;
            ch1=s.nextInt();
            switch(ch1){
                case 1:
                    st[j].BorrowBook();
                    break;
                case 2:
                    st[j].ReturnBook();
                    break ;
                case 3:
                    st[j].Display();
                    break;
                case 4:
                    b2=false;
                    continue OUTER;}
            }
        }
    }
}
```



```
if(cnt==0){
    System.out.println("Register number not found....Please try again...");
break;}

    case 2:

        System.out.println("Add details for 3 faculties");
for(int i=0;i<3;i++){

    System.out.println("\n\nEnter detail for faculty "+(i+1)+" : ");

    String name1,department1;

    String empno;

    System.out.print("\nEnter Name of the Faculty: ");

    name1=s.next();

    System.out.print("\nEnter Employee Number: ");

    empno=s.next();

    System.out.print("\nDepartment: ");

    department1=s.next();

    f[i].setDepartment(department1);

    f[i].setName(name1);

    f[i].setEmpno(empno);}

    int cnt1=0;

    while(b2){

        String id;

        System.out.print("\nEnter the Faculty id to perform operation: ");

        id=s.next();

        for(int j=0;j<3;j++){

            if(id.equals(f[j].empno)){
```

```
        cnt1++;

        System.out.println("\nPress...\n1.Borrow Book\n2.Return Book\n3.Display\n4.Exit");

        System.out.print("\nEnter the choice: ");

        int ch1;

        ch1=s.nextInt();

        switch(ch1){

            case 1:

                f[j].BorrowBook();

                break;

            case 2:

                f[j].ReturnBook();

                break ;

            case 3:

                f[j].Display();

                break;

            case 4:

                b2=false;

                }}}}

        if(cnt1==0){

            System.out.println("Register number not found....Please try again...");

            break;}

        case 3:

            b=false;

            }}}}

        }}}}

    }

}
```

Input & Output:

```
Output - ex6 (run) x
CHOICES TO DO.....
1.Library for Students
2.Library for faculty
3.Exit

Enter the choice: 1

Add details for 3 students

Enter detail for student 1:

Enter Name of the student: Justin
Enter Register Number: UR16CS213
Department: CSE

Enter detail for student 2:

Enter Name of the student: Jobin
Enter Register Number: UR16CE345
Department: CIVIL
```

```
Output - ex6 (run) x
Enter the student id to perform operation: UR16ME239

Press...
1.Borrow Book
2.Return Book
3.Display
4.Exit

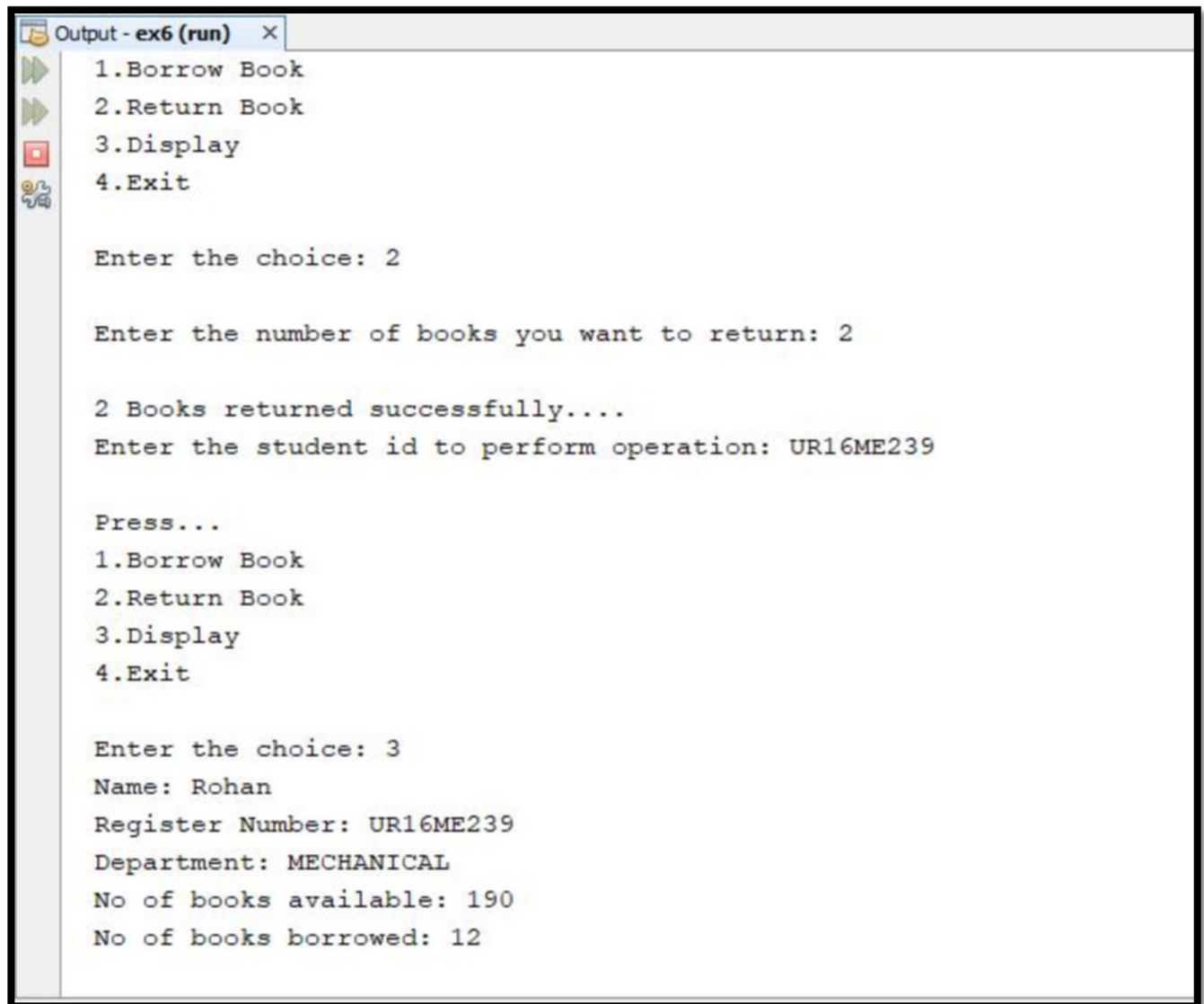
Enter the choice: 1

Enter the number of books you want to borrow: 12
Book issued successfully.....
Due date: 7 11 2018
Enter the student id to perform operation: UR16ME239

Press...
1.Borrow Book
2.Return Book
3.Display
4.Exit

Enter the choice: 2

Enter the number of books you want to return: 2
```



```
Output - ex6 (run) x
1.Borrow Book
2.Return Book
3.Display
4.Exit

Enter the choice: 2

Enter the number of books you want to return: 2

2 Books returned successfully....
Enter the student id to perform operation: UR16ME239

Press...
1.Borrow Book
2.Return Book
3.Display
4.Exit

Enter the choice: 3
Name: Rohan
Register Number: UR16ME239
Department: MECHANICAL
No of books available: 190
No of books borrowed: 12
```

Video URL:

<https://www.youtube.com/watch?v=JqomPFwVGJE&index=6&list=PL2ARJYFJqbcImMxZ0IOblv4a-9nBZrstY>

Result:

The program to create a menu driven java application to create an interface called Library and create two classes student and faculty both implementing the interface library is implemented successfully, and the output is verified.