```java
 1/*Assignment01-Q3
 8package JAVA_EXPS ;
 9import java.util.Scanner;
10public class Assignment01 {
11 public static void main(String[] args) {
12
13     Scanner scanner = new Scanner(System.in);
14
15     String inputString;
16
17     while (true)
18     {
19         System.out.println("String Manipulation Tool");
20         System.out.println("1.Reverse a String");
21         System.out.println("2.Check for Palindrome");
22         System.out.println("3.Count Vowels and
   Consonants");
23         System.out.println("4.Convert to Uppercase and
   Lowercase");
24         System.out.println("5.Find Substring");
25         System.out.println("6.Exit");
26
27         System.out.print("Choose an option:");
28         int choice = scanner.nextInt();
29         scanner.nextLine();
30
31    switch (choice)
32     {
33      case 1:
34         System.out.print("Enter a string: ");
35         inputString = scanner.nextLine();
36         System.out.println("Reversed String: " +
   reverseString(inputString));
37         break;
```

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38
39      case 2:
40          System.out.print("Enter a string:");
41          inputString = scanner.nextLine();
42          System.out.println("Is Palindrome: " +
   isPalindrome(inputString));
43          break;
44
45      case 3:
46          System.out.print("Enter a string:");
47          inputString = scanner.nextLine();
48          countVowelsAndConsonants(inputString);
49          break;
50
51      case 4:
52          System.out.print("Enter a string:");
53          inputString = scanner.nextLine();
54          System.out.println("Uppercase:" +
   inputString.toUpperCase());
55          System.out.println("Lowercase:" +
   inputString.toLowerCase());
56          break;
57
58      case 5:
59          System.out.print("Enter the main string:");
60          String mainString = scanner.nextLine();
61          System.out.print("Enter the substring to find: ");
62          String substring = scanner.nextLine();
63          System.out.println("Substring exists:" +
   mainString.contains(substring));
64          break;
65
66      case 6:
67          System.out.println("Thank You!");
```

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68          System.out.println("Name:SAGARIKA SRIVASTAVA
   \nUIN:231P047\nROLL NO :44\n");
69          scanner.close();
70          return;
71
72      default:
73          System.out.println("Invalid choice! Please choose
   a valid option.");
74        }
75
76   }
77 }
78
79 private static String reverseString(String str)
80 {
81   return new StringBuilder(str).reverse().toString();
82 }
83
84 private static boolean isPalindrome(String str)
85 {
86     String cleanedStr = str.replaceAll("[^a-zA-Z0-9]",
   "").toLowerCase();
87     return cleanedStr.equals(reverseString(cleanedStr));
88 }
89
90 private static void countVowelsAndConsonants(String str)
91 {
92     int vowels = 0;
93     int consonants = 0;
94
95     String lowerStr = str.toLowerCase();
96
97     for (char c : lowerStr.toCharArray())
98     {
```

```java
 99            if (Character.isLetter(c))
100            {
101                if (("aeiou".indexOf(c))!= -1)
102                {
103                    vowels++;
104                }
105                else
106                {
107                    consonants++;
108                }
109            }
110        }
111
112     System.out.println("Vowels: " + vowels);
113     System.out.println("Consonants: " + consonants);
114
115 }
116 }
117
```