

Task1:

```
import java.util.Scanner;

public class Task1 {

    public static void main(String[] args) {

        Scanner in = new Scanner(System.in);

        System.out.println("Md. Nafijur Rahaman\n\n");

        System.out.print("Enter your String: ");

        String s1 = in.nextLine();

        String words[] = s1.split(" ");

        String rev = "";

        for (int i = words.length - 1; i >= 0; i--) {

            rev += words[i] + " ";

        }

        System.out.println(rev);

        System.out.println("\n\n20234103116");

    }

}
```

Output:

```
HP@Tanjid MINGW64 /a/Others/2025 FALL/Advance
Progammimg/FINAL/String
• $ java Task1.java
Md. Nafijur Rahaman

Enter your String: java is fun
fun is java

20234103116
```

Task2:

```
import java.util.Scanner;

public class Task2 {

    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        System.out.println("Md. Nafijur Rahaman\n");
        System.out.print("Enter your String: ");
        String s1 = input.nextLine();
        String rev = "";
        for (int i = s1.length() - 1; i >= 0; i--) {
            rev += s1.charAt(i);
        }
        boolean isEqual = s1.equals(rev);
        if (isEqual) {
            System.out.print("Palindrome");
        } else {
            System.out.println("Not Palindrome");
        }
        System.out.println("\n\n20234103116");
    }
}
```

Output:

```
HP@Tanjid MINGW64 /a/Others/2025 FAL
L/Advance Progammimg/FINAL/String
$ java Task2.java
Md. Nafijur Rahaman

Enter your String: madam
Palindrome

20234103116
```

Task3:

```
import java.util.Scanner;

public class Task3 {

    public static void main(String[] args) {
        Scanner in = new Scanner(System.in);
        System.out.println("Md. Nafijur Rahaman\n");
        System.out.print("Enter a string: ");
        String s = in.nextLine();
        String result = "" + s.charAt(0);

        for (int i = 1; i < s.length(); i++) {
            if (s.charAt(i) != s.charAt(i - 1)) {
                result += s.charAt(i);
            }
        }

        System.out.println(result);
        System.out.println("\n\n20234103116");
    }
}
```

Output:

```
HP@Tanjid MINGW64 /a/Others/2025 FAL
L/Advance Programming/FINAL/String
$ java Task3.java
Md. Nafijur Rahaman

Enter a string: aabbccaa
abca

20234103116
```

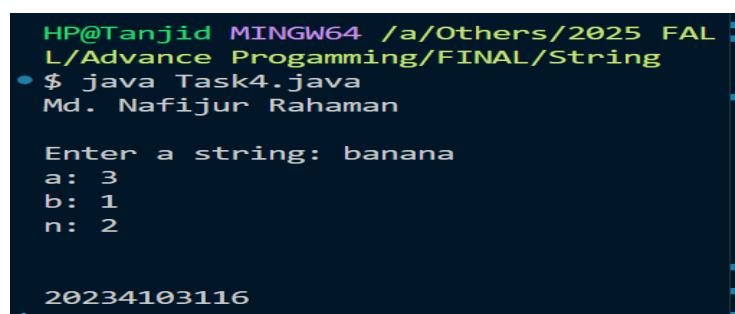
Task4:

```
import java.util.Scanner;

public class Task4 {

    public static void main(String[] args) {
        Scanner in = new Scanner(System.in);
        System.out.println("Md. Nafijur Rahaman\n");
        System.out.print("Enter a string: ");
        String s = in.nextLine().toLowerCase();
        int freq[] = new int[26];
        for (int i = 0; i < s.length(); i++) {
            if (s.charAt(i) >= 'a' & s.charAt(i) <= 'z') {
                freq[s.charAt(i) - 'a']++;
            }
        }
        for (int i = 0; i < 26; i++) {
            if (freq[i] > 0) {
                System.out.println((char) (i + 'a') + ": " + freq[i]);
            }
        }
        System.out.println("\n\n20234103116");
    }
}
```

Output:



```
HP@Tanjid MINGW64 /a/Others/2025_FAL_L/Advance_Progammimg/FINAL/String
$ java Task4.java
Md. Nafijur Rahaman

Enter a string: banana
a: 3
b: 1
n: 2

20234103116
```

