

LAB EXERCISE ON PACKAGES

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COURSE CODE : - CSE 1007 LAB

COURSE : JAVA PROGRAMMING LAB

SLOT : L13-L14

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DATE : 9/03/2022

1) Create a class MATRIX in a package called <>. Include a read and print methods to input and output a matrix elements. This class should also include methods to add and subtract two matrices. Create a TestMatrix class in a default package and let this class to access all the methods of the class MATRIX.

File name : Matrix.java

Code

```
package sheral;

import java.util.Scanner;

public class Matrix

{

    private int m ;
    private int n ;
    int[][] mat1 = new int[m][n];
    int[][] mat2 = new int[m][n];
    int[][] add = new int[m][n];
    int[][] diff = new int[m][n];

    public Matrix(int m , int n)
    {
        this.m = m;
        this.n = n;
        this.mat1 = new int[m][n];
        this.mat2 = new int[m][n];
```

```
this.add = new int[m][n];
```

```
this.diff = new int[m][n];
```

```
}
```

```
public void read()
```

```
{
```

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

```
System.out.println("Enter elements of 1st matrix ");
```

```
for (int i=0;i<m;i++)
```

```
{
```

```
for (int j=0;j<n;j++)
```

```
{
```

```
mat1[i][j] = sc.nextInt();
```

```
}
```

```
}
```

```
System.out.println("Enter elements of 2nd matrix ");
```

```
for (int i=0;i<m ;i++)
```

```
{  
for (int j=0;j<n;j++)  
{  
mat2[i][j] = sc.nextInt();  
}  
}  
  
}
```

```
public void sub()  
{  
System.out.println("The difference of 2 matrices is : ");  
for (int i=0;i<m;i++)  
{  
for (int j=0;j<n;j++)  
{  
diff[i][j] = mat1[i][j] - mat2[i][j] ;  
System.out.print(diff[i][j] + " ");  
  
}
```

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

```
}
```

```
}
```

```
public void add()
```

```
{
```

```
System.out.println("The addition of 2 matrices is : ");
```

```
for (int i=0;i<m;i++)
```

```
{
```

```
for (int j=0;j<n;j++)
```

```
{
```

```
add[i][j] = mat1[i][j] + mat2[i][j] ;
```

```
System.out.print(add[i][j]+ " ");
```

```
}
```

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

```
}
```

```
}
```

```
public void print()
```

```
{
```

```
System.out.println("Matrix 1 elements are :\" );
```

```
for (int i=0;i<m;i++)
```

```
{
```

```
for (int j=0;j<n;j++)
```

```
{
```

```
System.out.print( mat1[i][j] + \" \") ;
```

```
}
```

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

```
}
```

```
System.out.println("Matrix 2 elements are :\" );
```

```
for (int i=0;i<m;i++)
```

```
{
```

```
for (int j=0;j<n;j++)  
{  
System.out.print( mat2[i][j] + " " ) ;  
  
}  
System.out.println();  
}  
  
}
```

File name : TestMatrix.java

Code :

```
import sheral.Matrix;  
  
class TestMatrix  
{  
  
public static void main(String[] args)
```

```
{  
  
Matrix m1 = new Matrix(3,4);  
  
m1.read();  
m1.print();  
m1.sub();  
m1.add();  
  
}  
}
```

