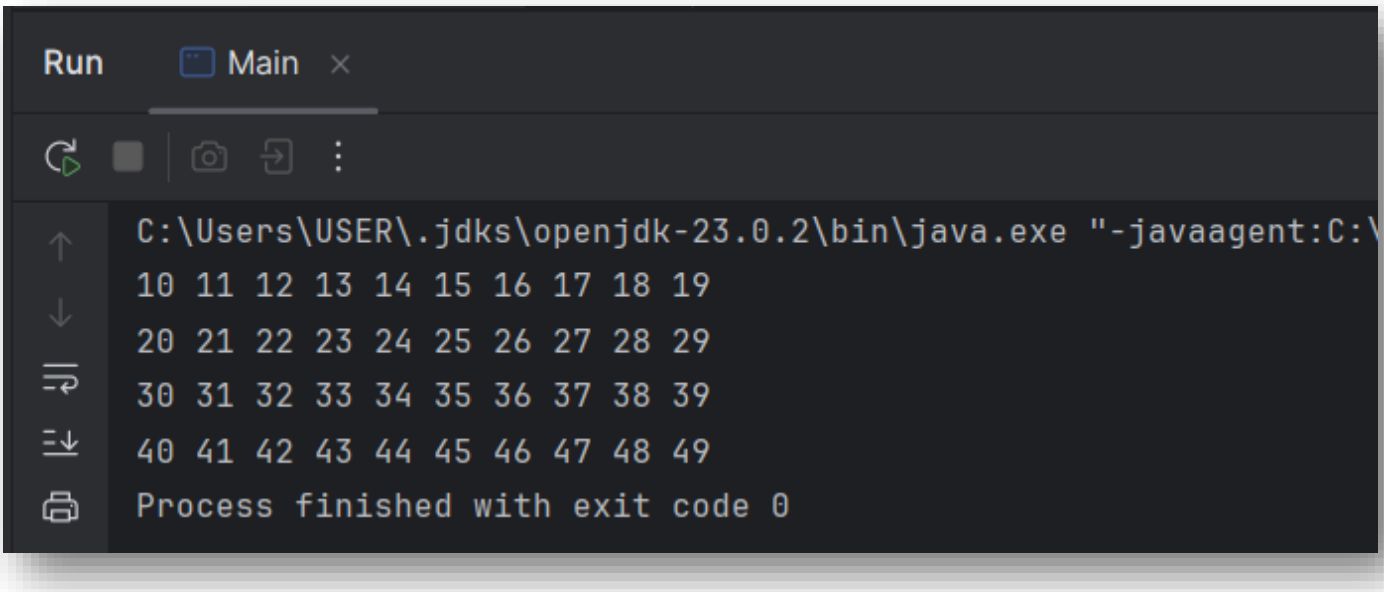
Q1

Code:

```
package Q_01;

public class Main {
    public static void main(String[] args) {
        int i =10;
        int count = 0;

        while (i <= 49) {
            if (count % 10 == 0 && count != 0) {
                System.out.print("\n");
            }
            System.out.printf("%d ",i);
            count++;
            i++;
        }
    }
}
```

Output:

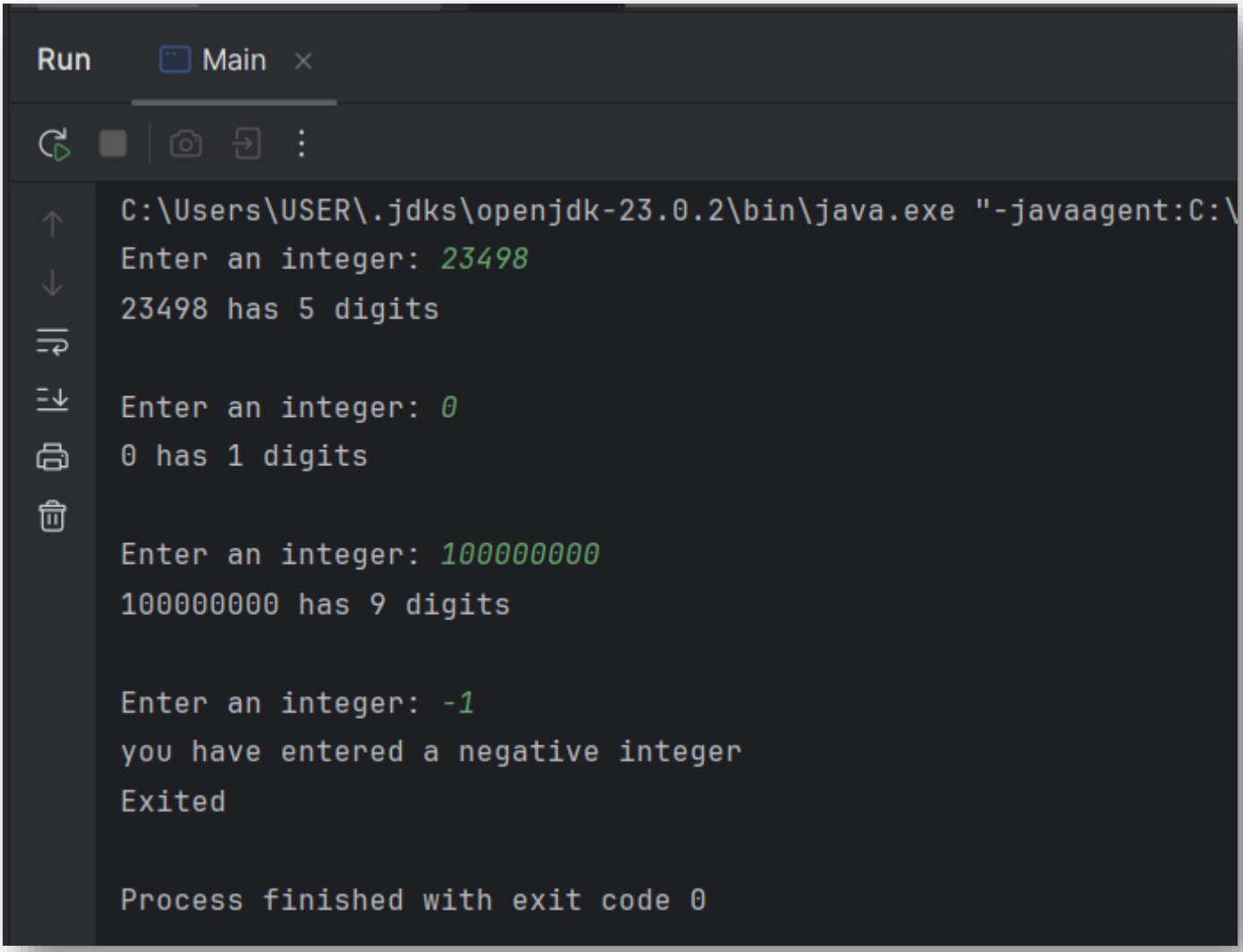


Q2

Code:

```
package Q_02;

import java.util.Scanner;

public class Main {

   public static int digitCount(int number) {

      int dCount = 0;

      if (number == 0)
         dCount = 1;

      while (number > 0) {
         number = number / 10;
         dCount++;
      }
      return dCount;
   }
    public static void main(String[] args) {

      Scanner input = new Scanner(System.in);
      int num;

      while(true) {
         System.out.print("Enter an integer: ");
         num = input.nextInt();

         if (num < 0) {
            System.out.println("you have entered a negative integer");
            System.out.println("Exited");
            break;

         } else {
            System.out.printf("%d has %d digits", num, digitCount(num));
            System.out.println("\n");

         }
      }
   }
}
```