Task5:

```
import java.util.Scanner;

public class Task5{

    public static int CompareTo(String s1, String s2){

        int len = Math.min(s1.length(), s2.length());

        for(int i = 0; i<len; i++){

            if(s1.charAt(i)!=s2.charAt(i)){

                return s1.charAt(i) - s2.charAt(i);

            }

        }

        return s1.length()-s2.length();

    }

    public static void main(String[] args) {

        Scanner in = new Scanner(System.in);

        System.out.println("Md. Nafijur Rahaman\n");

        System.out.print("Enter a string: ");

        String s1 = in.nextLine();

        System.out.print("Enter second string: ");

        String s2 = in.nextLine();

        int res = CompareTo(s1, s2);

        System.out.println(res);

        System.out.println("\n\n20234103116");

    }

}
```

Output:

```
HP@Tanjid MINGW64 /a/Others/2025 FALL/Adva .:
nce Progammimg/FINAL/String
$ java Task5.java
Md. Nafijur Rahaman
.
Enter a string: apple
Enter second string: banana
-1
.
20234103116
```

Task6:

```
import java.util.Scanner;

public class Task6 {

    public static void main(String[] args) {
        Scanner in = new Scanner(System.in);
        System.out.println("Md. Nafijur Rahaman\n");
        System.out.print("Enter a string: ");
        String s = in.nextLine();
        int freq[] = new int[26];
        for (int i = 0; i < s.length(); i++) {
            freq[s.charAt(i) - 'a']++;
        }
        for (int i = 0; i < s.length(); i++) {
            if (freq[s.charAt(i) - 'a'] == 1) {
                System.out.println(s.charAt(i));
                return;
            }
        }
        System.out.println("\n\n20234103116");
    }
}
```

Output:

```
HP@Tanjid MINGW64 /a/Others/2025 FALL/Adva
nce Progammimg/FINAL/String
$ java Task6.java
Md. Nafijur Rahaman

Enter a string: swiss
w
```

Task7:

```
import java.util.Scanner;

public class Task7 {

    public static void main(String[] args) {
        Scanner in = new Scanner(System.in);
        System.out.println("Md. Nafijur Rahaman\n");
        System.out.print("Enter a string: ");
        String s = in.nextLine();
        String res = "";
        for (int i = 0; i < s.length(); i++) {
            char ch = s.charAt(i);
            if (ch >= 'A' & ch <= 'Z') {
                res += (char) (ch + 32);
            } else if (ch >= 'a' & ch <= 'z') {
                res += (char) (ch - 32);
            } else {
                res += ch;
            }
        }
        System.out.println(res);
        System.out.println("\n\n20234103116");
    }
}
```

Output:

```
HP@Tanjid MINGW64 /a/Others/2025 FALL/Adva
nce Progammimg/FINAL/String
● $ java Task7.java
Md. Nafijur Rahaman

Enter a string: jaVa
JAvA

20234103116
```

Task8:

```
import java.util.Scanner;

public class Task8 {

    public static boolean isRotation(String s1, String s2) {
        if (s1.length() != s2.length())
            return false;
        return (s1 + s1).contains(s2);
    }

    public static void main(String[] args) {
        Scanner in = new Scanner(System.in);
        System.out.println("Md. Nafijur Rahaman\n");
        System.out.print("Enter a string: ");
        String s1 = in.nextLine();
        System.out.println("Enter second String: ");
        String s2 = in.nextLine();
        if (isRotation(s1, s2)) {
            System.out.println("true");
        } else {
            System.out.println("false");
        }
        System.out.println("\n\n20234103116");
    }
}
```

Output:

```
HP@Tanjid MINGW64 /a/Others/2025 FALL/Advance Programming/FINAL/String
$ java Task8.java
Md. Nafijur Rahaman

Enter a string: abcde
Enter second String:
cdeab
true

20234103116
```

Task9:

```
import java.util.Scanner;

public class Task9 {

    public static void main(String[] args) {
        Scanner in = new Scanner(System.in);
        System.out.println("Md. Nafijur Rahaman\n");
        System.out.print("Enter a string: ");
        String s = in.nextLine();
        String result = "";
        for (int i = 0; i < s.length(); i++) {
            char ch = s.charAt(i);
            if (ch == ' ') {
                result += "%20";
            } else {
                result += ch;
            }
        }
        System.out.println(result);
        System.out.println("\n\n20234103116");
    }
}
```

