UNIVERSITY OF MISSOURI-COLUMBIA
COLLEGE OF ENGINEERING
DEPARTMENT OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCE

3330 – OBJECT-ORIENTED PROGRAMMING

Laboratory 3: Java Fundamentals – Part 2

Due Date: Friday September 19th, 2025, at 5:00 pm
(No late submissions will be accepted for this Lab)

1 Goal

In this lab you will learn how to read console input with the Scanner class.

2 Resources

- Lecture notes "Unit 1"

3 Directed Lab Work

3.1 Input and output in Java code

There are several ways to read values from the standard input. The first way is to use **java.util.Scanner**.

Let's read two integer numbers from the standard input, add them together and write the result in the standard output:

```
import java.util.Scanner;
public class Task {
   public static void main(String[] args) {
      // define a Scanner object called scanner
      Scanner scanner = new Scanner(System.in);

      // it reads an integer value from the standard input
      int a = scanner.nextInt();

      // it reads another integer value from the standard input
      int b = scanner.nextInt();

      // it writes the result of a + b in the standard output
      System.out.println(a + b);
   }
}
```

3.1.1 Task 1

- Use IntelliJ IDE to write a Java program that includes the main method. Your project name must be Task1, with your own choice class name.

- The program should be able to read two **integer** numbers from the standard input using Scanner class method **nextInt**(), and then outputs the addition of its squares, using System.out object. For instance, if the two numbers are a and b then the addition of its squares is ($a \times a + b \times b$).
- Don't forget to add comments.

3.1.2 Task 2

- Use IntelliJ IDE to write a Java program that includes the main method. Your project name must be Task2, with your own choice class name.
- The program should be able to read an integer value n from the standard input using Scanner class and outputs the result of the following arithmetic expression:

$$((n + 1) * n + 2) * n + 3$$

- Run your program and make sure it prints the value 45 when `n = 3`.
- Don't forget to add comments.

3.1.3 Task 3

- Use IntelliJ IDE to write a Java program that includes the main method. Your project name must be Task3, with your own choice class name.
- The program should be able to read a two-digit integer number d from the standard input using Scanner class method nextInt() and outputs the second digit followed by a string literal "<->" followed by the first digit.
- Hint: Use the % operator to extract digits, and use the / operator to remove the extracted digit. For instance, if `d = 46` then 46 % 10 = 6 and 46 / 10 = 4.
- Run your program and make sure it prints `6<->4` when `d = 46`.
- Don't forget to add comments.

3.1.4 Task 4

- Use IntelliJ IDE to write a Java program that includes the main method. Your project name must be Task4, with your own choice class name.
- The program should be able to read any decimal number of type double through the standard input using the Scanner class method nextDouble() and displays the whole and the fractional parts from this number.
- Run your program and make sure it prints `82.0` and `0.5` in two different lines if the given double number is `82.5`.
- Don't forget to add comments.

3.1.5 Task 5

- In this task you will be writing the quiz part of this lab. Use the Tests & Quizzes tab on Canvas to complete and submit answer for this quiz.

- The quiz includes one programming question to evaluate your understanding of this lab material. You will be given **30 minutes** to complete and submit your answer, please follow the following important instructions.
  - You are to complete this quiz independently and alone. Collaborating, discussing, or sharing of information during the quiz is not permitted.
  - Use the IntelliJ Idea IDE to create a new Java project file and named it yourUMId_Lab3_Quiz. **yourUMId is the first part of your UM (University of Missouri) email address before the @ sign**.
  - The quiz link will be inactive on **September 19 at 5:00 PM**. Note that, it is allowed to submit only once, so please review your code carefully before submitting your answer.
  - To start, click Final Assessment link. Once you click "Begin Assessment," you will have 30 minutes to complete this quiz.
  - Read the question and start to write your codes using the opened project file in the IntelliJ IDE.
  - After finishing your program, export your project as yourUMId_Lab3_Quiz.zip file.
  - To submit your answers, click the Browse button, navigate the file explorer to your exported zip file, click Upload button, and then click Submit for Grading button.

4 Hand In

- Create a new folder and name it yourUMId_Lab3, then copy the folders of projects Task1, Task2, Task3 and Task4 in your new folder yourUMId_Lab3. yourUMId is the first part of your UM (University of Missouri) email address before the @ sign Zip yourUMId_Lab3 folder into yourUMId_Lab3.zip.
- Make sure you followed the instructions for the naming conventions, the types, and the submitted file structure.
- Submit your *yourUMId*_ Lab3.zip file into Canvas on **September 19, before 5 PM**.
- **No submissions will be accepted after September 19, 5:00 PM**