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week-7

Packages

Q1.

MATRIX.java

```
package Anupam;
import java.util.Scanner;
public class MATRIX{
    public int[][] arr = new int[3][3];
    int i,j;
    public MATRIX(){
        for(i=0;i<3;i++){
            for(j=0;j<3;j++){
                arr[i][j] = 0;
            }
        }
    }
    public void readArr(){
        Scanner in = new Scanner(System.in);
        for(i=0;i<3;i++){
            for(j=0;j<3;j++){
                arr[i][j] = in.nextInt();
            }
        }
    }
    public void printArr(){
        for(i=0;i<3;i++){
            for(j=0;j<3;j++){
                System.out.print(arr[i][j]+" ");
            }
            System.out.println();
        }
    }
    public int[][] addArray(int[][] arr2){
        int[][] sum = new int[3][3];
        for(i=0;i<3;i++){
            for(j=0;j<3;j++){
```

```

sum[i][j] = arr[i][j]+arr2[i][j];
}
}
return sum;
}
public int[][] subArray(int[][] arr2){
int[][] diff = new int[3][3];
for(i=0;i<3;i++){
for(j=0;j<3;j++){
diff[i][j] = arr[i][j]-arr2[i][j];
}
}
return diff;
}
}

```

testMatrix.java

```

import Anupam.MATRIX;
public class testMatrix{
public static void main(String[] args) {
MATRIX obj1 = new MATRIX();
MATRIX obj2 = new MATRIX();
MATRIX sum = new MATRIX();
MATRIX diff = new MATRIX();
System.out.println("\nEnter matrix1 elements : ");
obj1.readArr();
System.out.println("\nMatrix 1 elements are : ");
obj1.printArr();
System.out.println("\nEnter matrix2 elements : ");
obj2.readArr();
System.out.println("\nMatrix 2 elements are : ");
obj2.printArr();
System.out.println("\nThe sum is : ");
sum.arr = obj1.addArray(obj2.arr);
sum.printArr();
System.out.println("\nThe difference is : ");
diff.arr = obj1.subArray(obj2.arr);
diff.printArr();
}
}

```

Output :

```
testMatrix.java - Untitled (Workspace) - Visual Studio Code
File Edit Selection View Go Run Terminal Help
PROBLEMS 44 OUTPUT DEBUG CONSOLE TERMINAL 1: bash
piratepanda@SastaPC:~/Documents/javalab/week7/Packages/question1$ javac -d . MATRIX.java
piratepanda@SastaPC:~/Documents/javalab/week7/Packages/question1$ javac testMatrix.java
piratepanda@SastaPC:~/Documents/javalab/week7/Packages/question1$ java testMatrix

Enter matrix1 elements :
1
2
3
4
5
6
7
8
9

Matrix 1 elements are :
1 2 3
4 5 6
7 8 9
```

```
testMatrix.java - Untitled (Workspace) - Visual Studio Code
File Edit Selection View Go Run Terminal Help
PROBLEMS 44 OUTPUT DEBUG CONSOLE TERMINAL 1: bash

Enter matrix2 elements :
9
8
7
6
5
4
3
2
1

Matrix 2 elements are :
9 8 7
6 5 4
3 2 1

The sum is :
10 10 10
10 10 10
10 10 10

The difference is :
-8 -6 -4
-2 0 2
4 6 8
piratepanda@SastaPC:~/Documents/javalab/week7/Packages/question1$
```

Q2.

person.java

```
package pack1;

public class person {
    public String name;
    public String sex;
    public int age;

    public person(String n, String s, int a){
        name = n;
        sex = s;
        age = a;
    }
}
```

staff.java

```
package pack2;

import pack1.person;

public class staff extends person {
    public String dateOfJoin;
    public int salary;
    public staff(String name,String sex,int age,String doj,int sal){
        super(name,sex,age);
        dateOfJoin = doj;
        salary = sal;
    }
}
```

patient.java

```
package pack3;

import pack1.person;

public class patient extends person{
```

```

String condition;
int bill;
public patient(String name,String sex,int age,String cond,int b){
super(name,sex,age);
condition = cond;
bill = b;
}
public void display(){
System.out.println("Name = "+name);
System.out.println("Gender = "+sex);
System.out.println("Age = "+age);
System.out.println("Condition = "+condition);
System.out.println("Bill = "+bill);
}
}

