JAVA

PRACTICE

SECTION-4

To create a class ComputeMethods that utilizes the java.util.Random class, you might want to implement methods that perform various computations or generate random data. Below are some examples of what you can include in this class:

Example 1: Generate Random Numbers and Basic Computations

1. Generating Random Integers and Doubles:

o Methods to generate random integers within a range.

o Methods to generate random doubles within a range.

2. Computations Using Random Numbers:

o Methods to compute the sum, average, or other statistics using generated random numbers.

Here’s a complete example of the ComputeMethods class:

```
import java.util.Random;
public class ComputeMethods {
private Random random;
public ComputeMethods() {
// Initialize the Random object
random = new Random();
}
// Method to generate a random integer between min and max
(inclusive)
public int getRandomInt(int min, int max) {
```

```
return random.nextInt((max - min) + 1) + min;
}

// Method to generate a random double between min and max
public double getRandomDouble(double min, double max) {
return min + (max - min) * random.nextDouble();
}
// Method to compute the average of an array of integers
public double computeAverage(int[] numbers) {
if (numbers.length == 0) return 0;
int sum = 0;
for (int number : numbers) {
sum += number;
}
return (double) sum / numbers.length;
}

// Method to compute the sum of an array of doubles
public double computeSum(double[] numbers) {
double sum = 0.0;
for (double number : numbers) {
sum += number;
}

return sum;
}

// Method to generate an array of random integers
```

```
public int[] generateRandomIntArray(int size, int min, int max) {
int[] array = new int[size];
for (int i = 0; i &lt; size; i++) {
array[i] = getRandomInt(min, max);
}
return array;
}
// Method to generate an array of random doubles
public double[] generateRandomDoubleArray(int size, double min,
double max) {
double[] array = new double[size];
for (int i = 0; i &lt; size; i++) {
array[i] = getRandomDouble(min, max);
}
return array;
}
public static void main(String[] args) {
ComputeMethods cm = new ComputeMethods();
// Generate random numbers and compute results

int[] intArray = cm.generateRandomIntArray(5, 1, 100);
double[] doubleArray = cm.generateRandomDoubleArray(5, 0.0,
1.0);
System.out.println(&quot;Random Integers:&quot;);
for (int num : intArray) {
System.out.print(num + &quot; &quot;);
}
System.out.println(&quot;\nAverage of Integers: &quot; +
cm.computeAverage(intArray));
System.out.println(&quot;\nRandom Doubles:&quot;);
for (double num : doubleArray) {
System.out.print(num + &quot; &quot;);
}
System.out.println(&quot;\nSum of Doubles: &quot; +
cm.computeSum(doubleArray));
}
}
```

CODE:

```
import java.util.Random;

public class ComputeMethods {
    private Random random;

    // Constructor to initialize the Random object
    public ComputeMethods() {
        random = new Random();
    }

    // Method to generate a random integer between min and max (inclusive)
    public int getRandomInt(int min, int max) {
        return random.nextInt((max - min) + 1) + min;
    }

    // Method to generate a random double between min and max
```

```
public double getRandomDouble(double min, double max) {
    return min + (max - min) * random.nextDouble();
}

// Method to compute the average of an array of integers
public double computeAverage(int[] numbers) {
    if (numbers.length == 0) return 0;
    int sum = 0;
    for (int number : numbers) {
        sum += number;
    }
    return (double) sum / numbers.length;
}

// Method to compute the sum of an array of doubles
public double computeSum(double[] numbers) {
    double sum = 0.0;
    for (double number : numbers) {
        sum += number;
    }
    return sum;
}

// Method to generate an array of random integers
public int[] generateRandomIntArray(int size, int min, int max) {
    int[] array = new int[size];
    for (int i = 0; i < size; i++) {
        array[i] = getRandomInt(min, max);
    }
    return array;
}

// Method to generate an array of random doubles
public double[] generateRandomDoubleArray(int size, double min, double max) {
    double[] array = new double[size];
    for (int i = 0; i < size; i++) {
        array[i] = getRandomDouble(min, max);
    }
    return array;
}

// Main method to test the functionality of the ComputeMethods class
public static void main(String[] args) {
    ComputeMethods cm = new ComputeMethods();

    // Generate random numbers and compute results
    int[] intArray = cm.generateRandomIntArray(5, 1, 100);
    double[] doubleArray = cm.generateRandomDoubleArray(5, 0.0, 1.0);

    System.out.println("Random Integers:");
    for (int num : intArray) {
        System.out.print(num + " ");
    }

    System.out.println("\nAverage of Integers: " + cm.computeAverage(intArray));
```

```
        System.out.println("Random Doubles:");
        for (double num : doubleArray) {
            System.out.print(num + " ");
        }

        System.out.println("\nSum of Doubles: " + cm.computeSum(doubleArray));
    }
}
```