Output :


```
D:\SEM 4\CSE1007_LAB\Matrix>javac -d . *.java
```

```
D:\SEM 4\CSE1007_LAB\Matrix>java TestMatrix
```

```
Enter elements of 1st matrix
```

```
25
```

```
21
```

```
28
```

```
29
```

```
27
```

```
36
```

```
28
```

```
39
```

```
55
```

```
59
```

```
74
```

```
37
```

```
Enter elements of 2nd matrix
```

```
19
```

```
15
```

```
16
```

```
11
```

```
14
```

```
12
```

```
21
```

```
25
```

```
23
```

```
17
```

```
29
```

```
35
```

```
Matrix 1 elements are :
```

```
25 21 28 29
```

```
27 36 28 39
```

```
55 59 74 37
```

```
Matrix 2 elements are :
```

```
19 15 16 11
```

```
14 12 21 25
```

```
23 17 29 35
```

```
The difference of 2 matrices is :
```

```
6 6 12 18
```

```
13 24 7 14
```

```
32 42 45 2
```

```
The addition of 2 matrices is :
```

```
44 36 44 40
```

```
41 48 49 64
```

```
78 76 103 72
```

```
D:\SEM 4\CSE1007_LAB\Matrix>javac -d . *.java
```

```
D:\SEM 4\CSE1007_LAB\Matrix>java TestMatrix
```

```
Enter elements of 1st matrix
```

```
25
```

```
21
```

```
28
```

```
29
```

```
27
```

```
36
```

```
28
```

```
39
```

```
55
```

```
59
```

```
74
```

```
37
```

```
Enter elements of 2nd matrix
```

```
19
```

```
15
```

```
16
```

```
11
```

```
14
```

```
12
```

```
21
```

```
25
```

```
23
```

```
17
```

```
29
```

```
35
```

```
Matrix 1 elements are :
```

```
25 21 28 29
```

```
27 36 28 39
```

```
55 59 74 37
```

```
Matrix 2 elements are :
```

```
19 15 16 11
```

```
14 12 21 25
```

```
23 17 29 35
```

```
The difference of 2 matrices is :
```

```
6 6 12 18
```

```
13 24 7 14
```

```
32 42 45 2
```

```
The addition of 2 matrices is :
```

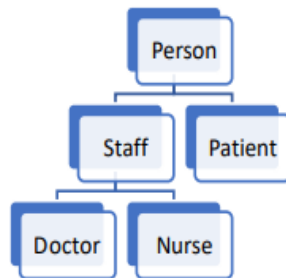
```
44 36 44 40
```

```
41 48 49 64
```

```
78 76 103 72
```

2)

Consider the inheritance model given below.



where each class is defined in a different package and the class **HospitalDatabase** has a list of patients, doctors and nurses defined in another package. This class should read and display the complete employee's and patients data of the hospital.

File name : Person.java

Code :

```
package p1;
```

```
import java.util.Scanner;
```

```
public class Person
{
```

```
String pname;
```

```
String padhaarno;
```

```
public Person()  
{  
    this.pname = pname;  
    this.padhaarno = padhaarno;  
  
}  
  
public void read()  
{  
    Scanner sc = new Scanner(System.in);  
    System.out.println("Enter name " );  
    pname = sc.next();  
    System.out.println("Enter adhaar no .");  
    padhaarno =sc.next();  
}  
  
public void print()  
{  
    System.out.println("Name is " + pname + "\nAdhaar  
no . is " + padhaarno );  
}
```

```
}
```

File name : Staff.java

Code :

```
package s1;
```

```
import p1.Person;
```

```
import java.util.Scanner;
```

```
public class Staff extends Person
```

```
{
```

```
int stno;
```

```
public Staff()
```

```
{
```

```
super();
```

```
this.stno = stno;
```

```
}
```

```
public void read()
```

```
{
```

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

```
super.read();
```

```
System.out.println("Enter staff id no. ");
```

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

```
}
```

```
public void print()
```

```
{
```

```
super.print();
```

```
System.out.println("Staff id no. is " + stno);
```

```
}
```

```
}
```

File name : Patient.java

```
package p2;
```

```
import java.util.Scanner;
```

```
import p1.Person;
```

```
public class Patient extends Person
```

```
{
```

```
    int name;
```

```
    String diagnosis;
```

```
    int pno;
```

```
    int wdnno;
```

```
    public Patient()
```

```
{
```

```
        super();
```

```
        this.diagnosis = diagnosis;
```

```
        this.pno = pno;
```

```
this.wdno = wdno ;  
}
```

```
public void read()  
{
```

```
    super.read();  
    Scanner sc = new Scanner(System.in);  
    System.out.println("Enter the type of diagnosis ");  
    diagnosis = sc.next();  
    System.out.println("Enter the patient id ");  
    pno = sc.nextInt();  
    System.out.println("Enter the ward no. ");  
    wdno = sc.nextInt();  
  
}
```

```
public void print()  
{  
    System.out.println("Details of the patient are ");
```



```
super.print();  
System.out.println("Diagnosis of the patient is : " +  
diagnosis);  
System.out.println("Ward number of the patient is : " +  
wdno);  
System.out.println("Patient id is : " + pno);  
}  
}
```