Output:

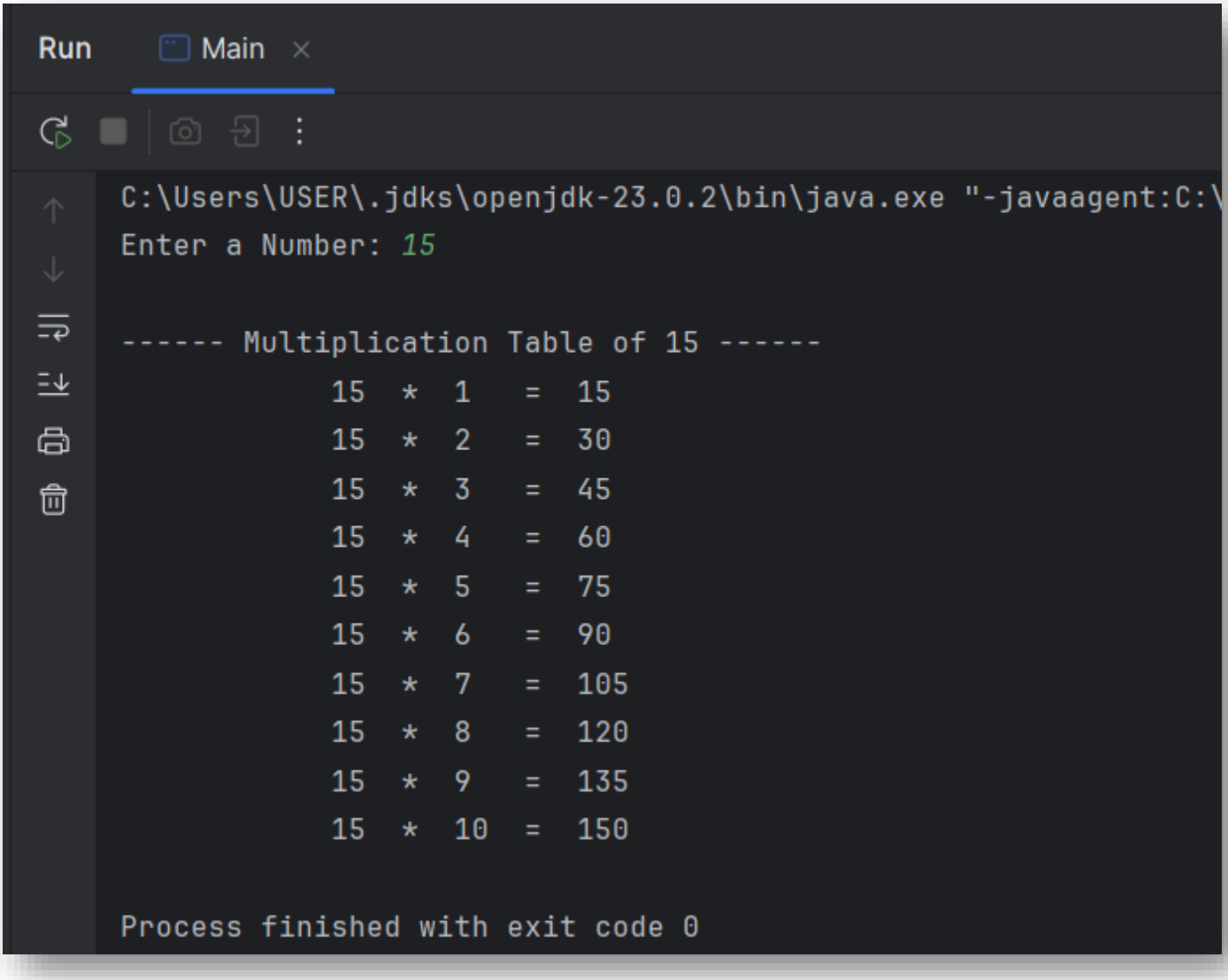

Run
Main
C:\Users\USER\.jdks\openjdk-23.0.2\bin\java.exe "-javaagent:C:\
Enter an integer: 23498
23498 has 5 digits
Enter an integer: 0
0 has 1 digits
Enter an integer: 100000000
100000000 has 9 digits
Enter an integer: -1
you have entered a negative integer
Exited
Process finished with exit code 0

Q3

Code:

```
package Q_03;

import java.util.Scanner;

public class Main {
   public static void main(String[] args) {

      Scanner input = new Scanner(System.in);

      System.out.print("Enter a Number: ");
      int N = input.nextInt();

      System.out.printf("\n------ Multiplication Table of %d ------\n", N);

      for (int i = 1; i <= 10; i++ ) {
         if (i == 10) // if selection used for better formatted output
            System.out.printf("\t\t\t%d  *  %d  =  %d\n", N, i, (N * i));
         else
            System.out.printf("\t\t\t%d  *  %d   =  %d\n", N, i, (N * i));
      }
   }
}
```

Output:

