

## Lab5

### Programming Fundamentals (CS-130)

Total=100

Name:

Open Eclipse IDE and create a new class for each of the following questions: Choose class name that most appropriately defining the problem. Take a print screen of the code with console output.

1. Answer the following multiple choice questions

I. Which of the following classes include the `getCurrencyInstance()` method?

- A. String
- B. NumberFormat
- C. DecimalFormat
- D. Math
- E. None of the above

II. Consider the following snippet of code:

```
Random generator = new Random();  
  
int randNum = generator.nextInt(20) + 1;
```

Which of the following will be true after these lines are executed?

- A. randNum will hold a number between 1 and 20 inclusive.
- B. randNum will hold a number between 0 and 20 inclusive.
- C. randNum will hold a number between 1 and 21 inclusive.
- D. these lines will not be executed because a compiler error will result.
- E. none of the above

III. Which of the following expressions correctly computes the value of the mathematical expression  $5 + 2^6$ ?

- A. `Result = 5+Math.pow(2,6);`
- B. `Result = 5+2*exponent (6);`
- C. `Result = 5+2^6;`
- D. `Result = 5 + 2*Math.exponent(6);`

- IV. Suppose we have a String object referenced by a variable called listing.  
Create a new String object that consists of the first 5 characters in listing.

**listing = "3521 Parsons Avenue."**

- A. String prefix = listing.substring(1,5);
- B. String prefix = listing.front(5);
- C. String prefix = listing.substring(0,5);
- D. String prefix = listing.front(6);

- V. What is the value of num?

**double num = Math.sqrt(49);**

- A. 7
- B. 7.0

What is the value of num?

- VI. **double num = Math.floor(123.75);**

- A. 123.0
- B. 124.0

- VII. What is the value of num?

**double num = Math.ceil(45.17);**

- A. 45.0
- B. 46.0

- VIII. What is the value of num?

**double num = Math.abs(-1.28);**

- A. 1.28
- B. -1.28
- C. 1.3

D. 1.2

IX. What is the value of num?

```
double num = Math.max(100, 200);
```

- A. 100.0
- B. 200.0
- C. 300.0
- D. 150.0

X. What is the value of num?

```
double num = Math.min(100, 200);
```

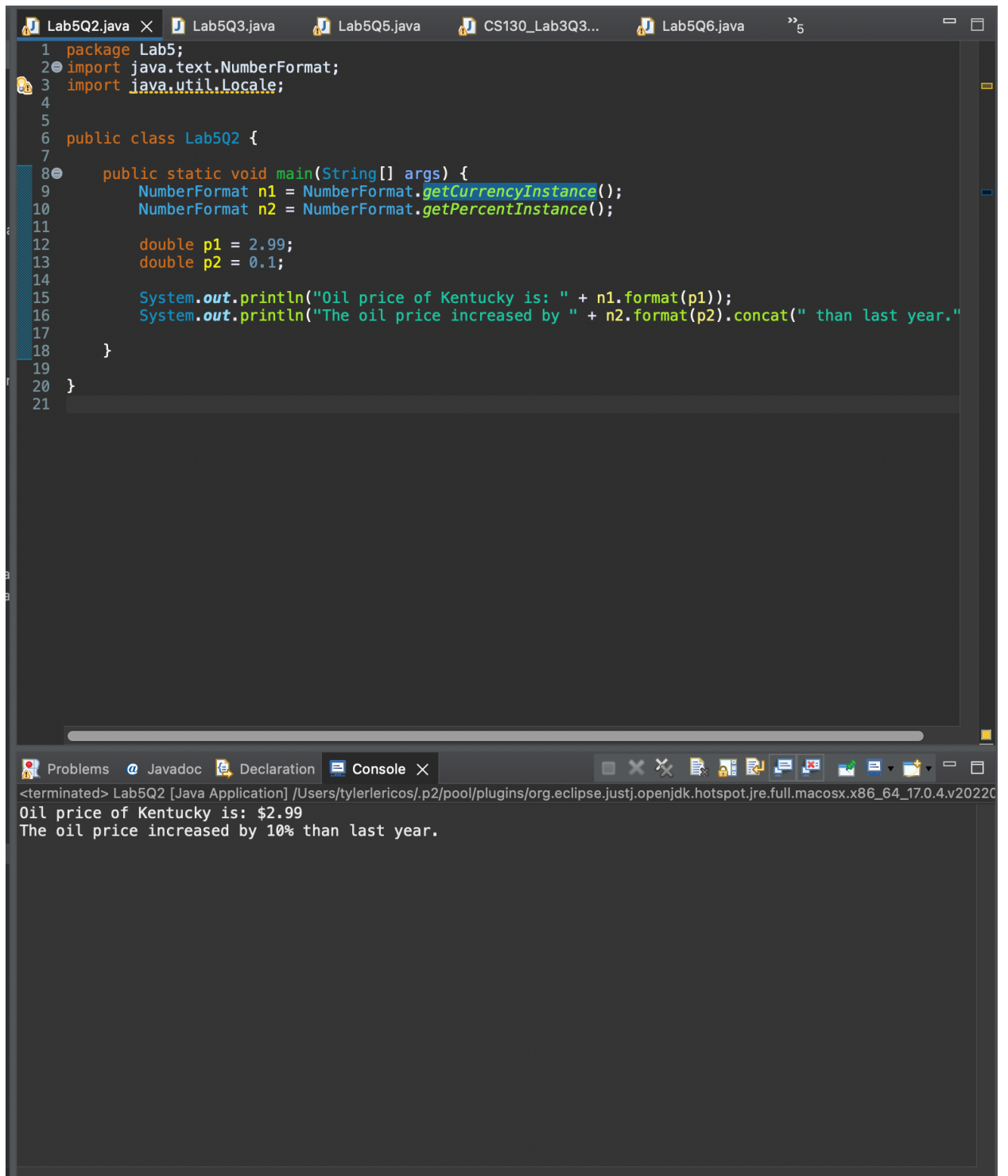
- A. 100.0
- B. 200.0
- C. 300.0
- D. 150.0

