CSE1007 Java Programming. Fall Semester. Class Activity. 15-October-2021

Sharadindu Adhikari
19BCE2105

Questions:

Q1. How do you calculate the total execution time of the java program?

1. currentTimeMillis()
2. nanoTime()
3. now()

Q2. How do you generate the random numbers in java?

1. random() Method
2. Random Class
3. ThreadLocalRandom Class

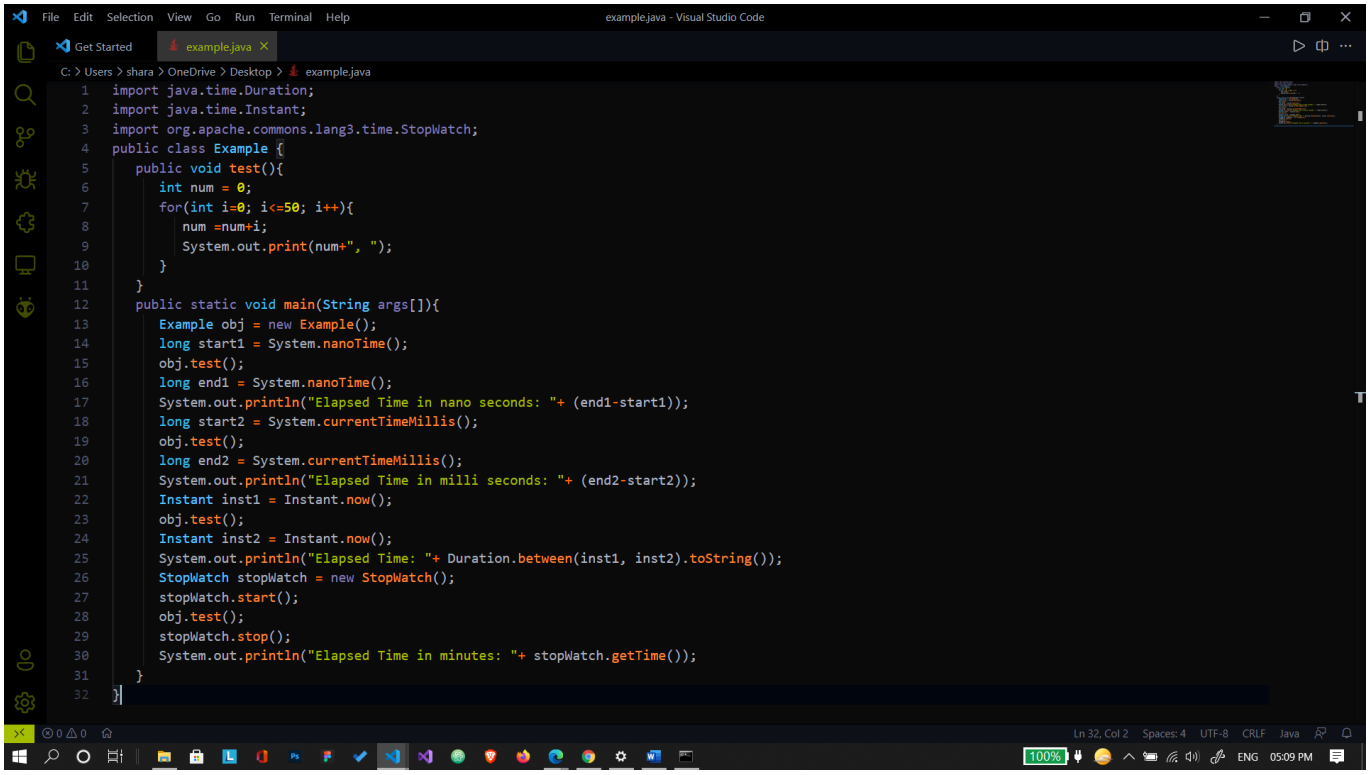
Solutions:

Q1. Calculating total execution time of the Java program using the given methods.