```

doctor.java

```

package pack4;

import pack2.staff;

public class doctor extends staff{
String qualification;
String specialisation;
public doctor(String name,String sex,int age,String dateOfJoin,int salary,String
qual,String spec){
super(name,sex,age,dateOfJoin,salary);
qualification = qual;
specialisation = spec;
}
public void display(){
System.out.println("Name = "+name);
System.out.println("Gender = "+sex);
System.out.println("Age = "+age);
System.out.println("Date of joining = "+dateOfJoin);
System.out.println("Salary = "+salary);
System.out.println("Qualification = "+qualification);
System.out.println("Specialisation = "+specialisation);
}
}

```

nurse.java

```
package pack5;

import pack2.staff;

public class nurse extends staff{
    String type;
    int shift;
    public nurse(String name,String sex,int age,String dateOfJoin,int salary,String
    t,int sh){
        super(name,sex,age,dateOfJoin,salary);
        type = t;
        shift = sh;
    }
    public void display(){
        System.out.println("Name = "+name);
        System.out.println("Gender = "+sex);
        System.out.println("Age = "+age);
        System.out.println("Date of joining = "+dateOfJoin);
        System.out.println("Salary = "+salary);
        System.out.println("Nurse Type = "+type);
        System.out.println("Hours per day = "+shift);
    }
}
```

HospitalDatabase.java

```
package mainPack;

import pack4.doctor;
import pack5.nurse;
import pack3.patient;

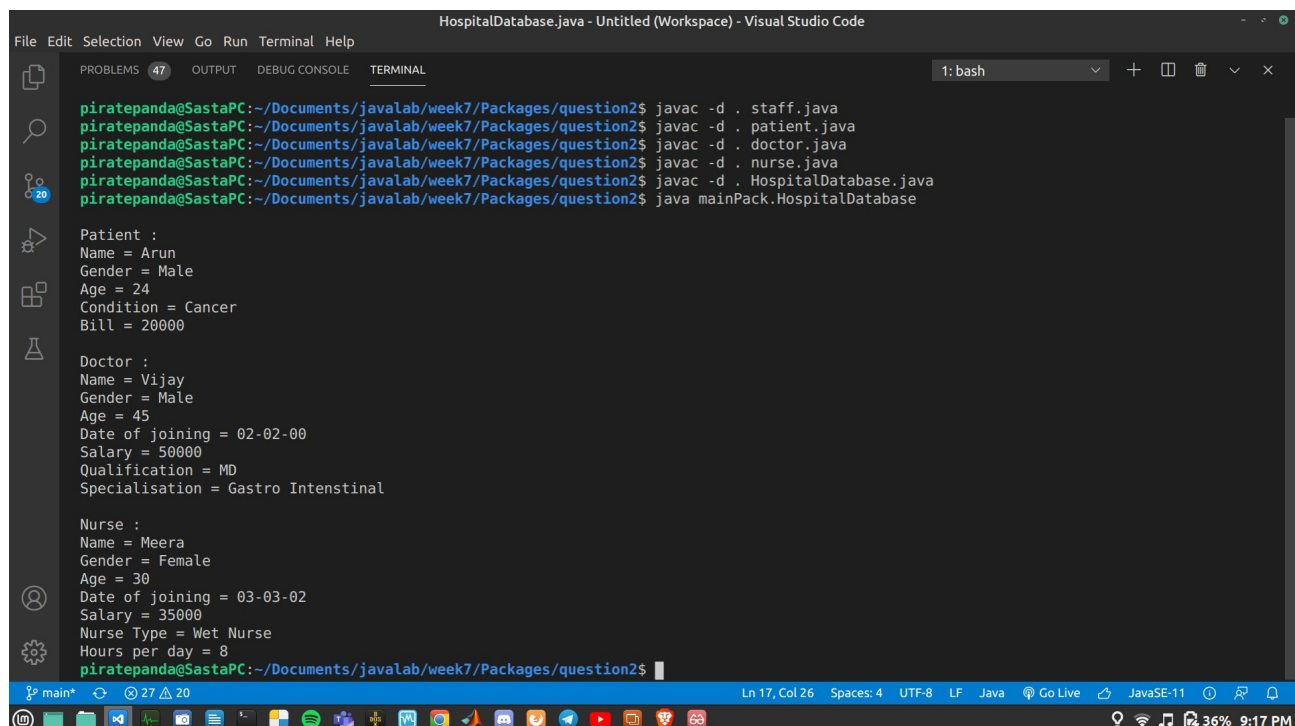
public class HospitalDatabase{
    public static void main(String[] args) {
        System.out.println("\nPatient : ");
        patient patient1 = new patient("Arun","Male",24,"Cancer",20000);
        patient1.display();
        System.out.println("\nDoctor : ");
    }
}
```

```

doctor doctor1 = new doctor("Vijay","Male",45,"02-02-
00",50000,"MD","Gastro Intenstinal");
doctor1.display();
System.out.println("\nNurse : ");
nurse nurse1 = new nurse("Meera","Female",30,"03-03-02",35000,"Wet
Nurse",8);
nurse1.display();
}
}

