

# COS 126 Written Exam 1 Spring 2020

There are seven questions on this exam, each worth 2.5 points. There is one question per lecture, numbered in order of the lectures, *not in order of difficulty*. If a question seems difficult to you, skip it and come back to it. You will have 50 minutes to complete the exam.

**This exam is preprocessed by computer.** You answer questions by filling in circles *completely* with a dark pencil. If you change your mind, you must erase *completely* and fill in another circle!

Do this ● not this ✓ or this ✗ or this ✗.

**Resources.** You may reference your optional one-sided 8.5-by-11 handwritten "cheat sheet" during this exam. You may not use the textbook, your notes, or any electronic devices. You may not communicate with anyone except the course staff during this exam.

**Discussing this exam.** Due to travel for extracurriculars and sports, some of your peers will take this exam later. Do not discuss its contents with anyone who has not taken it.

**This page.** Do not remove this exam from the exam room. Fill in this page now, but do not start the exam until you are told.

Name

NetID

Precept

Exam Room

*"I pledge my honor that I have not violated the Honor Code during this examination."*

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[copy the pledge here]

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[signature]



## Q2. Basic definitions (2.5 points).

In the box to the left of each description, write the letter corresponding to the Java language entity that best matches. A letter may be used once, more than once, or not at all, but there is only one correct answer for each box.

- |                          |  |          |                          |
|--------------------------|--|----------|--------------------------|
| <input type="checkbox"/> | Java data type that has only two values                  |          |                          |
| <input type="checkbox"/> | A double operator  | <b>A</b> | array                    |
| <input type="checkbox"/> | A String operator  | <b>B</b> | data type                |
| <input type="checkbox"/> | A double literal   | <b>C</b> | 3.14                     |
| <input type="checkbox"/> | Source-code representation of $\pi$                      | <b>D</b> | boolean                  |
| <input type="checkbox"/> | A set of values and operations on those values           | <b>E</b> | Math.sqrt()              |
| <input type="checkbox"/> | A Java library function                                  | <b>F</b> | +                        |
| <input type="checkbox"/> | Data structure for a sequence of values of the same type | <b>G</b> | binary                   |
| <input type="checkbox"/> | Java data type for integers                              | <b>H</b> | StdOut                   |
| <input type="checkbox"/> | A boolean operator                                       | <b>I</b> | <i>none of the above</i> |

### Q3. Loops and conditionals (2.5 points).

Suppose that this code is in the file Q3.java

```
public class Q3
{
    public static void main(String[] args)
    {
        int N = Integer.parseInt(args[0]);
        String r = "+";
        for (int i = 1; i <= N; i++)
            if ((i % 2) == 0)
                r = r + i + r;
            else r = i + r + i;
        System.out.println(r);
    }
}
```

and that you compile it using the command `javac-introcs Q3.java`. Study the code to verify that the command `java-introcs Q3 1` prints the string "1+1" and `java-introcs Q3 2` prints the string "1+121+1".

Then fill in the circle on each row corresponding to the specified character. You must fill in exactly one circle in each row.

	1	2	3	4	5
first character printed by <code>java-introcs Q3 3</code>	<input type="radio"/>				
first character printed by <code>java-introcs Q3 4</code>	<input type="radio"/>				
tenth character printed by <code>java-introcs Q3 5</code>	<input type="radio"/>				
second character printed by <code>java-introcs Q3 5</code>	<input type="radio"/>				
next-to-last character printed by <code>java-introcs Q3 6</code>	<input type="radio"/>				

#### Q4. Arrays (2.5 points).

For each code snippet at left, fill in the *one* circle at right that describes whether it is legal or whether it will lead to an error.

	<i>legal code</i>	<i>compile-time error</i>	<i>run-time error</i>
<code>int[] a;</code>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<code>int[] b = 0;</code>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<code>int[] c = int[10];</code>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<code>int[] d = new int[10];</code>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<code>int[][] e = new int[10];</code>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<code>int[10] f = new int[10];</code>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<code>int[] g = new int g[10];</code>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<code>int[] h = {1, 2, 3}; int t = h;</code>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<code>int[] i = {1, 2, 3}; int[] u = i;</code>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<code>int[] j = {1, 2, 3}; int v = j[3];</code>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Q5. I/O (2.5 points).

Carefully study the following Java program.

```
public class Q5
{
    public static void main(String[] args)
    {
        int N = args.length;
        String[] a = new String[N * 2];
        for (int i = 0; i < N; i++)
        {
            a[i] = args[i];
            a[i + N] = args[N - i - 1];
        }
        for (int i = 0; i < a.length; i++)
            StdOut.print(a[i] + " ");
        StdOut.println();
    }
}
```

In the box to the left of each command, write the letter corresponding to the output it produces. A letter may be used once, more than once, or not at all.

java-introcs Q5 now is

java-introcs Q5 is is

java-introcs Q5 is now

java-introcs Q5 is now | java-introcs Q5 now is

java-introcs Q5 is is | java-introcs Q5 now now

**A** is is is is

**B** is is now now

**C** is now is now

**D** is now now is

**E** now is is now

**F** now is now is

**G** now now is is

**H** now now now now



