

This lab has **eight (8)** checkpoints.

Learning Outcomes

Upon completing this lab, students should be able to

- **trace** Java code that uses an `ArrayList`.
- **clone**, **init**, **config**, and **push** a simple git repository using the Departmental Gitea server at <https://cs-devel.potsdam.edu>
- **use** a predefined **class** as the content in an `ArrayList`, reading data from a file.
- **implement**, **compile**, and **run** a Java application program that uses two different Java **packages**.

Introduction

1. Dr Ladd spent all his time configuring lab computers; he appears to have forgotten how to write Java. When he wrote the following:

```
1 import java.util.ArrayList;
2 import java.util.List;
3
4 public class Dumb {
5     public static void main(String[] args) {
6         List<int> numbers = new ArrayList<int>();
7
8         int sum = 0;
9         for (int i = 0; i < 10; i++) {
10             sum += (i + 1);
11             numbers.add(sum);
12         }
13
14         for (int i = 0; i < numbers.size(); i++) {
15             System.out.println(numbers.get(i));
16         }
17     }
18 }
```

He gets the following error messages

```
Dumb.java:5: error: unexpected type
    List<int> numbers = new ArrayList<int>();
    ^
    required: reference
    found:    int
Dumb.java:5: error: unexpected type
    List<int> numbers = new ArrayList<int>();
                                ^
    required: reference
    found:    int
2 errors
```

Using the official Java documentation, write down how you would fix these errors. (Don't rely on any old StackExchange post.)

Then write down (in your own words) **why** this error occurred.

✓ Show your answers to the lab instructor and expect to have to explain them.

2. What output is generated by the following Java code?

```
import java.util.Scanner;

public class Scan {
    public static void main(String[] args) {
        String longTime = "a long time ago, in a galaxy far, far away...";
        Scanner ltScanner = new Scanner(longTime);
        while (ltScanner.hasNext()) {
            System.out.println "[" + ltScanner.next() + ""];
        }
    }
}
```

✓ Show your sample output to the lab instructor and expect to explain why that is what it is.

3. For the sake of this question, assume the Java standard library source code is stored in (and below) the /jssl directory.

Using what you know about Java class files and *packages*, draw a picture of what the following import statements tell you about the directory structure inside /jssl:

```
import java.io.File;
import java.io.FileNotFoundException;
import java.util.Scanner;
```

✓ Show your drawing of the directory structure to the lab instructor and expect to explain how you know it is correct.