Q1:

Program:

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

        String str1 = "Programming";

        String str2 = new String( original: "Java Programming");

        char[] charArray = {'J','a','v','a',' ','P','r','o','g','r','a','m','m','i','n','g'};
        String str3 = new String(charArray);
        System.out.println("Comparing str1 and str2  : " + (str1 == str2));
        System.out.println("Comparing str1 and str2 : " + str1.equals(str2));

        System.out.println("Comparing str1 and str3 : " + (str1 == str3));
        System.out.println("Comparing str1 and str3 ': " + str1.equals(str3));

        System.out.println("\nExplanation:");
        System.out.println("'==' compares references (memory addresses), not actual content.");
        System.out.println("'.equals()' compares the content of the strings.");
        String quote = "Programming Quote:\n\t\"Code is poetry\" - Unknown\n\tPath: C:\\Java\\Projects";
        System.out.println("\n" + quote);
    }
}
```

OUTPUT:

```
"C:\Program Files\Java\jdk-21\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2025.2\lib\idea_rt.jar=60312" -Dfile.encoding=UTF-8 -Dsun.s
Comparing str1 and str2  : false
Comparing str1 and str2 : false
Comparing str1 and str3 : false
Comparing str1 and str3 ': false
```

Q2:
PROGRAM:

```java
public class StringMethods {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);


        System.out.print("Enter your full name: ");
        String fullName = scanner.nextLine();


        System.out.print("Enter your favorite programming language: ");
        String programmingLanguage = scanner.nextLine();


        System.out.print("Enter a sentence about your programming experience: ");
        String experienceSentence = scanner.nextLine();

        int charCount = experienceSentence.replace( target: " ",  replacement: "").length();

        String languageUpper = programmingLanguage.toUpperCase();
        System.out.println("First Name: " + fullName);
        System.out.println("Favorite Language (uppercase): " + languageUpper);
        System.out.println("Experience sentence character count (no spaces): " + charCount);
        System.out.println("Original Experience: " + experienceSentence);

        scanner.close();
    }
}
```

Output:

"C:\Program Files\Java\jdk-21\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2025.2\lib\idea_rt.jar=60018" -Dfile.encoding=UTF-8 -Dsun.std
Enter your full name: rishit asthana
Enter your favorite programming language: java
Enter a sentence about your programming experience: java is best
First Name: rishit asthana
Favorite Language (uppercase): JAVA
Experience sentence character count (no spaces): 10
Original Experience: java is best

Process finished with exit code 0

Q3:
Program:

```java
import java.util.Scanner;

public class StringArraysAndMethods {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);

        System.out.print("Enter number of students: ");
        int n = sc.nextInt();
        sc.nextLine();

        String[] students = new String[n];

        for (int i = 0; i < n; i++) {
            System.out.print("Enter name: ");
            students[i] = sc.nextLine();
        }

        System.out.println("Student Names:");
        for (int i = 0; i < n; i++) {
            System.out.println(students[i]);
        }
    }
}
```

OUTPUT:

```
"C:\Program Files\Java\jdk-21\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2025.2\lib\idea_rt.jar=60061" -Dfile.encoding=UTF-8 -Dsun.std
Enter number of students: 2
Enter name: ri
Enter name: ki
Student Names:
ri
ki

Process finished with exit code 0
```

Q4:
Program:

```java
import java.util.Scanner;

public class TextProcessor {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);

        System.out.print("Enter a line of text: ");
        String text = sc.nextLine();

        System.out.println("You entered: " + text);
        System.out.println("Length: " + text.length());
        System.out.println("Uppercase: " + text.toUpperCase());
        System.out.println("Lowercase: " + text.toLowerCase());
        System.out.println("Replace spaces with '-': " + text.replace( target: " ", replacement: "-"));
        if (text.length() >= 5) {
            System.out.println("First 5 characters: " + text.substring(0, 5));
        }
    }
}
```

Output :

```
"C:\Program Files\Java\jdk-21\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2025.2\lib\idea_rt.jar=60093" -Dfile.encoding=UTF-8 -Dsun.std
Enter a line of text: hello world
You entered: hello world
Length: 11
Uppercase: HELLO WORLD
Lowercase: hello world
Replace spaces with '-': hello-world
First 5 characters: hello

Process finished with exit code 0
```