XI. `int a = random.nextInt(7) + 4;`

- A. Random number between 4 to 7, including 4 and 7
- B. Random number between 4 to 7, excluding 4 and 7
- C. Random number between 4 to 10, excluding 4 and 10
- D. Random number between 4 to 10, including 4 and 10

2. Print the following lines using `NumberFormat : getCurrencyInstance()`, `getPercentInstance()` method at eclipse.

- A. Oil price of Kentucky is: 2.99\$
- B. The oil price increased by 10% than last year.



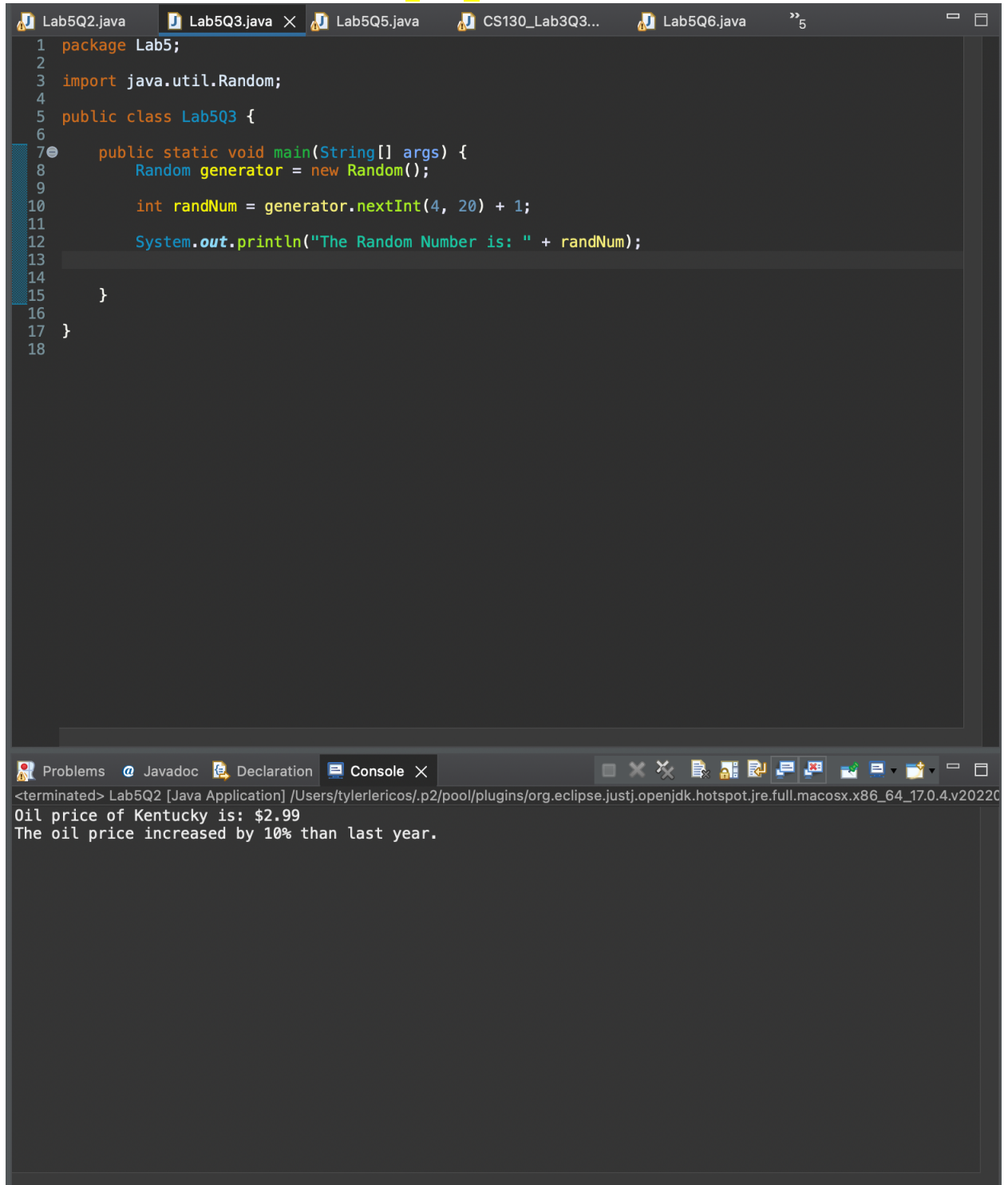
```
1 package Lab5;
2 import java.text.NumberFormat;
3 import java.util.Locale;
4
5
6 public class Lab5Q2 {
7
8     public static void main(String[] args) {
9         NumberFormat n1 = NumberFormat.getCurrencyInstance();
10        NumberFormat n2 = NumberFormat.getPercentInstance();
11
12        double p1 = 2.99;
13        double p2 = 0.1;
14
15        System.out.println("Oil price of Kentucky is: " + n1.format(p1));
16        System.out.println("The oil price increased by " + n2.format(p2).concat(" than last year.")
17
18    }
19
20 }
21
```

