

# Programming Fundamentals

## Lab #3

### Exercise 1: AgeGuess (Modified with a while loop)

```
import java.util.Scanner;
import java.util.Random;

public class Ex1_AgeGuess {
    public static void main(String[] args) {
        // Declare and initialize variables
        int age;
        int ageGuess;

        // Generate a random age between 0 and 100 (inclusive)
        Random rand = new Random();
        age = rand.nextInt(101);

        // Initialize scanner for user input
        Scanner scanner = new Scanner(System.in);

        // Loop until the user guesses the correct age
        while (true) {
            // Ask the user for a guess
            System.out.print("Guess the age: ");
            ageGuess = scanner.nextInt();

            // Check if the guess is correct
            if (ageGuess == age) {
                System.out.println("Congratulations! You guessed
the correct age: " + age);
                break; // Exit the loop if the guess is correct
            } else {
                System.out.println("Incorrect guess. Try again!");
            }
        }

        // Close the scanner
        scanner.close();
    }
}
```

```
C:\Users\n1909\OneDrive\Desktop\EduBot\Lab-3\Codes>javac Ex1_AgeGuess.java

C:\Users\n1909\OneDrive\Desktop\EduBot\Lab-3\Codes>java Ex1_AgeGuess.java
Guess the age: 1
Incorrect guess. Try again!
Guess the age: 23
Incorrect guess. Try again!
Guess the age: 34
Incorrect guess. Try again!
Guess the age: 345
Incorrect guess. Try again!
Guess the age: 45
Incorrect guess. Try again!
Guess the age: 56
Incorrect guess. Try again!
Guess the age: 67
Incorrect guess. Try again!
Guess the age: 78
Incorrect guess. Try again!
Guess the age:
```

## Exercise 2: EvenNumSum

```
import java.util.Scanner;

public class Ex2_EvenNumSum {
    public static void main(String[] args) {
        // Initialize scanner for user input
        Scanner scanner = new Scanner(System.in);

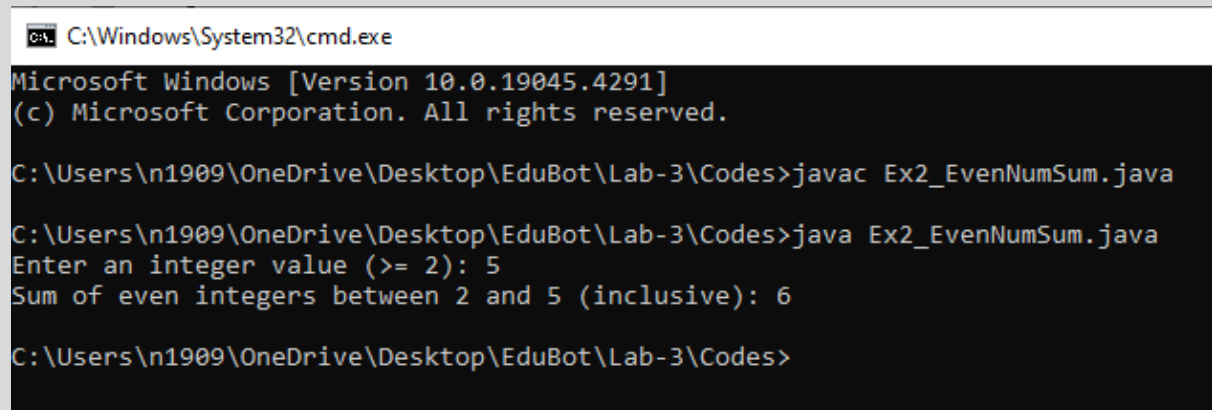
        // Prompt the user to enter an integer value
        System.out.print("Enter an integer value (>= 2): ");
        int input = scanner.nextInt();

        // Validate the input
        while (input < 2) {
            System.out.println("Error: Input value must be greater
than or equal to 2.");
            System.out.print("Please re-enter an integer value (>=
2): ");
            input = scanner.nextInt();
        }

        // Calculate and print the sum of all even integers
        between 2 and the input value
        int sum = 0;
        for (int i = 2; i <= input; i += 2) {
            sum += i;
        }
        System.out.println("Sum of even integers between 2 and " +
input + " (inclusive): " + sum);

        // Close the scanner
```

```
        scanner.close();
    }
}
```



