

Q1

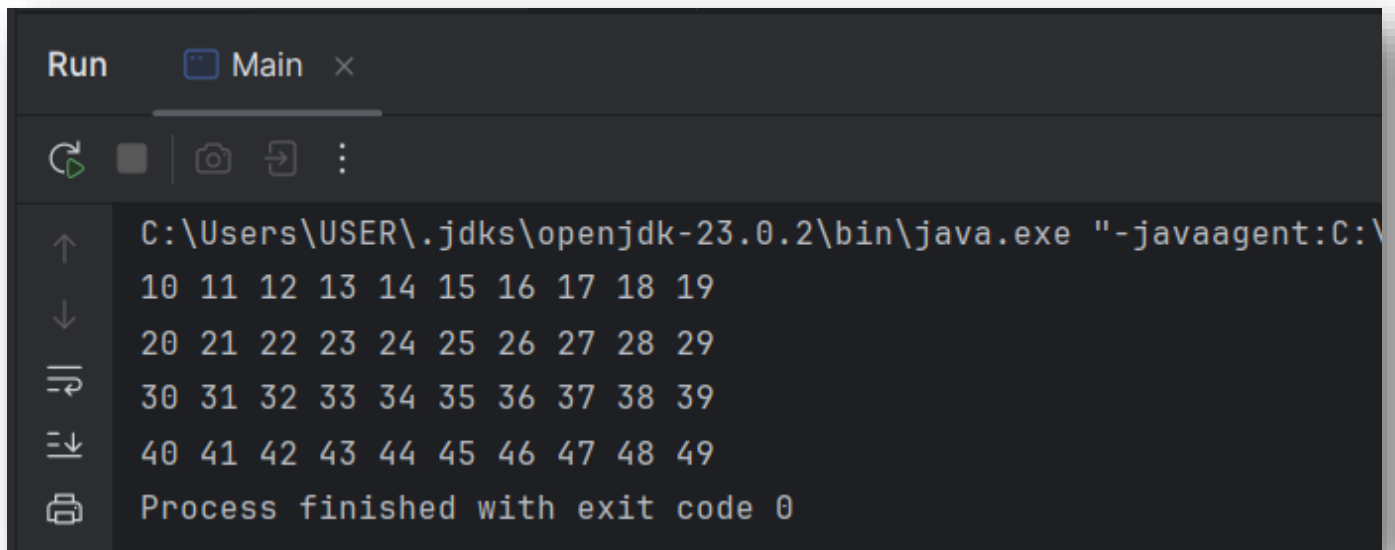
Code:

```
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:



```
Run  Main x
C:\Users\USER\.jdk\openjdk-23.0.2\bin\java.exe -javaagent:C:\...
10 11 12 13 14 15 16 17 18 19
20 21 22 23 24 25 26 27 28 29
30 31 32 33 34 35 36 37 38 39
40 41 42 43 44 45 46 47 48 49
Process finished with exit code 0
```

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;
    }

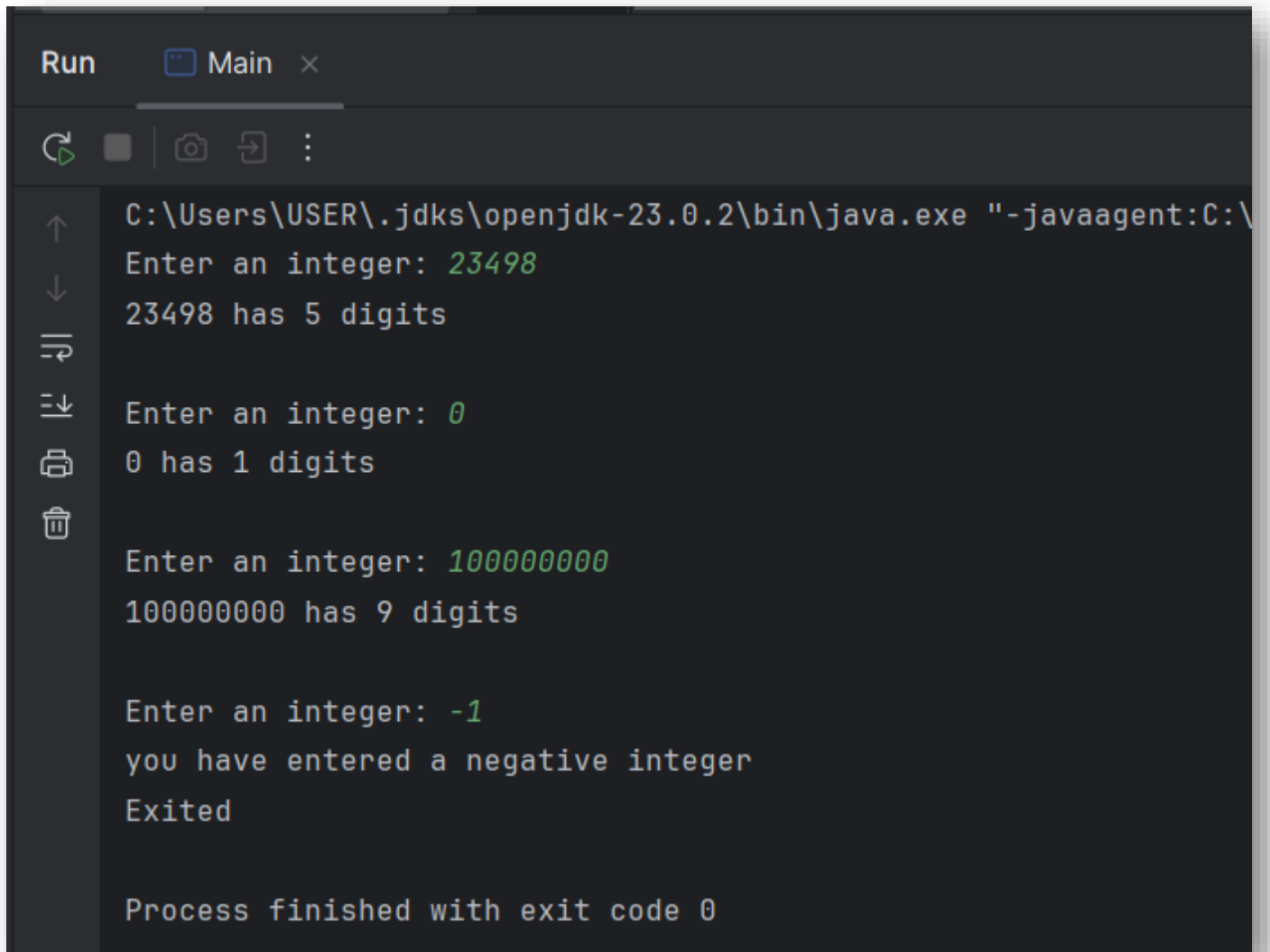
    public static void main(String[] args) {

        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:



The screenshot shows a Java IDE's Run console window. The title bar indicates the file is 'Main'. The console output shows the execution of a Java program. The command line at the top shows the Java executable path and the '-javaagent' option. The program prompts the user to 'Enter an integer:'. The user enters '23498', and the program outputs '23498 has 5 digits'. The user then enters '0', and the program outputs '0 has 1 digits'. Next, the user enters '100000000', and the program outputs '100000000 has 9 digits'. Finally, the user enters '-1', and the program outputs 'you have entered a negative integer' and 'Exited'. The console concludes with 'Process finished with exit code 0'.

```
Run Main x
C:\Users\USER\.jdk\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) {