```

Output :



```

HospitalDatabase.java - Untitled (Workspace) - Visual Studio Code
File Edit Selection View Go Run Terminal Help
PROBLEMS 47 OUTPUT DEBUG CONSOLE TERMINAL 1: bash
piratepanda@SastaPC:~/Documents/javablab/week7/Packages/question2$ javac -d . staff.java
piratepanda@SastaPC:~/Documents/javablab/week7/Packages/question2$ javac -d . patient.java
piratepanda@SastaPC:~/Documents/javablab/week7/Packages/question2$ javac -d . doctor.java
piratepanda@SastaPC:~/Documents/javablab/week7/Packages/question2$ javac -d . nurse.java
piratepanda@SastaPC:~/Documents/javablab/week7/Packages/question2$ javac -d . HospitalDatabase.java
piratepanda@SastaPC:~/Documents/javablab/week7/Packages/question2$ java mainPack.HospitalDatabase

Patient :
Name = Arun
Gender = Male
Age = 24
Condition = Cancer
Bill = 20000

Doctor :
Name = Vijay
Gender = Male
Age = 45
Date of joining = 02-02-00
Salary = 50000
Qualification = MD
Specialisation = Gastro Intenstinal

Nurse :
Name = Meera
Gender = Female
Age = 30
Date of joining = 03-03-02
Salary = 35000
Nurse Type = Wet Nurse
Hours per day = 8
piratepanda@SastaPC:~/Documents/javablab/week7/Packages/question2$

```

Interfaces

Q1.

```

interface volume{
public void innerVolume();
public void outerVolume();
}

```

```

class part implements volume{
double s1,s2,s3,iV,oV;

```

```

public part(double side1,double side2,double side3){
s1 = side1;
s2 = side2;
s3 = side3;
iV = 0.0;
oV = 0.0;
}
public void innerVolume(){
iV = (1.0/3.0)*(22.0/7.0)*s1*s2*s3;
}
public void outerVolume(){
oV = (4.0/3.0)*(22.0/7.0)*s1*s2*s3;
}
public void show(){
System.out.println("Inner volume = "+iV);
System.out.println("Outer Volume = "+oV);
}
}

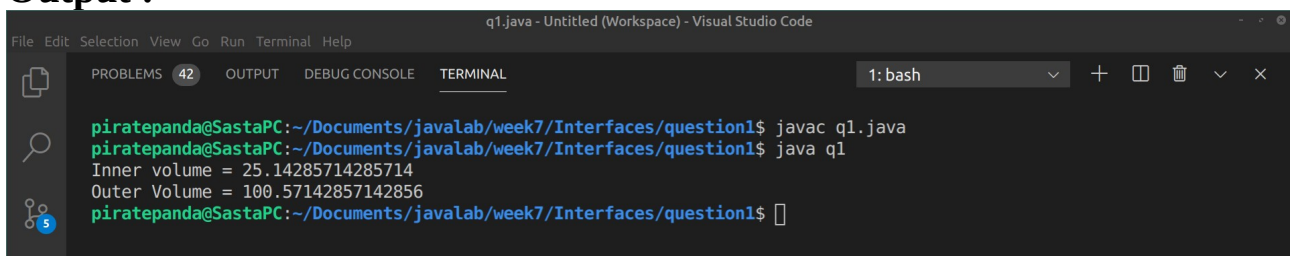
```

```

public class q1 {
public static void main(String[] args) {
part obj = new part(2,3,4);
obj.innerVolume();
obj.outerVolume();
obj.show();
}
}