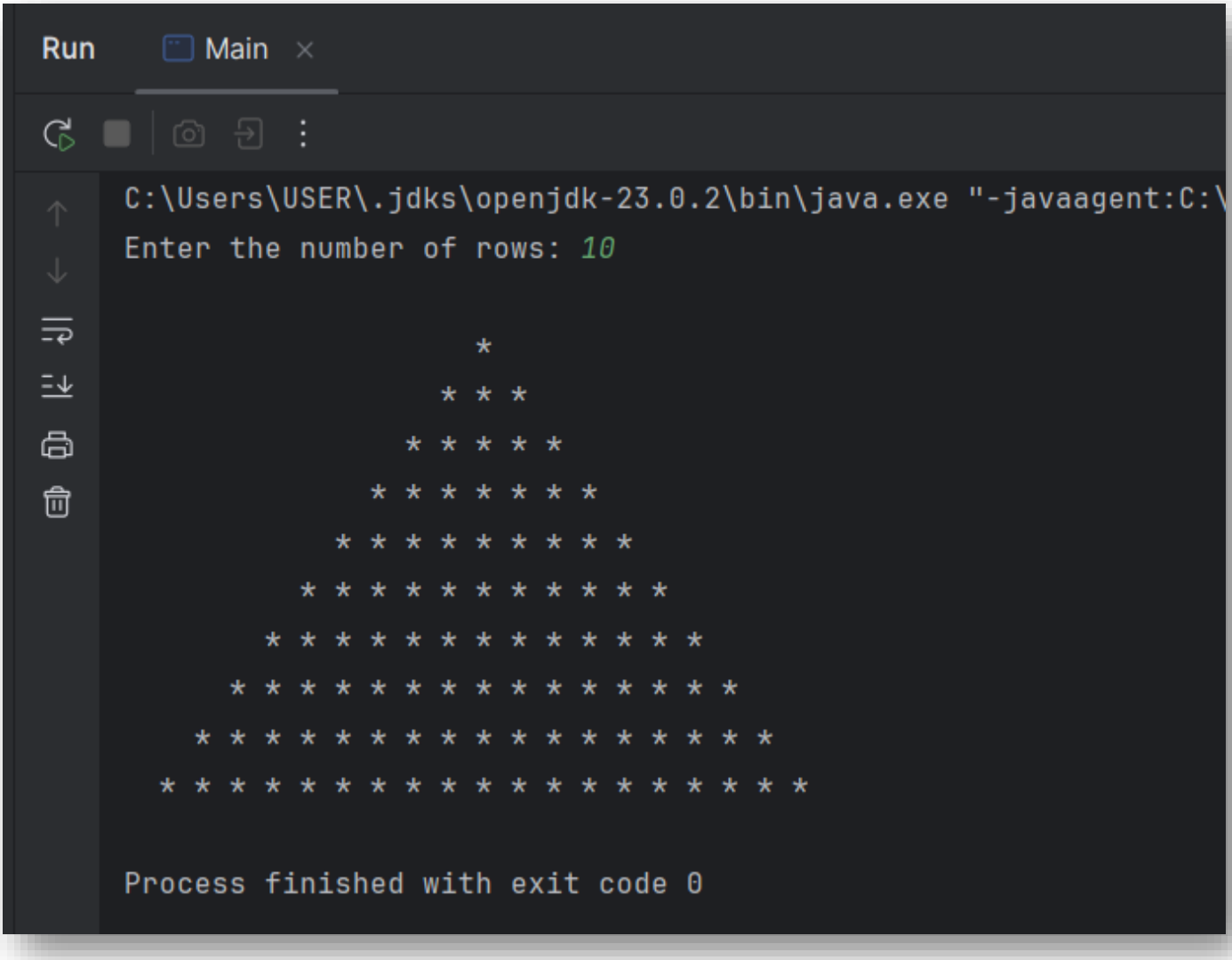

Run
Main
C:\Users\USER\.jdks\openjdk-23.0.2\bin\java.exe "-javaagent:C:\
Enter a Number: 15
------ Multiplication Table of 15 ------
15 * 1 = 15
15 * 2 = 30
15 * 3 = 45
15 * 4 = 60
15 * 5 = 75
15 * 6 = 90
15 * 7 = 105
15 * 8 = 120
15 * 9 = 135
15 * 10 = 150
Process finished with exit code 0

Q4

Code:

```
package Q_04;

import java.util.Scanner;

public class Main {
   public static void main(String[] args) {

      Scanner input = new Scanner(System.in);

      System.out.print("Enter the number of rows: ");
      int rows = input.nextInt();

      System.out.print("\n");

      for (int i = 1; i <= rows; i++) {
         for (int m = 1; m <= (rows + 1 - i); m++) {
            System.out.print("  ");

         }
         for (int j = 1; j <= (2 * i - 1); j++ ) {
            System.out.print("* ");

         }
         System.out.print("\n");

      }
   }
}
```

Output:

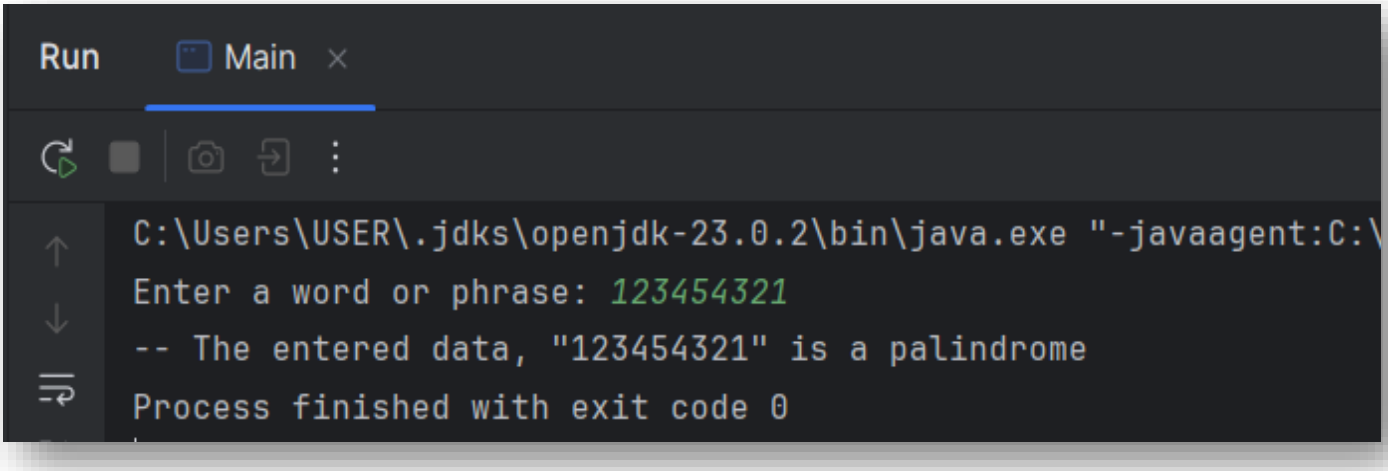

Run
Main
C:\Users\USER\.jdks\openjdk-23.0.2\bin\java.exe "-javaagent:C:\
Enter the number of rows: 10
*
* * *
* * * * *
* * * * * * *
* * * * * * * * *
* * * * * * * * * * *
* * * * * * * * * * * * *
* * * * * * * * * * * * * * *
* * * * * * * * * * * * * * * * *
* * * * * * * * * * * * * * * * * * *
Process finished with exit code 0