<terminated> Lab5Q2 [Java Application] /Users/tylerlericos/.p2/pool/plugins/org.eclipse.justj.openjdk.hotspot.jre.full.macosx.x86\_64\_17.0.4.v20220

Oil price of Kentucky is: \$2.99  
The oil price increased by 10% than last year.

3. Assume that we have a Random object referenced by a variable called generator. Generate a random number in the range 5-20 and store it in the int variable randNum.

```
randNum = generator.nextInt( a ) + b ;
```



The screenshot shows the Eclipse IDE with several tabs open: Lab5Q2.java, Lab5Q3.java (active), Lab5Q5.java, CS130\_Lab3Q3..., and Lab5Q6.java. The active tab, Lab5Q3.java, contains the following Java code:

```
1 package Lab5;
2
3 import java.util.Random;
4
5 public class Lab5Q3 {
6
7     public static void main(String[] args) {
8         Random generator = new Random();
9
10        int randNum = generator.nextInt(4, 20) + 1;
11
12        System.out.println("The Random Number is: " + randNum);
13
14    }
15 }
16
17
18
```

The console output at the bottom shows the following text:

```
<terminated> Lab5Q2 [Java Application] /Users/tylerlericos/.p2/pool/plugins/org.eclipse.justj.openjdk.hotspot.jre.full.macosx.x86_64_17.0.4.v20220
Oil price of Kentucky is: $2.99
The oil price increased by 10% than last year.
```

4. Create an Enumerated type of object called Day and enter all the seven days of the week. Print all the days and its ordinal.

```
Lab5Q3.java Lab5Q4.java X Lab5Q5.java CS130_Lab3Q3... Lab5Q6.java 5
1 package Lab5;
2
3 enum Days{Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday};
4
5
6
7 public class Lab5Q4 {
8
9     public static void main(String[] args) {
10         Days d1 = Days.Monday;
11         Days d2 = Days.Tuesday;
12         Days d3 = Days.Wednesday;
13         Days d4 = Days.Thursday;
14         Days d5 = Days.Friday;
15         Days d6 = Days.Saturday;
16         Days d7 = Days.Sunday;
17
18         System.out.println("Day1: " + d1.ordinal());
19         System.out.println("Day2: " + d2.ordinal());
20         System.out.println("Day3: " + d3.ordinal());
21         System.out.println("Day4: " + d4.ordinal());
22         System.out.println("Day5: " + d5.ordinal());
23         System.out.println("Day6: " + d6.ordinal());
24         System.out.println("Day7: " + d7.ordinal());
25
26     }
27 }
28
29 }
30
```

