

CSSE 220 – Object-Oriented Software Development
Rose-Hulman Institute of Technology

Worksheet 10

Name (Print): _____ Section: _____

1. Review: null vs empty

Key idea: _____ means “no object exists.” **Empty** means the object exists but has _____.

Type	Check for null	Check for empty	Create an empty instance
String			
Array			
ArrayList			
HashMap			

2. Review - Size of Objects. Provide a correct method to identify the size of each object:

```

1 String s = "Hello"; -----
2
3 int[] nums = {1,2,3,4,5}; -----
4
5 ArrayList<String> list = new ArrayList<>(); -----
6
7 HashMap<String, Integer> map = new HashMap<>(); -----

```

3. Trace it (what happens and why?). For each line, write: **OK**, **compile error**, or **runtime error**, and name the error if applicable.

	Result	Why / Error name
int[][] ar1 = null;	_____	_____
int[][] ar2 = new int[][][];	_____	_____
int[][] ar3 = new int[0][0];	_____	_____
ar3[0][0] = 3;	_____	_____
System.out.println(ar1.length);	_____	_____
System.out.println(ar3.length);	_____	_____

4. Console vs GUI

1. In a console app, code runs sequentially and waits for input using _____.
2. In a graphical app, the program waits for _____ and reacts using _____.

5. Reading Input with Scanner. Complete the missing lines so the program:

- reads two integers from the keyboard
- prints their sum in the format Result: sum

```
import java.util.Scanner;
public class SumExample {
    public static void main(String[] args) {
        // Create a Scanner that reads from the keyboard
        Scanner scanner = _____(System.in);
        System.out.print("Enter first number: ");
        int num1 = _____;
        System.out.print("Enter second number: ");
        int num2 = _____;
        // Print the sum
        System.out.println("Result: " + _____);
    }
}
```

6. Swing vs AWT (Big Picture). Java graphical programs typically use **both** Swing and AWT. Select the correct toolkit for each responsibility:

Responsibility	Swing	AWT
Windows, buttons, labels	<input type="checkbox"/>	<input type="checkbox"/>
Drawing shapes and colors	<input type="checkbox"/>	<input type="checkbox"/>
Handling mouse and keyboard events	<input type="checkbox"/>	<input type="checkbox"/>
Layout managers	<input type="checkbox"/>	<input type="checkbox"/>
Custom painting with paintComponent	<input type="checkbox"/>	<input type="checkbox"/>

7. Common Containers

- _____ the top-level container (the window itself).
- _____ a container used to group components inside a window and used for custom drawing.

8. Drawing Rule

You must override `paintComponent(Graphics g)` in a JPanel to draw anything in a Swing application
True / False

9. Before You Leave

Write one question you still have about today's topic.