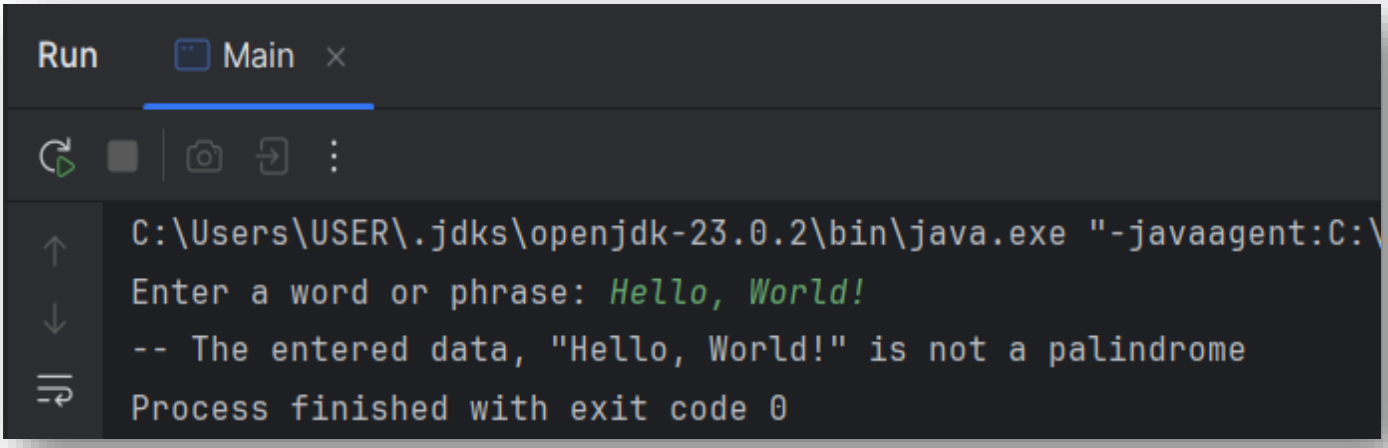
Q5

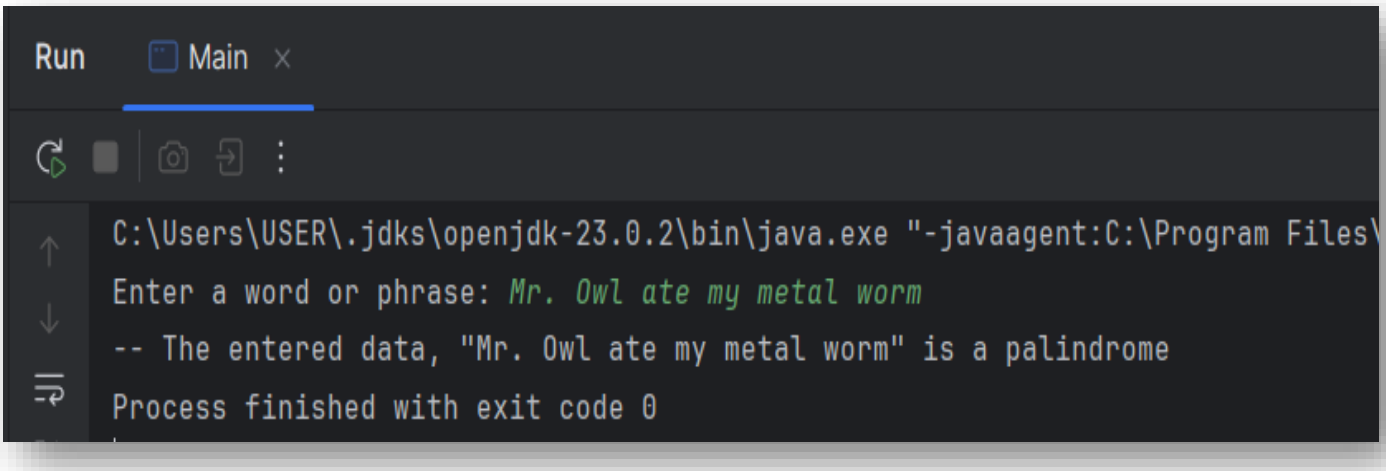
Code:

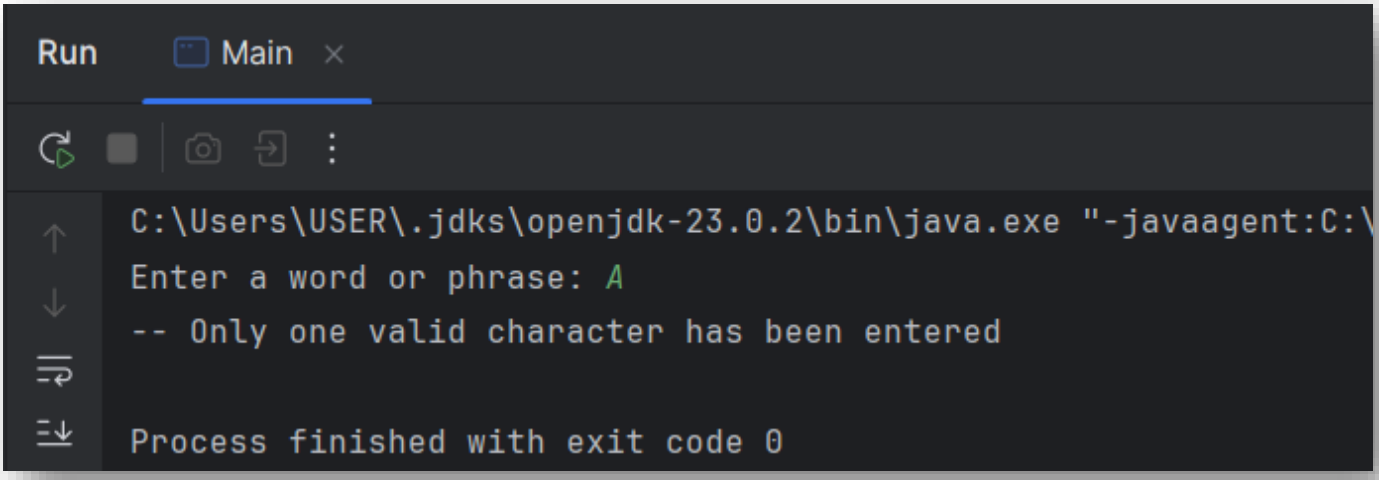
```
package Q_05;

import java.util.Scanner;

public class Main {
  public static void main(String[] args) {

    Scanner input = new Scanner(System.in);

    System.out.print("Enter a word or phrase: ");
    String text = input.nextLine();

    String temp = text.toLowerCase();
    String word = temp.replaceAll("[^a-zA-Z0-9]", "");

    int size = word.length();
    int start;
    int end = size - 1;
    int status = 0;

    if (size ==0)
      System.out.println("-- No valid characters were entered");
    else if (size == 1)
      System.out.println("-- Only one valid character has been entered");
    else {
      for (start = 0; start <= end; start++) {
        if (word.charAt(start) == word.charAt(end)) {
          status = 1;
          end--;

        } else {
          status = 0;
          break;
        }
      }

      if (status == 1)
        System.out.printf("-- The entered data, \"%s\" is a palindrome", text);
      else
        System.out.printf("-- The entered data, \"%s\" is not a palindrome", text);

    }
  }
}
```