Problems Javadoc Declaration Console X

<terminated> Lab5Q4 [Java Application] /Users/tylerlericos/.p2/pool/plugins/org.eclipse.justj.openjdk.hotspot.jre.full.macosx.x86\_64\_17.0.4.v2022

Day1: 0  
Day2: 1  
Day3: 2  
Day4: 3  
Day5: 4  
Day6: 5  
Day7: 6

5. Write an application that reads the (x,y) coordinates for two points. Compute the distance between the two points using the following formula:

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

A sample of what your output should look like appears below:

Enter the first x coordinate:12.0

Enter the first y coordinate:24.0

Enter the second x coordinate: 67.0

Enter the second y coordinate: 89.0

Write down formatted output about two decimal places using

**DecimalFormat.**

The distance between points [12.0,24.0] and [67.0, 89.0] is 85.14.



```
Lab5Q3.java Lab5Q4.java Lab5Q5.java X CS130_Lab3Q3... Lab5Q6.java 5
1 package Lab5;
2
3 import java.util.Scanner;
4 import java.text.DecimalFormat;
5
6
7 public class Lab5Q5 {
8
9     public static void main(String[] args) {
10         Scanner scan = new Scanner(System.in);
11
12         double discriminant, d;
13
14         System.out.println("X1: ");
15         double x1 = scan.nextDouble();
16         System.out.println("X2: ");
17         double x2 = scan.nextDouble();
18         System.out.println("Y1: ");
19         double y1 = scan.nextDouble();
20         System.out.println("Y2: ");
21         double y2 = scan.nextDouble();
22
23         discriminant = (Math.pow((x2-x1),2))+(Math.pow((y2-y1),2));
24
25         d = (Math.sqrt(discriminant));
26
27         DecimalFormat format1 = new DecimalFormat("0.##");
28
29         System.out.println("The Distance between points 12.0, 24.0 and 67.0, 89.0 is " + format1.f
30
31
32
33
34
35     }
36 }
37
38 }
39
```

Problems Javadoc Declaration Console X

<terminated> Lab5Q5 [Java Application] /Users/tylerlericos/.p2/pool/plugins/org.eclipse.justj.openjdk.hotspot.jre.full.macosx.x86\_64\_17.0.4.v20220

X1:  
67  
X2:  
12  
Y1:  
89  
Y2:  
24  
The Distance between points 12.0, 24.0 and 67.0, 89.0 is 85.15

6. Write an application that reads the lengths of the sides of a triangle from the user. Compute the area of the triangle using Heron's formula in which  $s$  represents half of the perimeter of the triangle, and  $a$ ,  $b$ ,  $c$ , represent the lengths of the three sides.

$$area = \sqrt{s(s - a)(s - b)(s - c)}$$

Below is a sample of what your output should look like:

Enter the length of side A (integer):

Enter the length of side B (integer):

Enter the length of side C (integer):

The area is xyz.yz

The output will be formatted two decimal places using **DecimalFormat**.

The result is : 16.70

```
Lab5Q3.java Lab5Q4.java Lab5Q5.java CS130_Lab3Q3... Lab5Q6.java X »5
1 package Lab5;
2
3 import java.util.Scanner;
4 import java.text.DecimalFormat;
5
6 public class Lab5Q6 {
7
8     public static void main(String[] args) {
9         Scanner scan = new Scanner(System.in);
10
11         DecimalFormat format1 = new DecimalFormat("0.##");
12
13         double area, discriminant, s;
14
15         System.out.println("A: ");
16         double a = scan.nextDouble();
17         System.out.println("B: ");
18         double b = scan.nextDouble();
19         System.out.println("C: ");
20         double c = scan.nextDouble();
21
22         s = (a+b+c)/2;
23
24         discriminant = s*(s-a)*(s-b)*(s-c);
25
26         area = Math.sqrt(discriminant);
27
28         System.out.println("The result is " + format1.format(area));
29
30     }
31 }
32
33 }
34
```

Problems Javadoc Declaration Console X

<terminated> Lab5Q6 [Java Application] /Users/tylerlericos/.p2/pool/plugins/org.eclipse.justj.openjdk.hotspot.jre.full.macosx.x86\_64\_17.0.4.v20220

A:  
12  
B:  
12  
C:  
12  
The result is 62.35