Experiment Title: 2.1

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EXPERIMENT – 3.1

1. Aim/Overview of the practical:

Create a palindrome creator application for making a longest possible palindrome out of given input string.

2. Task to be done

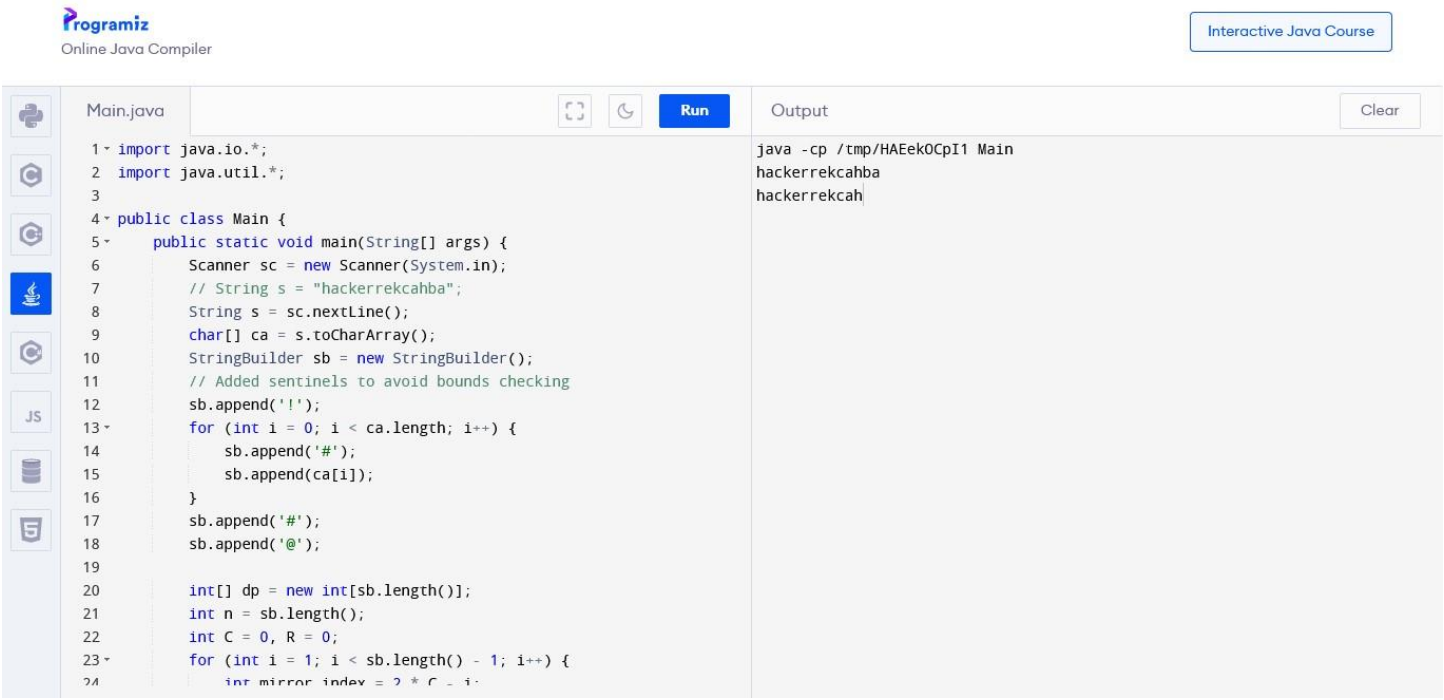
Given a string, find the longest substring which is a palindrome.

3. Code

```
import java.io.*; import
java.util.*;

public class Main {
        public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
                // String s = "hackerrekcahba";
                String s = sc.nextLine();
                char[] ca = s.toCharArray();
                StringBuilder sb = new StringBuilder();
                // Added sentinels to avoid bounds checking
                sb.append('!');
                 for (int i = 0; i < ca.length; i++) {
                        sb.append('#');
```

```
                sb.append(ca[i]);
            } sb.append('#');
            sb.append('@');

            int[] dp = new int[sb.length()]; int n = sb.length(); int C =
            0, R = 0; for (int i = 1; i < sb.length() - 1; i++) {  int
            mirror_index = 2 * C - i;          dp[i] = (R > i) ? Math.min(R
            - i, dp[mirror_index]) : 0;

                while (sb.charAt(i + 1 + dp[i]) == sb.charAt(i - 1 - dp[i])) {
                    dp[i]++;
                }

                if (i + dp[i] > R) {
                    C = i;
                    R = i + dp[i];
                }
            }

            int maxLen = 0; int centerIndex = 0;
            for (int i = 0; i < sb.length() - 1; i++) {
                if (dp[i] > maxLen) {
                    maxLen = dp[i];
                centerIndex = i;
                }
            }

            System.out.println(s.substring((centerIndex - 1 - maxLen) / 2,
                    (centerIndex - 1 + maxLen) / 2));




        }
}
```

4. Output



5. Learning Outcome

string is called a palindrome string if the reverse of that string is the same as the original string. For example, radar, level, etc.

Similarly, a number that is equal to the reverse of that same number is called a palindrome number. For example, **3553**, **12321**, etc.