In general, the elapsed time is the time from the starting point to ending point of an event. Following are the given ways to find elapsed time in Java:

- The currentTimeMillis() method returns the current time in milliseconds. To find the elapsed time for a method you can get the difference between time values before and after the execution of the desired method.
- The nanoTime() method returns the current time in nano seconds. To find the elapsed time for a method you can get the difference between time values before and after the execution of the desired method.
- The now() method of the Instant class returns the current time and the Duration.between() methods returns the difference between the given two time values to get the elapsed time retrieve the time values before and after the execution of the desired method and retrieve the duration using the Duration.between() method.

Following example demonstrates how to find the execution time of a method using the given methods:



Output:

```
0, 1, 3, 6, 10, 15, 21, 28, 36, 45, 55, 66, 78, 91, 105, 120, 136, 153,
171, 190, 210, 231, 253, 276, 300, 325, 351, 378, 406, 435, 465, 496,
528, 561, 595, 630, 666, 703, 741, 780, 820, 861, 903, 946, 990, 1035,
1081, 1128, 1176, 1225, 1275, Elapsed Time in nano seconds: 1882300
```

```
0, 1, 3, 6, 10, 15, 21, 28, 36, 45, 55, 66, 78, 91, 105, 120, 136, 153,
171, 190, 210, 231, 253, 276, 300, 325, 351, 378, 406, 435, 465, 496,
528, 561, 595, 630, 666, 703, 741, 780, 820, 861, 903, 946, 990, 1035,
1081, 1128, 1176, 1225, 1275, Elapsed Time in milli seconds: 1
```

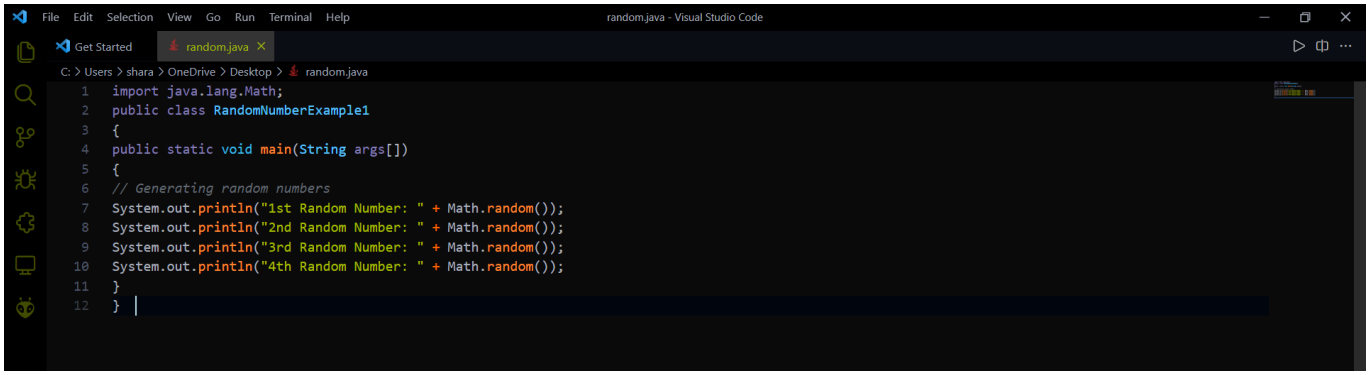
```
0, 1, 3, 6, 10, 15, 21, 28, 36, 45, 55, 66, 78, 91, 105, 120, 136, 153,
171, 190, 210, 231, 253, 276, 300, 325, 351, 378, 406, 435, 465, 496,
528, 561, 595, 630, 666, 703, 741, 780, 820, 861, 903, 946, 990, 1035,
1081, 1128, 1176, 1225, 1275, Elapsed Time: PT0.001S
```

```
0, 1, 3, 6, 10, 15, 21, 28, 36, 45, 55, 66, 78, 91, 105, 120, 136, 153,
171, 190, 210, 231, 253, 276, 300, 325, 351, 378, 406, 435, 465, 496,
528, 561, 595, 630, 666, 703, 741, 780, 820, 861, 903, 946, 990, 1035,
1081, 1128, 1176, 1225, 1275, Elapsed Time in minutes: 1
```

Q2. In Java, there are three main ways to generate random numbers using the method and classes.