Output:

```
HP@Tanjid MINGW64 /a/Others/2025 FALL/Adva
nce Progammimg/FINAL/String
$ java Task9.java
Md. Nafijur Rahaman

Enter a string: Mr John Smith
Mr%20John%20Smith

20234103116
```

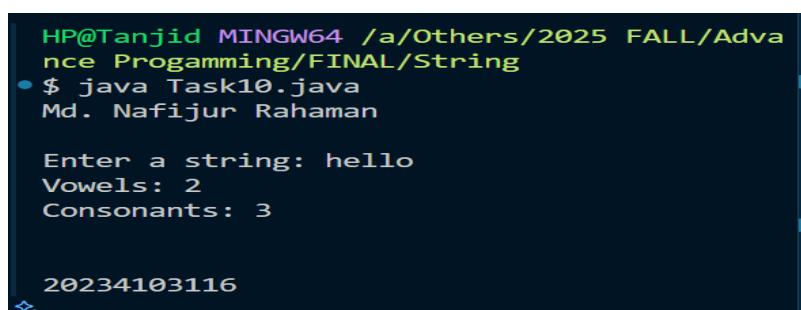
Task10:

```
import java.util.Scanner;

public class Task10 {

    public static void main(String[] args) {
        Scanner in = new Scanner(System.in);
        System.out.println("Md. Nafijur Rahaman\n");
        System.out.print("Enter a string: ");
        String s = in.nextLine().toLowerCase();
        int vow = 0;
        int cons = 0;
        for (int i = 0; i < s.length(); i++) {
            char ch = s.charAt(i);
            if (ch == 'a' | ch == 'e' | ch == 'i' | ch == 'o' | ch == 'u') {
                vow++;
            } else {
                cons++;
            }
        }
        System.out.println("Vowels: " + vow);
        System.out.println("Consonants: " + cons);
        System.out.println("\n\n20234103116");
    }
}
```

Output:



A terminal window showing the execution of a Java program named Task10. The command \$ java Task10.java is run, followed by the output "Md. Nafijur Rahaman". The user then enters the string "hello", and the program prints "Enter a string: hello", "Vowels: 2", and "Consonants: 3". Finally, the string "20234103116" is printed at the bottom.

```
HP@Tanjid MINGW64 /a/Others/2025 FALL/Advance Programming/FINAL/String
$ java Task10.java
Md. Nafijur Rahaman

Enter a string: hello
Vowels: 2
Consonants: 3

20234103116
```

Task11:

```
import java.util.Scanner;

public class Task11 {

    public static String longestCommonPrefix(String[] arr) {
        if (arr.length == 0)
            return "";
        String prefix = arr[0];
        for (int i = 0; i < arr.length; i++) {
            while (arr[i].indexOf(prefix) != 0) {
                prefix = prefix.substring(0, prefix.length() - 1);
                if (prefix.isEmpty())
                    return "";
            }
        }
        return prefix;
    }

    public static void main(String[] args) {
        Scanner in = new Scanner(System.in);
        System.out.print("Enter number of strings: ");
        int n = in.nextInt();
        in.nextLine();
        String[] arr = new String[n];
        System.out.println("Enter strings:");
        for (int i = 0; i < n; i++) {
            arr[i] = in.nextLine();
        }
    }
}
```

```

String prefix = longestCommonPrefix(arr);

System.out.println("Longest Common Prefix: " + prefix);

}

}

```

Output:

```

HP@Tanjid MINGW64 /a/Others/2025 FALL/Adva
nce Progammimg/FINAL/String
$ java Task11.java
Enter number of strings: 3
Enter strings:
flower
flow
flight
Longest Common Prefix: fl

```

Task12:

```

import java.util.Scanner;

public class Task12 {

    public static int smallestUniqueSubstring(String s) {

        boolean[] seen = new boolean[256];

        int totalUnique = 0;

        for (int i = 0; i < s.length(); i++) {

            if (!seen[s.charAt(i)]) {

                seen[s.charAt(i)] = true;

                totalUnique++;

            }

        }

        int minLen = s.length();

        for (int i = 0; i < s.length(); i++) {

            boolean[] window = new boolean[256];

            int count = 0;

            for (int j = i; j < s.length(); j++) {