The screenshot shows a Windows Command Prompt window with the title bar "C:\Windows\System32\cmd.exe". The window content displays the following text:

```
Microsoft Windows [Version 10.0.19045.4291]
(c) Microsoft Corporation. All rights reserved.

C:\Users\n1909\OneDrive\Desktop\EduBot\Lab-3\Codes>javac Ex2_EvenNumSum.java

C:\Users\n1909\OneDrive\Desktop\EduBot\Lab-3\Codes>java Ex2_EvenNumSum.java
Enter an integer value (>= 2): 5
Sum of even integers between 2 and 5 (inclusive): 6

C:\Users\n1909\OneDrive\Desktop\EduBot\Lab-3\Codes>
```

### Exercise 3: VowelCounter

```
import java.util.Scanner;

public class Ex3_VowelCounter {
    public static void main(String[] args) {
        // Initialize scanner for user input
        Scanner scanner = new Scanner(System.in);

        // Prompt the user to enter a string
        System.out.print("Enter a string: ");
        String input = scanner.nextLine();

        // Initialize counters for vowels and non-vowels
        int aCount = 0, eCount = 0, iCount = 0, oCount = 0, uCount
= 0, nonVowelCount = 0;

        // Convert the input string to lowercase for
case-insensitive comparison
        input = input.toLowerCase();

        // Iterate through each character in the string
        for (int i = 0; i < input.length(); i++) {
            char ch = input.charAt(i);
            // Increment the respective vowel counter
            switch (ch) {
                case 'a':
                    aCount++;
                    break;
                case 'e':
                    eCount++;
                    break;
                case 'i':
                    iCount++;
                    break;
                case 'o':
```

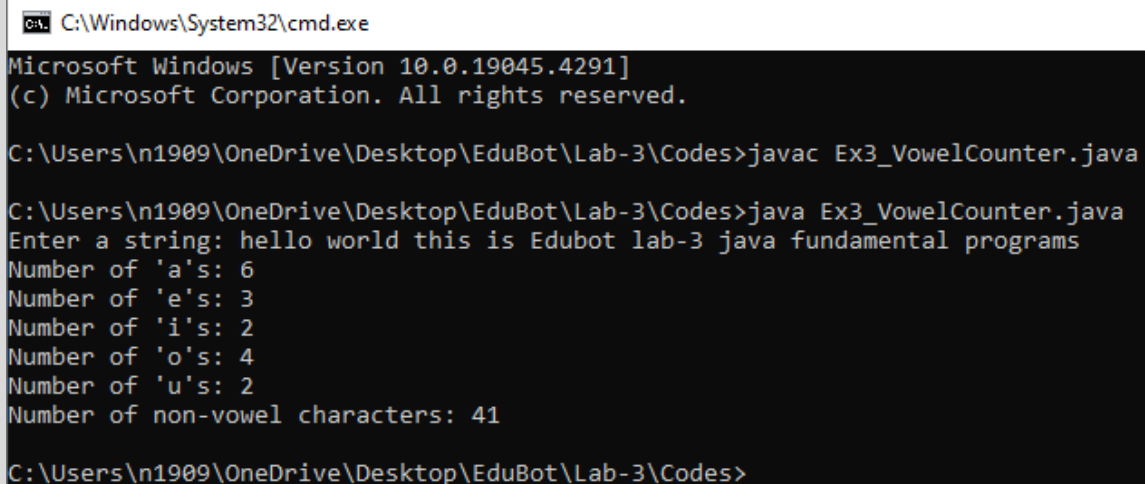
```

        oCount++;
        break;
    case 'u':
        uCount++;
        break;
    default:
        // Increment the non-vowel counter for any
other character
        nonVowelCount++;
        break;
    }
}

// Print the counts of each vowel and non-vowel
System.out.println("Number of 'a's: " + aCount);
System.out.println("Number of 'e's: " + eCount);
System.out.println("Number of 'i's: " + iCount);
System.out.println("Number of 'o's: " + oCount);
System.out.println("Number of 'u's: " + uCount);
System.out.println("Number of non-vowel characters: " +
nonVowelCount);

// Close the scanner
scanner.close();
}
}

```



C:\Windows\System32\cmd.exe

Microsoft Windows [Version 10.0.19045.4291]  
(c) Microsoft Corporation. All rights reserved.