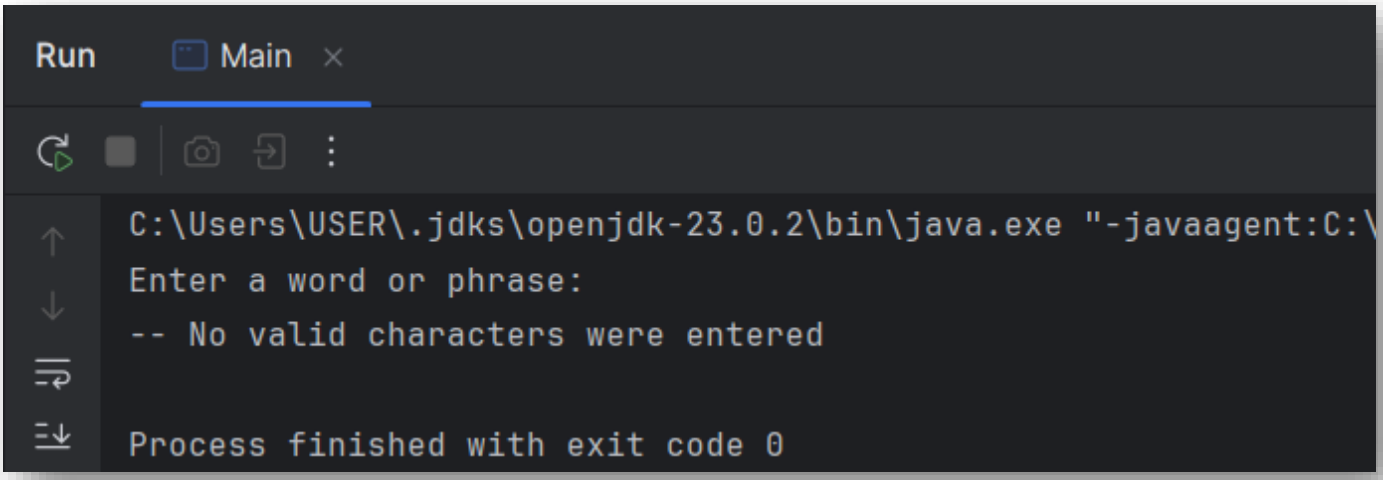
Output:


Run
Main
C:\Users\USER\.jdks\openjdk-23.0.2\bin\java.exe "-javaagent:C:\
Enter a word or phrase: 123454321
-- The entered data, "123454321" is a palindrome
Process finished with exit code 0


Run
Main
C:\Users\USER\.jdks\openjdk-23.0.2\bin\java.exe "-javaagent:C:\
Enter a word or phrase: Hello, World!
-- The entered data, "Hello, World!" is not a palindrome
Process finished with exit code 0


Run
Main
C:\Users\USER\.jdks\openjdk-23.0.2\bin\java.exe "-javaagent:C:\Program Files\
Enter a word or phrase: Mr. Owl ate my metal worm
-- The entered data, "Mr. Owl ate my metal worm" is a palindrome
Process finished with exit code 0


Run
Main
C:\Users\USER\.jdks\openjdk-23.0.2\bin\java.exe "-javaagent:C:\
Enter a word or phrase: A
-- Only one valid character has been entered
Process finished with exit code 0

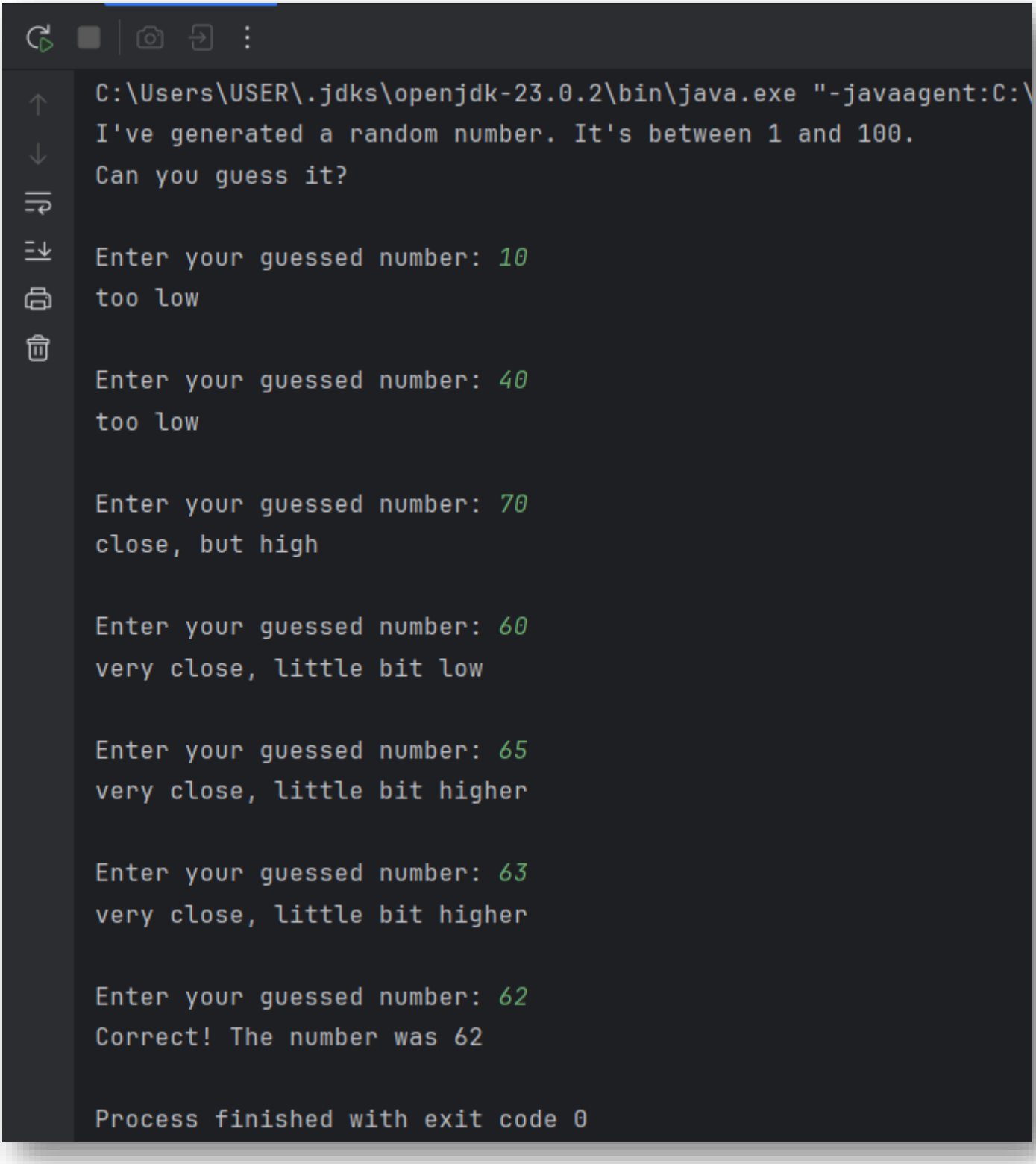

Run
Main
C:\Users\USER\.jdks\openjdk-23.0.2\bin\java.exe "-javaagent:C:\
Enter a word or phrase:
-- No valid characters were entered
Process finished with exit code 0