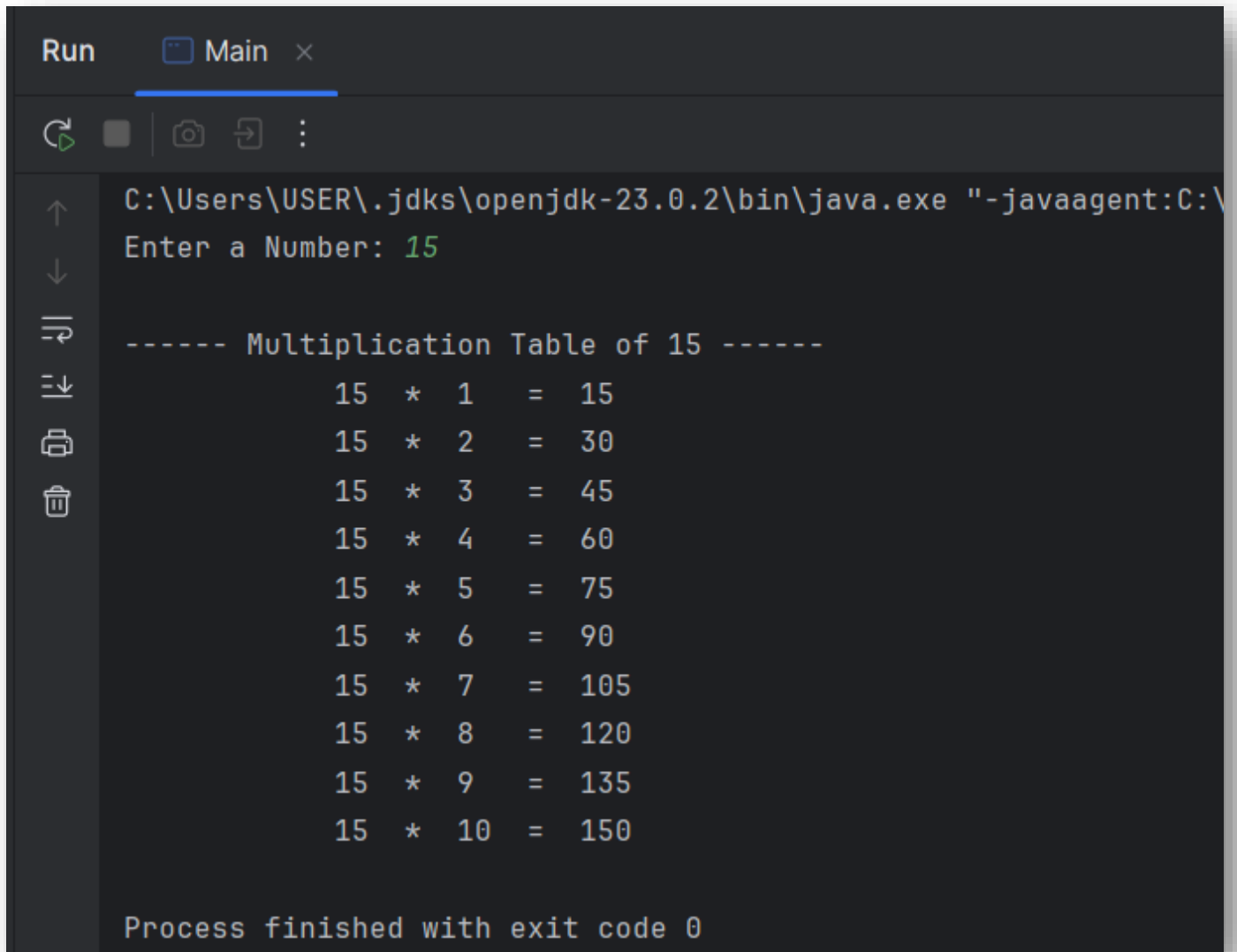
        Scanner input = new Scanner(System.in);

        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:



The screenshot shows a Java IDE's Run window. The title bar says "Run" and "Main". The command line shows the execution of `java.exe` with the `-javaagent` option. The input is `15`. The output is a multiplication table for 15, followed by the message "Process finished with exit code 0".

```
C:\Users\USER\.jdk\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 x
C:\Users\USER\.jdk\openjdk-23.0.2\bin\java.exe "-javaagent:C:\Users\USER\AppData\Local\Temp\jbr-23.0.2\bin\javaagent.jar"
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 x
C:\Users\USER\.jdk\openjdk-23.0.2\bin\java.exe "-javaagent:C:\Program Files\
Enter a word or phrase: 123454321
-- The entered data, "123454321" is a palindrome
Process finished with exit code 0
```

