Java Coding Challenges - Part 6: String API

1. Challenge: Use charAt(), length(), and substring() methods

```java
public class StringMethods {
    public static void main(String[] args) {
        String text = "HelloWorld";
        System.out.println("Char at index 1: " + text.charAt(1));
        System.out.println("Length: " + text.length());
        System.out.println("Substring (0, 5): " + text.substring(0, 5));
    }
}
```

2. Challenge: Count the number of vowels in a string

```java
public class CountVowels {
    public static void main(String[] args) {
        String str = "OpenAI ChatGPT";
        int count = 0;
        for (char c : str.toLowerCase().toCharArray()) {
            if ("aeiou".indexOf(c) != -1) {
                count++;
            }
        }
        System.out.println("Number of vowels: " + count);
    }
}
```

3. Challenge: Check if a string is a palindrome

```java
public class PalindromeCheck {
    public static void main(String[] args) {
        String original = "madam";
        String reversed = new StringBuilder(original).reverse().toString();
        if (original.equals(reversed)) {
            System.out.println(original + " is a palindrome.");
        } else {
            System.out.println(original + " is not a palindrome.");
        }
    }
}
```

4. Challenge: Convert a string to upper case and lower case

```java
public class CaseConversion {
    public static void main(String[] args) {
```

```java
        String text = "JavaProgramming";

        System.out.println("Upper Case: " + text.toUpperCase());

        System.out.println("Lower Case: " + text.toLowerCase());

    }

}
```

5. Challenge: Remove spaces and special characters from a string

```java
public class CleanString {

    public static void main(String[] args) {

        String str = "Hello @World! 123";

        String cleaned = str.replaceAll("[^a-zA-Z0-9]", "");

        System.out.println("Cleaned String: " + cleaned);

    }

}
```