- Using the random() Method
- Using the Random Class
- Using the ThreadLocalRandom Class

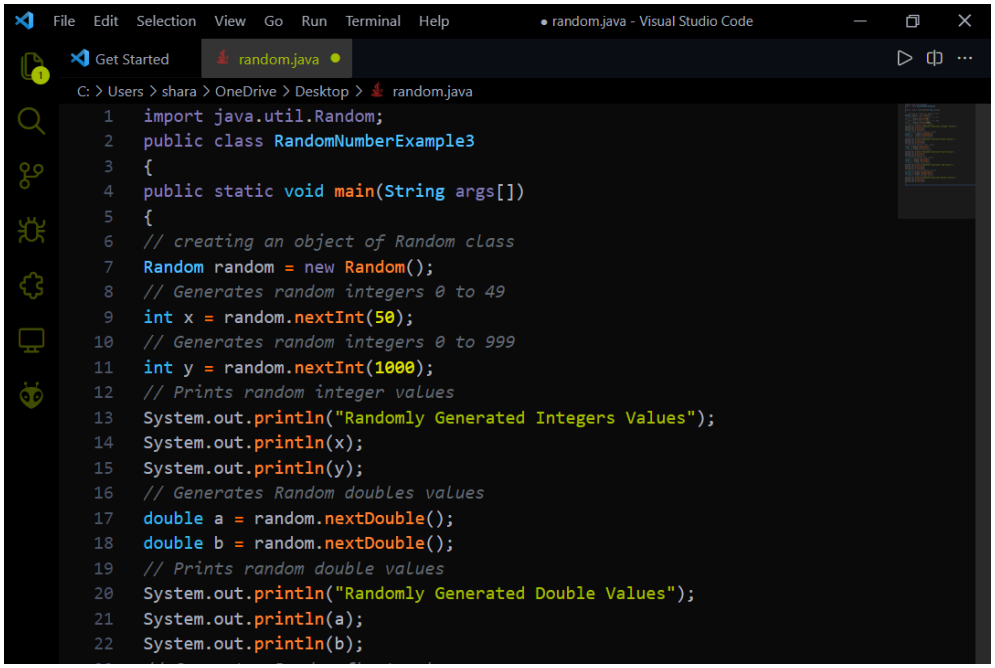
1. Using the random() method



Output:

```
1st Random Number: 0.17434160924512265
2nd Random Number: 0.4297410090709448
3rd Random Number: 0.4828656381344487
4th Random Number: 0.13267917059488898
```

2. Using the Random class



```
26  // Prints random float values
27  System.out.println("Randomly Generated Float Values");
28  System.out.println(f);
29  System.out.println(i);
30  // Generates Random Long values
31  long p = random.nextLong();
32  long q = random.nextLong();
33  // Prints random long values
34  System.out.println("Randomly Generated Long Values");
35  System.out.println(p);
36  System.out.println(q);
37  // Generates Random boolean values
38  boolean m=random.nextBoolean();
39  boolean n=random.nextBoolean();
40  // Prints random boolean values
41  System.out.println("Randomly Generated Boolean Values");
42  System.out.println(m);
43  System.out.println(n);
44  }
45  }
```

Output:

```
Randomly Generated Integers Values
23
767
Randomly Generated Double Values
0.37823814494212016
0.998058172671956
Randomly Generated Float Values
0.87804186
0.93880254
Randomly Generated Long Values
-4974823544291679198
3650240138416076693
Randomly Generated Boolean Values
false
true
```

3. Using the ThreadLocalRandom Class

Output 1:

```
Randomly Generated Integer Values:
348534891
-1887936727
Randomly Generated Double Values:
0.15644440033119833
0.5242730752133399
Randomly Generated Boolean Values:
true
true
```

Output 2:

```
Randomly Generated Integer Values:
402755574
295398333
Randomly Generated Double Values:
0.4856461791062565
0.5148677091077654
Randomly Generated Boolean Values:
false
true
```