```

```

char ch = s.charAt(j);

if (!window[ch]) {

    window[ch] = true;

    count++;

}

if (count == totalUnique) {

    minLen = Math.min(minLen, j - i + 1);

    break;

}

}

}

return minLen;
}

public static void main(String[] args) {

Scanner in = new Scanner(System.in);

System.out.println("Md. Nafijur Rahaman\n");

System.out.print("Enter a string: ");

String s = in.nextLine();

System.out.println("Length of smallest substring: " + smallestUniqueSubstring(s));

System.out.println("\n\n20234103116");

}
}

```

Output:

```

HP@Tanjid MINGW64 /a/Others/2025 FALL/Adva
nce Progammimg/FINAL/String
$ java Task12.java
Md. Nafijur Rahaman

Enter a string: aabcbcdcba
Length of smallest substring: 4

20234103116
>

```

Task13:

```
import java.util.Scanner;

public class Task13 {

    public static String Replace(String s, String oldStr, String newStr) {
        StringBuilder sb = new StringBuilder();
        int i = 0;
        while (i <= s.length() - oldStr.length()) {
            if (s.substring(i, i + oldStr.length()).equals(oldStr)) {
                sb.append(newStr);
                i += oldStr.length();
            } else {
                sb.append(s.charAt(i));
                i++;
            }
        }
        while (i < s.length()) {
            sb.append(s.charAt(i));
            i++;
        }
        return sb.toString();
    }

    public static void main(String[] args) {
        Scanner in = new Scanner(System.in);
        System.out.println("Md. Nafijur Rahaman\n");
        System.out.print("Enter a string: ");
        String s = in.nextLine();
    }
}
```

```

System.out.print("Enter string to replace: ");

String oldStr = in.nextLine();

System.out.print("Enter new string: ");

String newStr = in.nextLine();

String result = Replace(s, oldStr, newStr);

System.out.println(result);

System.out.println("\n\n20234103116");

}
}

```

Output:

```

HP@Tanjid MINGW64 /a/Others/2025 FALL/Advance Programming/FINAL/String
$ java Task13.java
Md. Nafijur Rahaman

Enter a string: java is fun
Enter string to replace: fun
Enter new string: powerfull
java is powerfull

20234103116

```

Task14:

```

import java.util.Scanner;

public class Task14 {

    public static String longestPalindrome(String s) {

        String longest = "";

        for (int i = 0; i < s.length(); i++) {

            for (int j = i; j < s.length(); j++) {

                String sub = s.substring(i, j + 1);

                if (isPalindrome(sub) && sub.length() > longest.length()) {

                    longest = sub;
                }
            }
        }
    }
}

```

```

}

return longest;
}

public static boolean isPalindrome(String str) {

int left = 0, right = str.length() - 1;

while (left < right) {

if (str.charAt(left) != str.charAt(right))

return false;

left++;

right--;

}

return true;
}

public static void main(String[] args) {

Scanner in = new Scanner(System.in);

System.out.println("Md. Nafijur Rahaman\n");

System.out.print("Enter a string: ");

String s = in.nextLine();

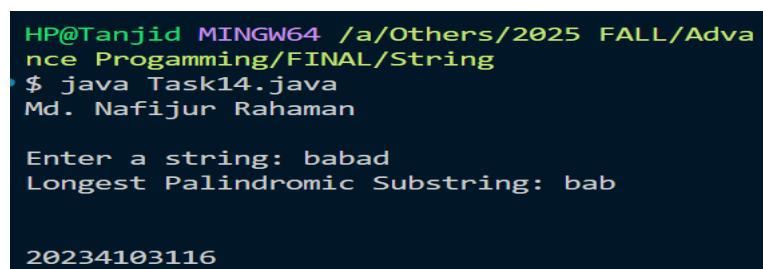
System.out.println("Longest Palindromic Substring: " + longestPalindrome(s));

System.out.println("\n\n20234103116");

}
}

```

Output:



```

HP@Tanjid MINGW64 /a/Others/2025 FALL/Adva
nse Progammimg/FINAL/String
$ java Task14.java
Md. Nafijur Rahaman

Enter a string: babad
Longest Palindromic Substring: bab

20234103116