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

```
Run  Main x
C:\Users\USER\.jdk\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 x
C:\Users\USER\.jdk\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 x
C:\Users\USER\.jdk\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;

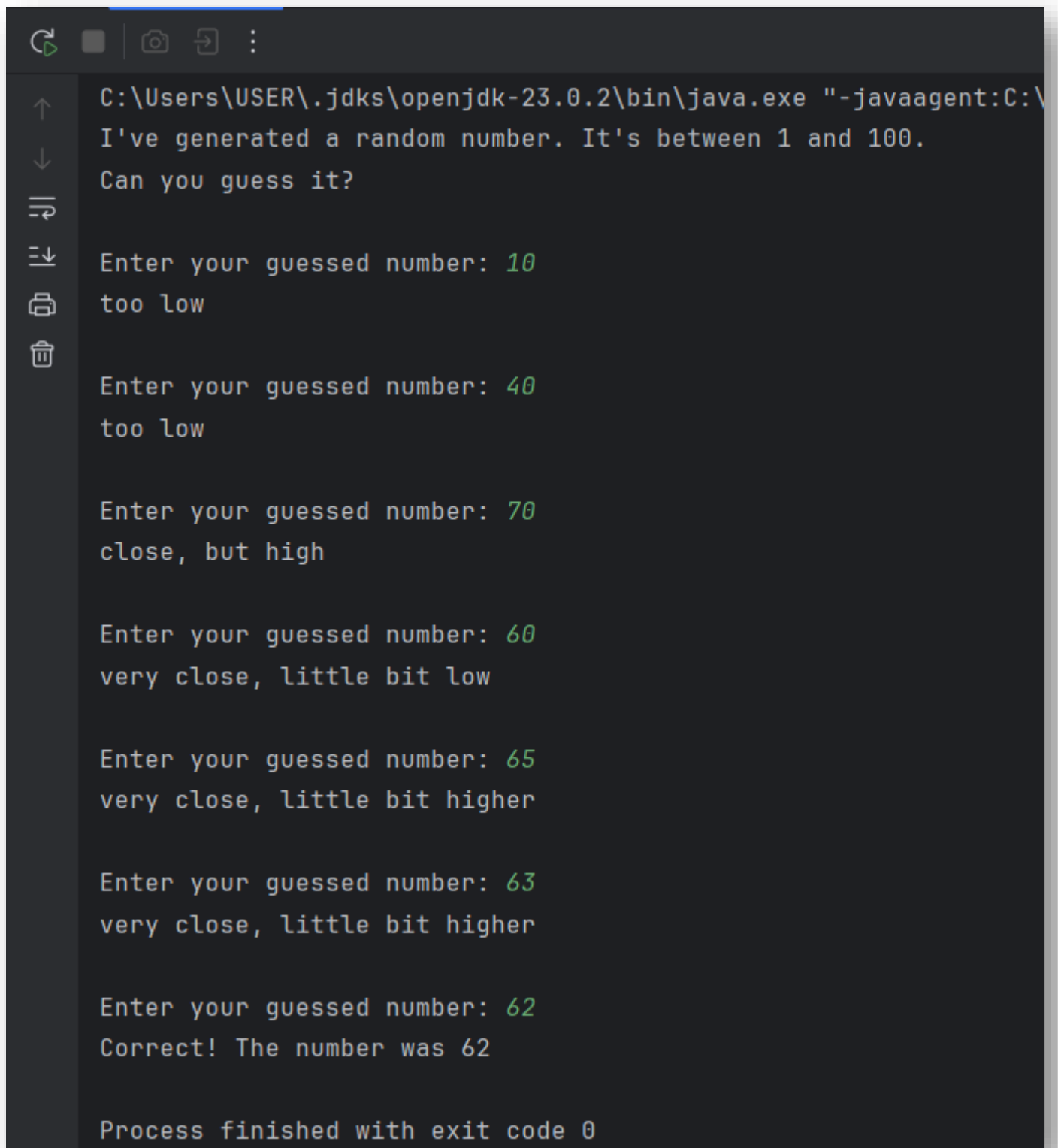
        Scanner input = new Scanner(System.in);
        int num = 0;

        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:

A terminal window with a dark background and light gray text. The window title bar is at the top with standard Windows icons. The command prompt shows the execution of a Java program. The program generates a random number between 1 and 100 and asks the user to guess it. The user enters several numbers, and the program provides feedback: 'too low', 'close, but high', 'very close, little bit low', and 'very close, little bit higher'. Finally, the user enters 62, and the program outputs 'Correct! The number was 62'. The process finishes with exit code 0.

