21BDS0340

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Java

Lab Assessment 3

Question 1

Code:

```
import java.util.Scanner;

public class Question1 {
    public static void main(String[] args) {
        Scanner s = new Scanner(System.in);
        int n = s.nextInt();
        for (int x = 1; x <= n; x++) {
            for (int y = 0; y < x; y++)
                System.out.print("* ");
            System.out.println("");
        }
        s.close();
    }
}
```

Output:

```
5
*
* *
* * *
* * * *
* * * * *
```

Question 2

Code:

```
import java.util.Scanner;

public class Question2 {
    public static void main(String[] args) {
        Scanner s = new Scanner(System.in);
        int n = s.nextInt();
        int arr[] = new int[n];
        for (int x = 0; x < n; x++)
            arr[x] = s.nextInt();
        int diff, num1 = 0, num2 = 0, min = Integer.MAX_VALUE;
        for (int x = 0; x < n - 1; x++)
            for (int y = x + 1; y < n; y++) {
                diff = Math.abs(arr[x] + arr[y]);
                if (diff < min) {
                    min = diff;
                    num1 = arr[x];
                    num2 = arr[y];
                }
            }
        System.out.println(num1 + "\n" + num2);
        s.close();
    }
}
```

Output:

```
7
-1
6
3
9
0
-5
2
-1
0
```

Question 3

Code:

```
import java.util.Scanner;

public class Question3 {
    public static void main(String[] args) {
        Scanner s = new Scanner(System.in);
        int n = s.nextInt();
        int mat[][] = new int[n][n];
        for (int x = 0; x < n; x++)
            for (int y = 0; y < n; y++)
                mat[x][y] = s.nextInt();
        for (int x = 0; x < n; x++) {
            int temp = mat[x][n - x - 1];
            mat[x][n - x - 1] = mat[x][x];
            mat[x][x] = temp;
        }
        for (int x = 0; x < n; x++) {
            for (int y = 0; y < n; y++)
                System.out.print(mat[x][y] + " ");
            System.out.println("");
        }
        s.close();
    }
}
```

Output:

```
3
1
2
3
4
5
6
7
8
9
3 2 1
4 5 6
9 8 7
```

Question 4

Code:

```
import java.util.Scanner;

public class Question4 {
    public static void main(String[] args) {
        Scanner s = new Scanner(System.in);
        int m = s.nextInt(), n = s.nextInt();
        int mat[][] = new int[m][n];
        for (int x = 0; x < m; x++)
            for (int y = 0; y < n; y++)
                mat[x][y] = s.nextInt();
        int sum[] = new int[m];
        for (int x = 0; x < n; x++) {
            for (int y = 0; y < m; y++) {
                System.out.print(mat[y][x] + " ");
                sum[y] += mat[y][x];
            }
            System.out.println("");
        }
        System.out.println("----");
        for (int x = 0; x < m; x++)
            System.out.print(sum[x] + " ");
        s.close();
    }
}
```

Output:

```
2
3
1
2
3
4
5
6
1 4
2 5
3 6
----
6 15
```

Question 5

Code:

```
import java.util.Scanner;

public class Question5 {
   public static void main(String[] args) {
      Scanner s = new Scanner(System.in);
      String str = s.nextLine().trim();
      String words[] = str.split(" ");
      int count = 0;
      for (int x = 0; x < words.length - 1; x++) {
         boolean flag = true;
         for (int y = x + 1; y < words.length; y++)
            if (words[x].equals(words[y]))
               flag = false;
         if (flag)
            count++;
      }
      System.out.println(count + 1);
      s.close();
   }
}
```

Output:

```
vellore institute of technology is a university in a place called vellore
10
```

Question 6

Code:

```java
import java.util.Scanner;

public class Question6 {
    public static void main(String[] args) {
        Scanner s = new Scanner(System.in);
        int a1 = s.nextInt(), a2 = s.nextInt(), b1 = s.nextInt(), b2 = s.nextInt();
        System.out.println(a1 + "+" + a2 + "i");
        System.out.println(b1 + "+" + b2 + "i");
        System.out.println((a1 + b1) + "+" + (a2 + b2) + "i");
        System.out.println((a1 - b1) + "+" + (a2 - b2) + "i");
        s.close();
    }
}
```

Output:

```
1
2
3
4
1+2i
3+4i
4+6i
-2+-2i
```

Question 7

Code:

```
import java.util.Scanner;

public class Question7 {
    public static void main(String[] args) {
        Scanner s = new Scanner(System.in);
        String word = s.next();
        StringBuilder sb = new StringBuilder(word);
        String rep = s.next();
        int t1 = s.nextInt(), f1 = s.nextInt();
        int t2 = s.nextInt(), f2 = s.nextInt();
        sb.replace(t1, f1, rep);
        System.out.println(word + "\n" + sb);
        sb.delete(t2, f2);
        System.out.println(sb);
        s.close();
    }
}
```