Q6

Code:

```
package Q_06;
import java.util.Scanner;
import java.util.Random;

public class Main {
   public static void main(String[] args) {

      Random random = new Random();
      int randomNum = random.nextInt(100) + 1;

      Scanner input = new Scanner(System.in);
      int num = 0;

      System.out.println("I've generated a random number. It's between 1 and 100.");
      System.out.println("Can you guess it?");

      while (num != randomNum) {
         System.out.print("\nEnter your guessed number: ");
         num = input.nextInt();

         if (num <= randomNum - 20)
            System.out.println("too low");
         else if (num <= randomNum - 10)
            System.out.println("lower");
         else if (num <= randomNum - 5)
            System.out.println("close, but low");
         else if (num < randomNum)
            System.out.println("very close, little bit low");
         else if (num >= randomNum + 20)
            System.out.println("too high");
         else if (num >= randomNum + 10)
            System.out.println("higher");
         else if (num >= randomNum + 5)
            System.out.println("close, but high");
         else if (num > randomNum)
            System.out.println("very close, little bit higher");
      }
      System.out.println("Correct! The number was " + randomNum);
   }
}
```

Output:


C:\Users\USER\.jdks\openjdk-23.0.2\bin\java.exe "-javaagent:C:\
I've generated a random number. It's between 1 and 100.
Can you guess it?
Enter your guessed number: 10
too low
Enter your guessed number: 40
too low
Enter your guessed number: 70
close, but high
Enter your guessed number: 60
very close, little bit low
Enter your guessed number: 65
very close, little bit higher
Enter your guessed number: 63
very close, little bit higher
Enter your guessed number: 62
Correct! The number was 62
Process finished with exit code 0

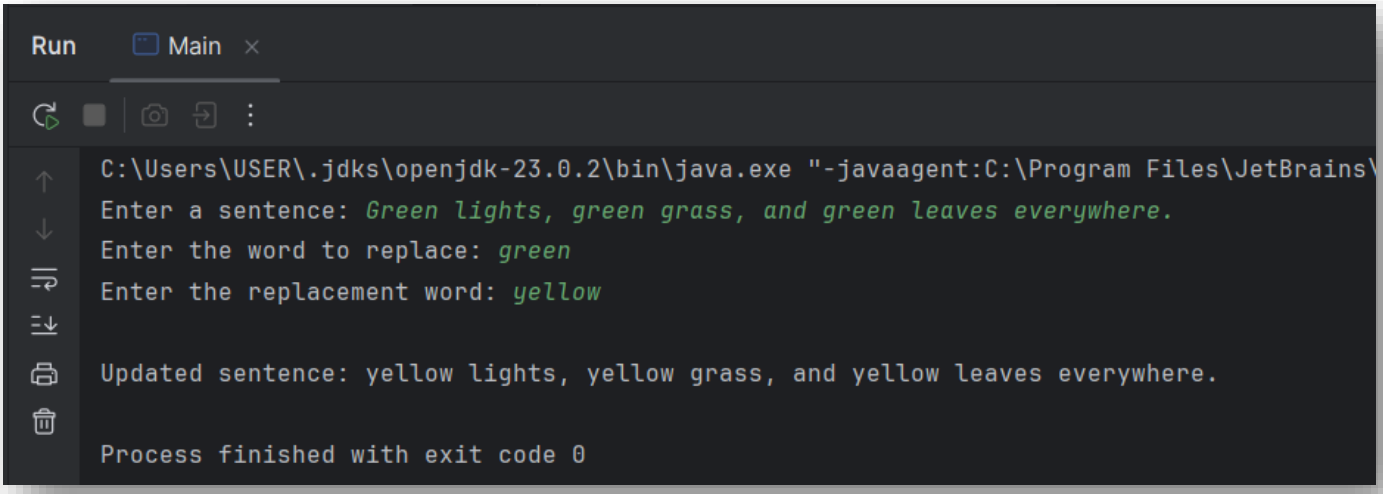
Q7

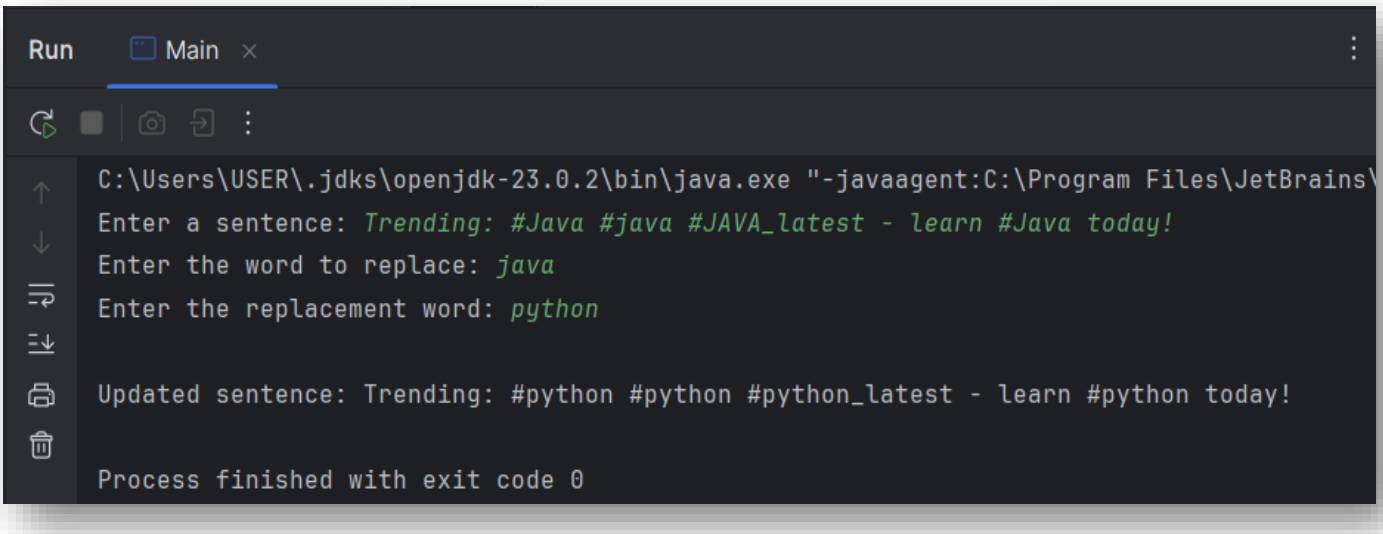
Code: Approach 1 – Main (Perform non-case-sensitive replacements, including words with symbols)