```
C:\Users\USER\.jdk\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();

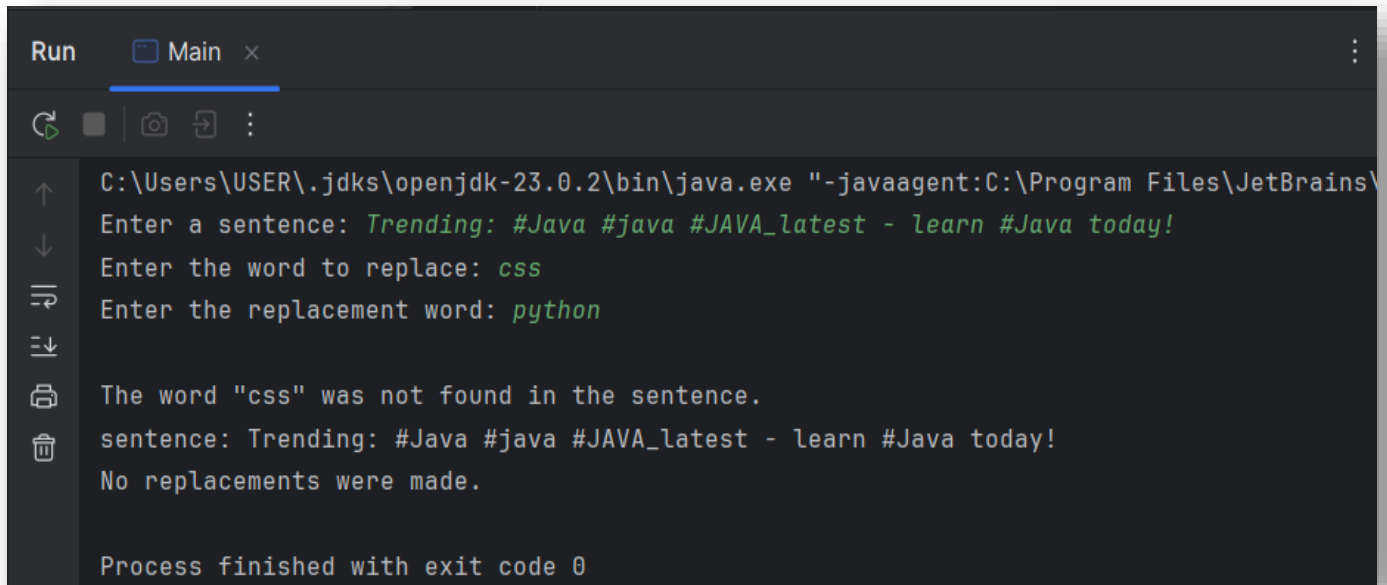
        for (int i = 0; i < textSize; i++) {
            if (text[i].equalsIgnoreCase(wReplace)) {
                updatedText.append(rWord);
                wordFound = true;
            } else
                updatedText.append(text[i]);
        }
    }
}
```

```
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

```
Run Main x  
C:\Users\USER\.jdk\openjdk-23.0.2\bin\java.exe "-javaagent:C:\Program Files\JetBrains\  
Enter a sentence: Green lights, green grass, and green leaves everywhere.  
Enter the word to replace: green  
Enter the replacement word: yellow  
Updated sentence: yellow lights, yellow grass, and yellow leaves everywhere.  
Process finished with exit code 0
```

```
Run Main x  
C:\Users\USER\.jdk\openjdk-23.0.2\bin\java.exe "-javaagent:C:\Program Files\JetBrains\  
Enter a sentence: Trending: #Java #java #JAVA_latest - learn #Java today!  
Enter the word to replace: java  
Enter the replacement word: python  
Updated sentence: Trending: #python #python #python_latest - learn #python today!  
Process finished with exit code 0
```



```
Run Main x
C:\Users\USER\.jdk\openjdk-23.0.2\bin\java.exe "-javaagent:C:\Program Files\JetBrains\
Enter a sentence: Trending: #Java #java #JAVA_latest - learn #Java today!
Enter the word to replace: css
Enter the replacement word: python

The word "css" was not found in the sentence.
sentence: Trending: #Java #java #JAVA_latest - learn #Java today!
No replacements were made.

Process finished with exit code 0
```

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 x
C:\Users\USER\.jdk\openjdk-23.0.2\bin\java.exe "-javaagent:C:\Program Files\JetBrains\
Enter a sentence: Green lights, green grass, and green leaves everywhere.
Enter the word to replace: Green
Enter the replacement word: Yellow
Updated sentence: Yellow lights, green grass, and green leaves everywhere.
Process finished with exit code 0

```



```
Run Main2 x
C:\Users\USER\.jdk\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 x
C:\Users\USER\.jdk\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 x
C:\Users\USER\.jdk\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
```