CST8116 Pre-Lab Exercise 02

**Revised 13 Sep 2033, DHaley**

Learning Resources

* Review the PowerPoint Slides, and Microsoft Word documents in lecture notes Week 2.
  + Complete Hybrid 2 to learn how to perform debugging with Eclipse.
* Complete the required reading in Week 2.

Joyce Farrell. 2018. Programming Logic &amp; Design Comprehensive. 9th Ed. Cengage Learning.

- Read Chapter 2

Cay Horstmann. 2019. Big Java Early Objects. 7th Ed. Wiley.

- Read Chapter 2

Learning Objectives

1. Be able to debug a program with syntax and logic errors.
2. Utilize variables to store and manipulate user input.
3. Practice the basics of Java programming by creating a simple program that outputs text to the console.

**General Instruction:** You should complete the following tasks before your scheduled lab period.

Task 1 – Syntax and Logic Error

***For each of the given program segments, determine if there is an error in the code. If there is an error, specify whether it is a logic error or a syntax error, then state the correction of the code. Note: It is possible that a program segment may contain multiple errors.***

1. The following program should input the value of an integer into variable **num**:

import java.Scanner;

public class Output {

public static void main(String[] args) {

int num

Scanner input = Scanner(in);

num = input.int();

}

}

2. The following program should output the integer value entered by the user:

import java.util.Scanner;

public class Display {

public static void main(String[] args) {

int num1;

Scanner input = new Scanner(System.*in*);

System.*out*.println("Enter first integer: ");

Scanner.nextInt(num1);

System.*out*.println(num1);

}

}

Task 2 – Java Program

Write a program that reads the dimensions of a big rectangle from the user (length and width). It then reads the dimensions of a smaller rectangle from the user. If the smaller rectangle were to be placed inside the larger rectangle, how much empty space would remain inside the larger rectangle? Hint: Use **length x width** for computing the area of a rectangle.

The statements for the program above are written below, however, they are not in order and there may be other missing lines of code used to declare the variables. Include any missing lines of code and order the statements below so that the program will work correctly:

import java.util.Scanner;

public class RectangleProgram {

public static void main(String[] args) {

1. lengthSmall = input.nextInt();

2. int areaBig;

3. System.out.printf ("The area remaining is %d%s\n", areaLeft, “square units”);

4. System.out.print("Enter the length of the large box: ");

5. int widthBig;

6. widthBig = input.nextInt();

7. Scanner input = new Scanner(System.in);

8. areaLeft = areaBig-areaSmall;

9. System.out.print("Enter the width of the small box: ");

10. int areaSmall;

11. areaSmall = lengthSmall \* widthSmall;

12. int lengthBig;

13. System.out.print("Enter the length of the small box: ");

14. int lengthSmall;

15. System.out.print("Enter the width of the large box: ");

16. areaBig =lengthBig \* widthBig;

17. int widthSmall;

18. widthSmall = input.nextInt();

19. int areaLeft;

20. lengthBig = input.nextInt();

Task 3 – Testing

Test the program with different input values to ensure it calculates the required output correctly.

**Before running the program in Eclipse,** complete the following test plan to verify that your corrected java code from Task 2 is correct. In other words, start at the beginning of the code and manually trace through the code line by line documenting the output. If your output does not match the expected output, re-examine your sequence of steps.

|  |  |  |  |
| --- | --- | --- | --- |
| Input | Expected Output | Actual Output | Description |
| 10  6  8  4 |  |  |  |

# Task 4 – Debugging

Using the second your program from Task 1, set a break point at System.out.println(num1);

Run the program in the debug mode and investigate program execution on the breakpoint, variables data, and console output.

Place a screenshot in your MSWord document that includes the breakpoint line of code, Variables data and Console output.