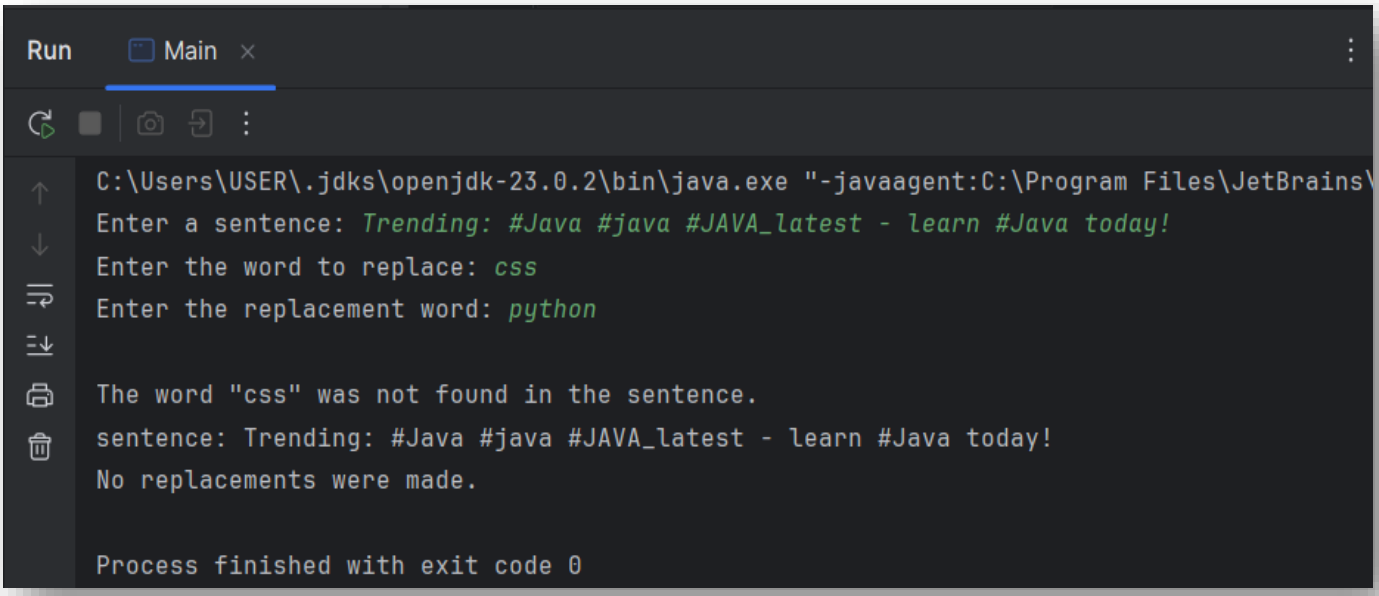
```
package Q_07;

import java.util.Scanner;

public class Main {
   public static void main(String[] args) {


      //If we want to do non-case-sensitive replacements including symbols


      Scanner input = new Scanner(System.in);

      System.out.print("Enter a sentence: ");
      String sentence = input.nextLine().trim();

      System.out.print("Enter the word to replace: ");
      String wReplace = input.nextLine().trim();

      System.out.print("Enter the replacement word: ");
      String rWord = input.nextLine().trim();

      String[] text = sentence.split("(?=\\W)|(?<=\\W)|(?=\\b)|(?<=\\b)|(?=_)|(?<=_)");

      int textSize = text.length;
      boolean wordFound = false;

      StringBuilder updatedText = new StringBuilder();

      for (int i = 0; i < textSize; i++) {
         if (text[i].equalsIgnoreCase(wReplace)) {
            updatedText.append(rWord);
            wordFound = true;

         } else
            updatedText.append(text[i]);

      }
```

```
    if (!wordFound) {
        System.out.println("\nThe word \"" + wReplace + "\" was not found in the sentence.");
        System.out.println("sentence: " + updatedText);
        System.out.println("No replacements were made.");

    } else
        System.out.println("\nUpdated sentence: " + updatedText);

  }
}
```

Output: Approach 1





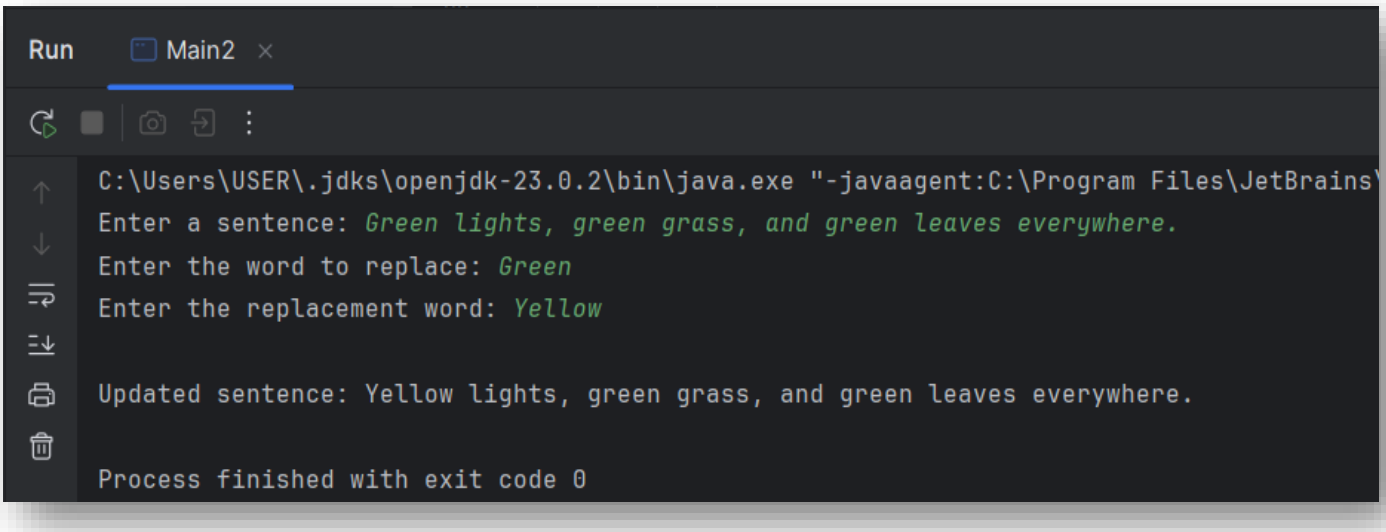


Code: Approach 2 – Main2 (Perform case-sensitive replacements, including words with symbols)