C:\Users\n1909\OneDrive\Desktop\EduBot\Lab-3\Codes>javac Ex3\_VowelCounter.java

C:\Users\n1909\OneDrive\Desktop\EduBot\Lab-3\Codes>java Ex3\_VowelCounter.java

Enter a string: hello world this is Edubot lab-3 java fundamental programs

Number of 'a's: 6  
Number of 'e's: 3  
Number of 'i's: 2  
Number of 'o's: 4  
Number of 'u's: 2  
Number of non-vowel characters: 41

C:\Users\n1909\OneDrive\Desktop\EduBot\Lab-3\Codes>

## Exercise 4: Box

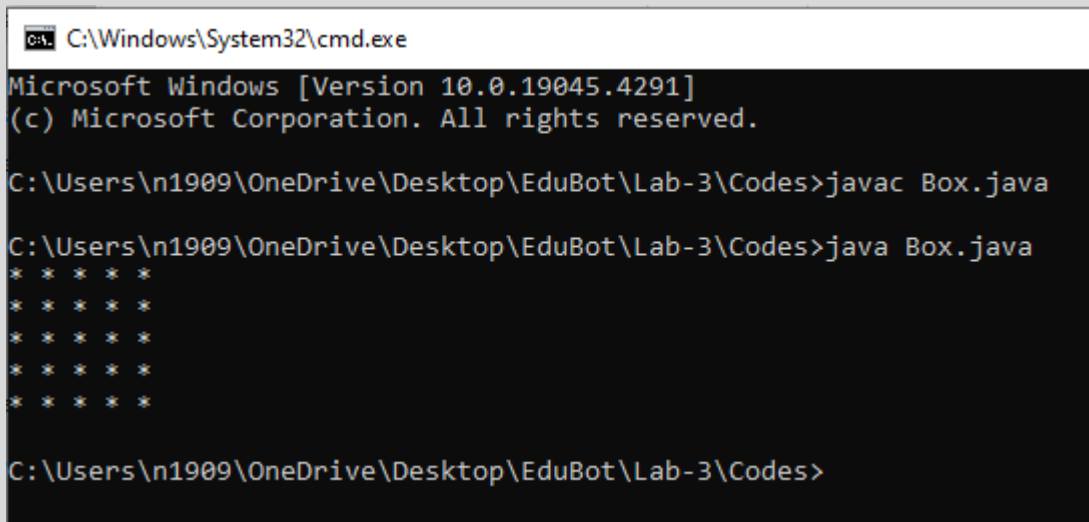
```
public class Ex4_Box {
    int size = 0;

    public static void main(String[] args) {
        // Create a Box object
        Box box = new Box();

        // Set the size of the box
        box.size = 5;

        // Invoke the printBox method
        box.printBox();
    }

    // Method to print a box of stars
    public void printBox() {
        for (int i = 0; i < size; i++) {
            for (int j = 0; j < size; j++) {
                System.out.print("* ");
            }
            System.out.println();
        }
    }
}
```



The screenshot shows a Windows command prompt window titled "C:\Windows\System32\cmd.exe". The window displays the following text:

```
Microsoft Windows [Version 10.0.19045.4291]
(c) Microsoft Corporation. All rights reserved.

C:\Users\n1909\OneDrive\Desktop\EduBot\Lab-3\Codes>javac Box.java

C:\Users\n1909\OneDrive\Desktop\EduBot\Lab-3\Codes>java Box.java
* * * * *
* * * * *
* * * * *
* * * * *
* * * * *

C:\Users\n1909\OneDrive\Desktop\EduBot\Lab-3\Codes>
```

The output shows a 5x5 grid of asterisks, indicating that the Java program executed successfully and printed the expected box shape.