Output:

```
hi
1
2
3
4
hello
hhillo
hhilo
```

Question 8

Code:

```
import java.util.Scanner;

public class Question8 {
    public static void main(String[] args) {
        Scanner s = new Scanner(System.in);
        Cow cow = new Cow(s.next(), s.next());
        Cat cat = new Cat(s.next(), s.next());
        Dog dog = new Dog(s.next());
        cow.displaySound();
        cat.displaySound();
        dog.display();
        s.close();
    }
}

class Animal {
    String type = "Animal";
    String sound = "Sound";
    String eat = "Food it likes";
}

class Cow extends Animal {
    String name = "Cow";

    Cow(String sound, String eat) {
        this.sound = sound;
        this.eat = eat;
    }

    void displaySound() {
        System.out.println(this.name + " makes a " + this.sound + " sound and eats
" + this.eat);
    }
}

class Cat extends Animal {
    String name = "Cat";

    Cat(String sound, String eat) {
        this.sound = sound;
        this.eat = eat;
    }

    void displaySound() {
        System.out.println(this.name + " makes a " + this.sound + " sound and eats
" + this.eat);
    }
```

```
}

class Dog extends Animal {
    String name;

    Dog(String name) {
        this.name = name;
    }

    void display() {
        System.out.println(this.name + " is the dogs name");
    }
}
```

Output:

```
moo
grass
meow
kibble
Ginger
Cow makes a moo sound and eats grass
Cat makes a meow sound and eats kibble
Ginger is the dogs name
```

Question 9

Code:

```
import java.util.Scanner;

public class Question9 {
    public static void main(String[] args) {
        Scanner s = new Scanner(System.in);
        Truck t = new Truck(s.next(), s.nextInt());
        Car c = new Car(s.next(), s.nextInt());
        t.display();
        t.vehicleManufacturer();
        c.display();
        c.vehicleManufacturer();
        s.close();
    }
}

class Vehicle {
    String purpose;
    int wheels;

    void vehicleManufacturer() {
        System.out.println("The name of the vehicle manufacturer is Benz.");
    }
}

class Truck extends Vehicle {
    String name = "Truck";

    Truck(String purpose, int wheels) {
        this.purpose = purpose;
        this.wheels = wheels;
    }

    void display() {
        System.out.println(this.name + " has " + this.wheels + " wheels and is used
for " + this.purpose);
    }

    void vehicleManufacturer() {
        System.out.println("The name of the vehicle manufacturer is Tata");
    }
}

class Car extends Vehicle {
    String name = "Car";

    Car(String purpose, int wheels) {
        this.purpose = purpose;
```

```
        this.wheels = wheels;
    }

    void display() {
        System.out.println(this.name + " has " + this.wheels + " wheels and is used
for " + this.purpose);
    }

    void vehicleManufacturer() {
        System.out.println("The name of the vehicle manufacturer is Jaguar");
    }
}
```

Output:

```
transport
18
joyrides
4
Truck has 18 wheels and is used for transport
The name of the vehicle manufacturer is Tata
Car has 4 wheels and is used for joyrides
The name of the vehicle manufacturer is Jaguar
```

Question 10

Code:

```
import java.util.Scanner;

public class Question10 {
    public static int mult(int a, int b) {
        return a * b;
    }

    public static float mult(float a, float b) {
        return a * b;
    }

    public static double mult(double a, double b) {
        return a * b;
    }

    public static int sub(int a, int b) {
        return a - b;
    }

    public static float sub(float a, float b) {
        return a - b;
    }

    public static double sub(double a, double b) {
        return a - b;
    }

    public static void main(String[] args) {
        Scanner s = new Scanner(System.in);
        System.out.println(mult(s.nextInt(), s.nextInt()) + "\n" +
mult(s.nextFloat(), s.nextFloat()) + "\n"
                + mult(s.nextDouble(), s.nextDouble()));
        System.out.println(sub(s.nextInt(), s.nextInt()) + "\n" +
sub(s.nextFloat(), s.nextFloat()) + "\n"
                + sub(s.nextDouble(), s.nextDouble()));
        s.close();
    }
}
```

Output:

```
1
2
3
4
5
6
2
12.0
30.0
1
2
3
4
5
6
-1
-1.0
-1.0
```

Question 11

Code:

```
import java.util.Scanner;

public class Question11 {
    public static void main(String[] args) throws FirstDigitNotSameException {
        Scanner s = new Scanner(System.in);
        int a = s.nextInt(), b = s.nextInt();
        s.close();
        while (a / 10 != 0)
            a /= 10;
        while (b / 10 != 0)
            b /= 10;
        if (a != b)
            throw new FirstDigitNotSameException("First digits of numbers are not
same");
    }
}

class FirstDigitNotSameException extends Exception {
    FirstDigitNotSameException(String s) {
        super(s);
    }
}
```