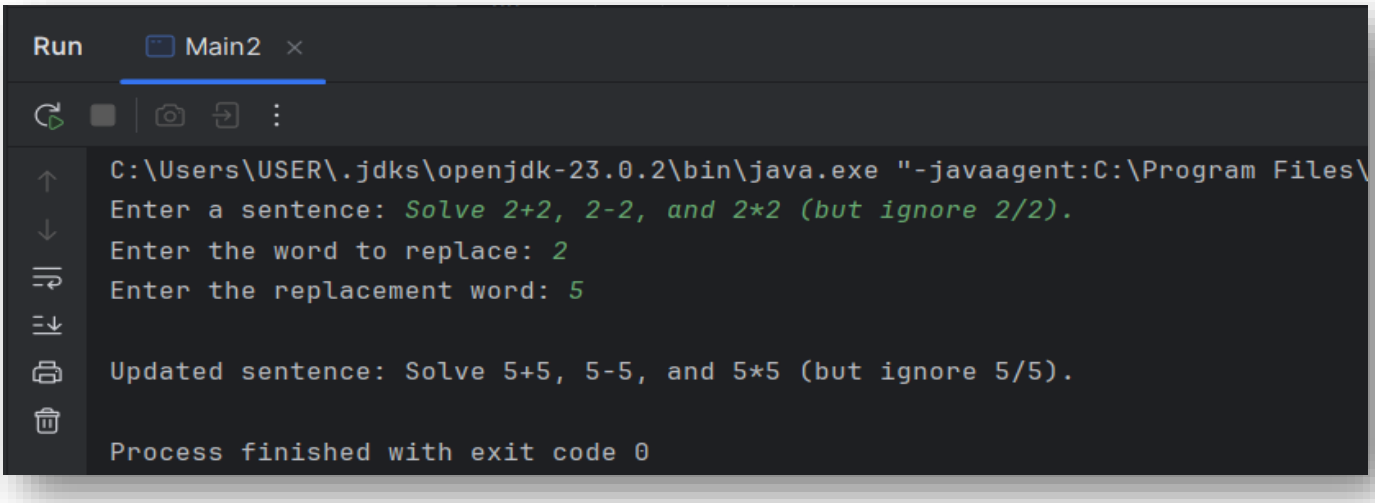
```
package Q_07;

import java.util.Scanner;

public class Main2 {
   public static void main(String[] args) {
      //If we want to do replacements of case-sensitive words with symbols
      Scanner input = new Scanner(System.in);

      System.out.print("Enter a sentence: ");
      String sentence = input.nextLine().trim();

      System.out.print("Enter the word to replace: ");
      String wReplace = input.nextLine().trim();

      System.out.print("Enter the replacement word: ");
      String rWord = input.nextLine().trim();

      String[] text = sentence.split("(?=\\W)|(?<=\\W)|(?=\\b)|(?<=\\b)|(?=_)|(?<=_)");

      int textSize = text.length;
      boolean wordFound = false;
```

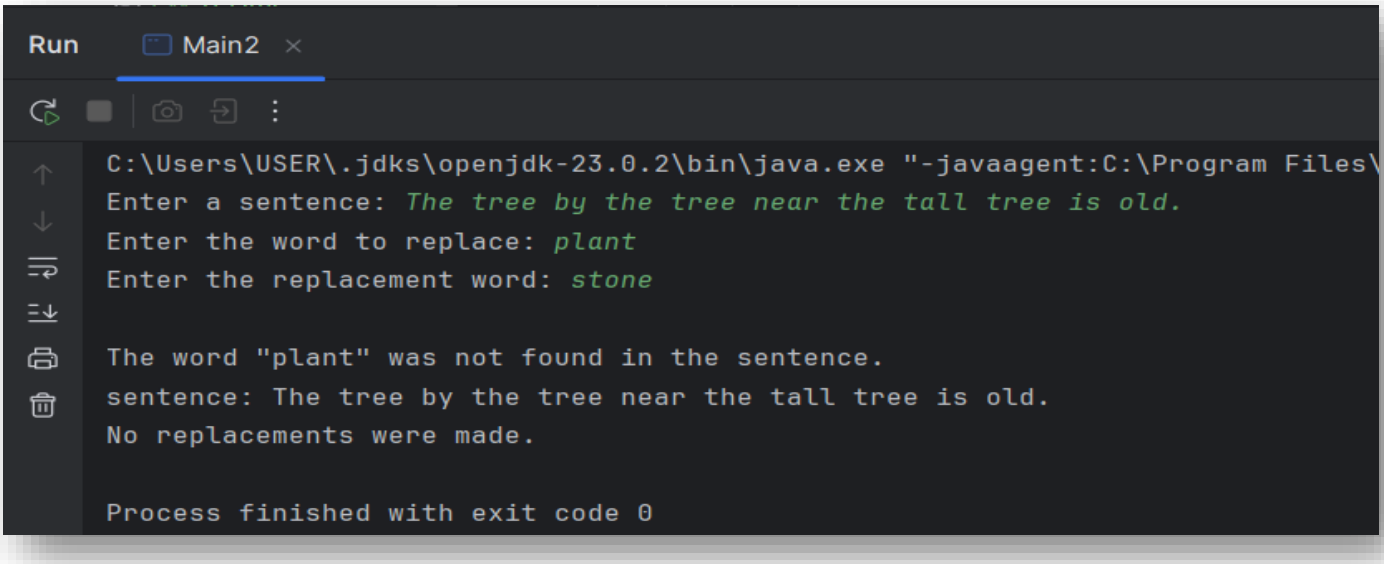
```
    StringBuilder updatedText = new StringBuilder();

    for (int i = 0; i < textSize; i++) {
      if (text[i].equals(wReplace)) {
        updatedText.append(rWord);
        wordFound = true;

      } else
        updatedText.append(text[i]);

    }

    if (!wordFound) {
      System.out.println("\nThe word \"" + wReplace + "\" was not found in the sentence.");
      System.out.println("sentence: " + updatedText);
      System.out.println("No replacements were made.");

    } else
      System.out.println("\nUpdated sentence: " + updatedText);

  }
}
```

Output: Approach 2




Run
Main2
C:\Users\USER\.jdks\openjdk-23.0.2\bin\java.exe "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA
Enter a sentence: Contact admin@site.com, admin@help.com, or ADMIN@support.com for help.
Enter the word to replace: admin
Enter the replacement word: jetbrains
Updated sentence: Contact jetbrains@site.com, jetbrains@help.com, or ADMIN@support.com for help.
Process finished with exit code 0


Run
Main2
C:\Users\USER\.jdks\openjdk-23.0.2\bin\java.exe "-javaagent:C:\Program Files\
Enter a sentence: Solve 2+2, 2-2, and 2*2 (but ignore 2/2).
Enter the word to replace: 2
Enter the replacement word: 5
Updated sentence: Solve 5+5, 5-5, and 5*5 (but ignore 5/5).
Process finished with exit code 0


Run
Main2
C:\Users\USER\.jdks\openjdk-23.0.2\bin\java.exe "-javaagent:C:\Program Files\
Enter a sentence: The tree by the tree near the tall tree is old.
Enter the word to replace: plant
Enter the replacement word: stone
The word "plant" was not found in the sentence.
sentence: The tree by the tree near the tall tree is old.
No replacements were made.
Process finished with exit code 0