```

Task15:

```
import java.util.Scanner;

public class Task15 {

    public static int minInsertions(String s, int i, int j) {

        if (i >= j)
            return 0;

        if (s.charAt(i) == s.charAt(j)) {
            return minInsertions(s, i + 1, j - 1);
        } else {
            return 1 + Math.min(
                minInsertions(s, i + 1, j),
                minInsertions(s, i, j - 1));
        }
    }

    public static void main(String[] args) {
        Scanner in = new Scanner(System.in);
        System.out.println("Md. Nafijur Rahaman\n");
        System.out.print("Enter a string: ");
        String s = in.nextLine();
        System.out.println("Minimum insertions: " + minInsertions(s, 0, s.length() - 1));
        System.out.println("\n\n20234103116");
    }
}
```

Output:

```
HP@Tanjid MINGW64 /a/Others/2025 FALL/Advance Progammimg/FINAL/String
$ java Task15.java
Md. Nafijur Rahaman

Enter a string: abcd
Minimum insertions: 2

20234103116
```

Task16:

```
import java.util.Scanner;

public class Task16 {

    public static String compress(String s) {
        if (s.length() == 0)
            return "";
        StringBuilder sb = new StringBuilder();
        int count = 1;
        for (int i = 1; i < s.length(); i++) {
            if (s.charAt(i) == s.charAt(i - 1)) {
                count++;
            } else {
                sb.append(s.charAt(i - 1)).append(count);
                count = 1;
            }
        }
        sb.append(s.charAt(s.length() - 1)).append(count);
        return sb.toString();
    }

    public static void main(String[] args) {
        Scanner in = new Scanner(System.in);
        System.out.println("Md. Nafijur Rahaman\n");
        System.out.print("Enter a string: ");
        String s = in.nextLine();
        String result = compress(s);
        System.out.println(result);
    }
}
```

```
System.out.println("\n\n20234103116");
}
}
```

Output:

```
HP@Tanjid MINGW64 /a/Others/2025 FALL/Adva
nce Progammimg/FINAL/String
$ java Task16.java
Md. Nafijur Rahaman

Enter a string: aaabbc
a3b2c1

20234103116
```

Task17:

```
import java.util.Scanner;

public class Task17 {

    public static String decompress(String s) {
        StringBuilder sb = new StringBuilder();
        int i = 0;
        while (i < s.length()) {
            char ch = s.charAt(i++);
            int count = 0;
            while (i < s.length() && Character.isDigit(s.charAt(i))) {
                count = count * 10 + (s.charAt(i) - '0');
                i++;
            }
            for (int j = 0; j < count; j++) {
                sb.append(ch);
            }
        }
        return sb.toString();
    }
}
```

```
}

public static void main(String[] args) {

Scanner in = new Scanner(System.in);

System.out.println("Md. Nafijur Rahaman\n");

System.out.print("Enter compressed string: ");

String s = in.nextLine();

String result = decompress(s);

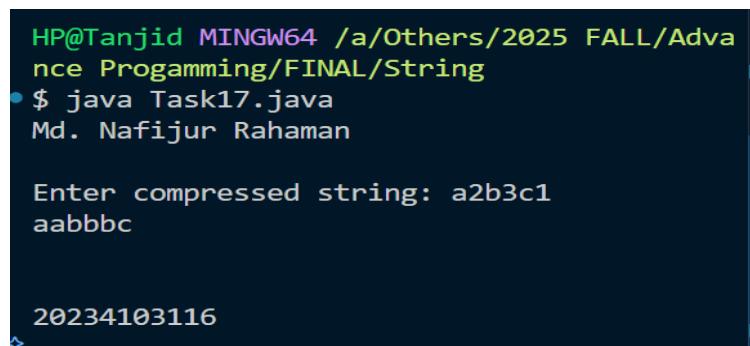
System.out.println(result);

System.out.println("\n\n20234103116");

}

}
```

Output:



A screenshot of a terminal window titled "HP@Tanjid MINGW64 /a/Others/2025 FALL/Advance Progammimg/FINAL/String". It shows the execution of a Java program named "Task17.java". The output includes the user's name "Md. Nafijur Rahaman", the prompt "Enter compressed string:", the input "a2b3c1aabbbc", and the final output "20234103116".

```
HP@Tanjid MINGW64 /a/Others/2025 FALL/Advance Progammimg/FINAL/String
$ java Task17.java
Md. Nafijur Rahaman

Enter compressed string: a2b3c1aabbbc

20234103116
```