File name : Doctor.java

```
package d1;  
import s1.Staff;  
import java.util.Scanner;  
  
public class Doctor extends Staff  
{  
  
int roomno;  
String specialist;
```

```
public Doctor()  
{  
    super();  
    this.roomno = roomno;  
    this.specialist = specialist;  
}
```

```
public void read()  
{  
    super.read();  
    Scanner sc = new Scanner(System.in);  
    System.out.println("Enter the room no. ");  
    roomno = sc.nextInt();  
    System.out.println("Enter the type of specialisation ");  
    specialist = sc.next();  
}
```

```
public void print()  
{  
    System.out.println("Details of the doctor are " );
```

```
super.print();
```

```
System.out.println("Room no. of the doctor is " +  
roomno);
```

```
System.out.println("Doctor is specialised in " +  
specialist);
```

```
}
```

```
}
```

File name : Nurse.java

```
package n1;
```

```
import s1.Staff;
```

```
import java.util.Scanner;
```

```
public class Nurse extends Staff
```

```
{
```

```
int wdnno;
```

```
public Nurse()
```

```
{  
    super();  
    this.wdno = wdno;  
}
```

```
public void read()  
{  
    super.read();  
    Scanner sc = new Scanner(System.in);  
    System.out.println("Enter ward number ");  
    wdno = sc.nextInt();  
}
```

```
public void print()  
{  
    System.out.println("Details of the nurse are as follows  
");  
    super.print();  
    System.out.println("The ward no. is " + wdno);  
}
```

```
}
```

File name : HospitalDatabase.java

```
package h;
```

```
import p1.Person;
```

```
import s1.Staff;
```

```
import n1.Nurse;
```

```
import d1.Doctor;
```

```
import p2.Patient;
```

```
public class HospitalDatabase
```

```
{
```

```
public static void main(String[] args)
```

```
{
```

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

```
Doctor[] d = new Doctor[2];
```

```
for (int i=0;i<d.length;i++)  
{  
    d[i] = new Doctor();  
    d[i].read();  
    d[i].print();  
    System.out.println();  
}
```

```
System.out.println("\n");  
Patient[] p1 = new Patient[2];  
for(int i=0;i<p1.length;i++)  
{  
    p1[i]= new Patient();  
    p1[i].read();  
    p1[i].print();  
    System.out.println();  
}
```

```
System.out.println("\n");  
Nurse[] n = new Nurse[2];
```

```
for(int i=0;i<n.length;i++)  
{  
    n[i]= new Nurse();  
    n[i].read();  
    n[i].print();  
    System.out.println();  
  
}  
  
}  
}
```

Output :

```
D:\SEM 4\CSE1007_LAB\Hospital>javac -d . *.java

D:\SEM 4\CSE1007_LAB\Hospital>java h.HospitalDatabase

Enter name
Sheral
Enter adhaar no .
8657489345
Enter staff id no.
2214
Enter the room no.
45
Enter the type of specialisation
Oncology
Details of the doctor are
Name is Sheral
Adhaar no . is 8657489345
Staff id no. is 2214
Room no. of the doctor is 45
Doctor is specialised in Oncology

Enter name
Sheetal
Enter adhaar no .
3434562211
Enter staff id no.
6645
Enter the room no.
25
Enter the type of specialisation
Dermatology
Details of the doctor are
Name is Sheetal
Adhaar no . is 3434562211
Staff id no. is 6645
Room no. of the doctor is 25
Doctor is specialised in Dermatology
```



```
Enter name
Riya
Enter adhaar no .
8533534467
Enter the type of diagnosis
Cancer
Enter the patient id
8834
Enter the ward no.
670
Details of the patient are
Name is Riya
Adhaar no . is 8533534467
Diagnosis of the patient is : Cancer
Ward number of the patient is : 670
Patient id is : 8834
```

```
Enter name
Sakshi
Enter adhaar no .
6339299929
Enter the type of diagnosis
Eczema
Enter the patient id
4563
Enter the ward no.
765
Details of the patient are
Name is Sakshi
Adhaar no . is 6339299929
Diagnosis of the patient is : Eczema
Ward number of the patient is : 765
Patient id is : 4563
```

```
Enter name
Geeta
Enter adhaar no .
6654753456
Enter staff id no.
4562
Enter ward number
670
Details of the nurse are as follows
Name is Geeta
Adhaar no . is 6654753456
Staff id no. is 4562
The ward no. is 670
```

```
Enter name
Sarita
Enter adhaar no .
3345893223
Enter staff id no.
8583
Enter ward number
765
Details of the nurse are as follows
Name is Sarita
Adhaar no . is 3345893223
Staff id no. is 8583
The ward no. is 765
```