Output:

```
12345
23456
Exception in thread "main" FirstDigitNotSameException:
 First digits of numbers are not same
        at Question11.main(Question11.java:13)
```

Question 12

Code:

```java
import java.util.Scanner;

import printstring.PrintString;

public class Question12 {
    public static void main(String[] args) {
        Scanner s = new Scanner(System.in);
        PrintString ps = new PrintString();
        ps.display(s.next());
        s.close();
    }
}
```

printstring/PrintString.java

```java
package printstring;

public class PrintString {
    public void display(String s) {
        System.out.println(s);
    }
}
```

Output:

```
papaya
papaya
```

Question 13

Code:

```java
import java.util.Scanner;

import mypack.math.Complex;

public class Question13 {
    public static void main(String[] args) {
        Scanner s = new Scanner(System.in);
        Complex c1 = new Complex(s.nextDouble(), s.nextDouble());
        Complex c2 = new Complex(s.nextDouble(), s.nextDouble());
        Complex sum = c1.add(c2);
        Complex diff = c1.sub(c2);
        System.out.println("Sum: " + sum.toString());
        System.out.println("Difference: " + diff.toString());
        s.close();
    }
}
```

mypack/math/Complex.java

```java
package mypack.math;

public class Complex {
    double a, b;

    public Complex(double a, double b) {
        this.a = a;
        this.b = b;
    }

    public Complex add(Complex c) {
        return new Complex(a + c.a, b + c.b);
    }

    public Complex sub(Complex c) {
        return new Complex(a - c.a, b - c.b);
    }

    public String toString() {
        return Double.toString(a) + "+" + Double.toString(b) + "i";
    }
}
```

Output:

```
1
2
3
4
Sum: 4.0+6.0i
Difference: -2.0+-2.0i
```

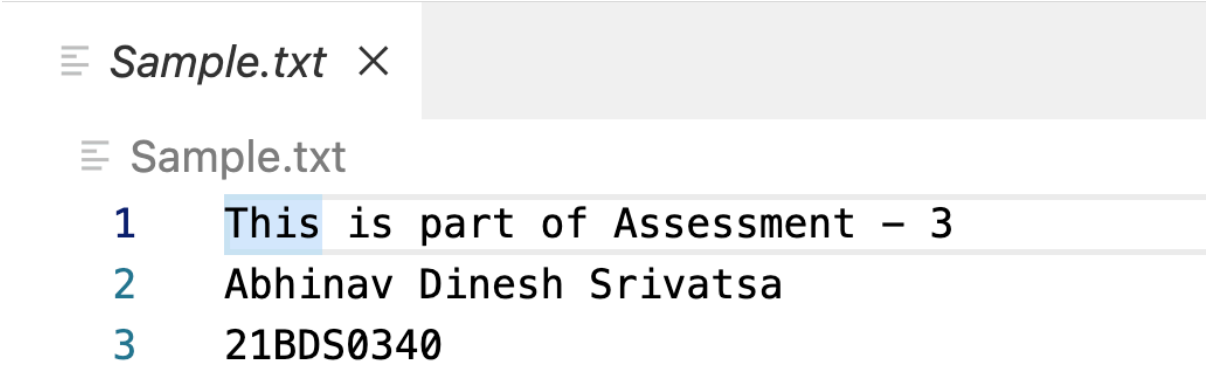
Question 14

Code:

```
import java.io.File;
import java.io.PrintWriter;
import java.util.Scanner;

public class Question14 {
    public static void main(String[] args) {
        Scanner s = new Scanner(System.in);
        try {
            PrintWriter pw = new PrintWriter(new File("Sample.txt"));
            pw.write("This is part of Assessment - 3\nAbhinav Dinesh
Srivatsa\n21BDS0340");
            pw.close();
        } catch (Exception e) {
            System.out.println(e.getMessage());
        }
        s.close();
    }
}
```

Output:



Question 15

Code:

```
import java.io.File;
import java.util.Scanner;

public class Question15 {
    public static void main(String[] args) {
        try {
            Scanner s = new Scanner(new File("Sample.txt"));
            while (s.hasNext())
                System.out.println(s.nextLine().trim());
            s.close();
        } catch (Exception e) {
            System.out.println(e.getMessage());
        }
    }
}
```

Output:

```
This is part of Assessment - 3
Abhinav Dinesh Srivatsa
21BDS0340
```