```

Output :



```

q1.java - Untitled (Workspace) - Visual Studio Code
File Edit Selection View Go Run Terminal Help
PROBLEMS 42 OUTPUT DEBUG CONSOLE TERMINAL 1: bash
piratepanda@SastaPC:~/Documents/javab/week7/Interfaces/question1$ javac q1.java
piratepanda@SastaPC:~/Documents/javab/week7/Interfaces/question1$ java q1
Inner volume = 25.14285714285714
Outer Volume = 100.57142857142856
piratepanda@SastaPC:~/Documents/javab/week7/Interfaces/question1$ 

```

.

Q2.

animal.java


```
abstract class animal{
protected int legs;
protected animal(int l){
legs = l;
}
public void walk(){
System.out.println("Walking on "+legs+" legs");
}
public abstract void eat();
}
```

pet.java

```
interface pet{
public String getName();
public void setName(String n);
public void play();
}
```

spider.java

```
public class spider extends animal{
public spider(){
super(8);
}
public void eat(){
System.out.println("Spider is eating.");
}
}
```

cat.java

```
public class cat extends animal implements pet{
String name;
public cat(String n){
super(4);
name = n;
}
public cat(){
this("");
}
public String getName(){
```

```
return name;
}
public void setName(String n){
name = n;
}
public void play(){
System.out.println("Cat is playing.");
}
public void eat(){
System.out.println("Cat is eating.");
}
}
```

fish.java

```
public class fish extends animal implements pet{
public fish(){
super(0);
}
public void walk(){
System.out.println("Fish can't walk.They have "+legs+" legs");
}
public String getName(){
return null;
}
public void setName(String n){
}
public void play(){
System.out.println("Fish is playing.");
}
public void eat(){
System.out.println("Fish is eating.");
}
}
```

testAnimals.java

```
public class testAnimals{
public static void main(String[] args) {
fish d = new fish();
cat c = new cat("Fluffy");
animal a = new fish();
}
```

```
animal e = new spider();
pet p = new cat();
System.out.println();
d.play();
d.eat();
d.walk();
d.setName("Albert");
System.out.println("Name = "+d.getName());
System.out.println();
c.play();
c.eat();
c.walk();
System.out.println("Name = "+c.getName());
c.setName("Tom");
System.out.println("Name = "+c.getName());
System.out.println();
a.eat();
a.walk();
System.out.println();
e.eat();
e.walk();
System.out.println();
p.play();
p.setName("Robin");
System.out.println("Name = "+p.getName());
}
}
```

Output :

```
testAnimals.java - Untitled (Workspace) - Visual Studio Code
File Edit Selection View Go Run Terminal Help
PROBLEMS 47 OUTPUT DEBUG CONSOLE TERMINAL 1: bash
piratepanda@SastaPC:~/Documents/javablab/week7/Interfaces/question2$ javac spider.java
piratepanda@SastaPC:~/Documents/javablab/week7/Interfaces/question2$ javac cat.java
piratepanda@SastaPC:~/Documents/javablab/week7/Interfaces/question2$ javac fish.java
piratepanda@SastaPC:~/Documents/javablab/week7/Interfaces/question2$ javac testAnimals.java
piratepanda@SastaPC:~/Documents/javablab/week7/Interfaces/question2$ java testAnimals

Fish is playing.
Fish is eating.
Fish can't walk.They have 0 legs
Name = null

Cat is playing.
Cat is eating.
Walking on 4 legs
Name = Fluffy
Name = Tom

Fish is eating.
Fish can't walk.They have 0 legs

Spider is eating.
Walking on 8 legs

Cat is playing.
Name = Robin
piratepanda@SastaPC:~/Documents/javablab/week7/Interfaces/question2$
```