Practical No.4

Title : Implement a program to calculate precision and recall for sample input. (Answer set A, Query 91, Relevant documents to query ql- R q l)

Program:

```
import java.io.*;


public class RecallPrecisionEvaluation {


   public static String left(String s, int w) {
      StringBuilder sb = new StringBuilder(s);
      int padding = w - s.length();
      for (int i = 0; i < padding; i++) {
         sb.append(" ");
      }
      return sb.toString() + "|";
   }


   public static String center(String s, int w) {
      StringBuilder sb = new StringBuilder();
      int padding = w - s.length();
      int leftPadding = padding / 2;
      for (int i = 0; i < leftPadding; i++) {
         sb.append(" ");
      }
      sb.append(s);
      for (int i = 0; i < padding - leftPadding; i++) {
         sb.append(" ");
```

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    }
    return sb.toString();
}

public static String prd(float x, int decDigits, int width) {
    String format = "% " + width + "." + decDigits + "f";
    return String.format(format, x);
}

public static String printDocs(String[] state, int size) {
    StringBuilder sb = new StringBuilder("| ");
    for (int i = 0; i < size; i++) {
        if (state[i] != null) {
            sb.append(state[i]);
            if (i + 1 < size && state[i + 1] != null && !state[i + 1].isEmpty()) {
                sb.append(", ");
            }
        }
    }
    return left(sb.toString(), 98);
}

public static float E_value(float b, float rj, float pj) {
    return 1 - ((1 + b * b) * rj * pj) / (b * b * pj + rj);
}

public static void main(String[] args) {
    String[] Rq = {"d3", "d5", "d9", "d25", "d39", "d44", "d56", "d71", "d89", "d123"};
```

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String[] A = {"d123", "d84", "d56", "d6", "d8", "d9", "d51", "d129", "d187", "d25", "d38", "d48", "d250", "d113", "d3"};


try (BufferedWriter write = new BufferedWriter(new FileWriter("Recall_Precision_Evaluation_output.txt"))) {
    float modRq = Rq.length;
    String[] Ra = new String[A.length];
    float[] P = new float[A.length];
    float[] R = new float[A.length];
    float modRa = 0;
    float modA = 0;
    float precision;
    float recall;


    System.out.printf("%s%n", "-".repeat(146));
    write.write("-".repeat(146) + "\n");
    System.out.printf("|%s|%s|%s|%s|%s|%n", center("Documents", 96), center("|Ra|", 8), center("|A|", 8), center("Precision(%)", 13), center("Recall(%)", 13));
    write.write(String.format("|%s|%s|%s|%s|%s|%n", center("Documents", 96), center("|Ra|", 8), center("|A|", 8), center("Precision(%)", 13), center("Recall(%)", 13)));
    System.out.printf("%s%n", "-".repeat(146));
    write.write("-".repeat(146) + "\n");


    for (int i = 0; i < A.length; i++) {
       Ra[i] = A[i];
       modA++;
       for (String r : Rq) {
          if (A[i].equals(r)) {
             modRa++;
             break;
```

```
            }
        }
        precision = (modRa / modA) * 100;
        P[i] = precision / 100;
        recall = (modRa / modRq) * 100;
        R[i] = recall / 100;

        System.out.print(printDocs(Ra, Ra.length));
        write.write(printDocs(Ra, Ra.length));
        System.out.printf("%s|%s|%s|%s|%n", prd(modRa, 2, 10), prd(modA, 2, 10), prd(precision, 2, 13), prd(recall, 2, 10));
        write.write(String.format("%s|%s|%s|%s|%n", prd(modRa, 2, 10), prd(modA, 2, 10), prd(precision, 2, 13), prd(recall, 2, 10)));
    }

    System.out.printf("%s%n", "-".repeat(146));
    write.write("-".repeat(146) + "\n");

    int j;
    do {
        System.out.printf("Harmonic mean and E-value\nEnter value of j(0 - %d) to find F(j) and E(j):%n", A.length - 1);
        BufferedReader reader = new BufferedReader(new InputStreamReader(System.in));
        j = Integer.parseInt(reader.readLine());
    } while (j < 0 || j >= Ra.length);

    float Fj = 2 * (P[j] * R[j]) / (P[j] + R[j]);
    System.out.printf("%s%n| Harmonic mean (F%d) is: %.2f|%n%s%n", "-".repeat(38), j, Fj, "-".repeat(38));
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            write.write(String.format("%s%n| Harmonic mean (F%d) is: %.2f|%n%s%n", "-".repeat(38), j, Fj, "-".repeat(38)));


            System.out.printf("%s%n|%s", "-".repeat(38), center("E-Value", 32));

            System.out.printf("%s%n", "-".repeat(38));

            write.write(String.format("%s%n|%s", "-".repeat(38), center("E-Value", 32)));

            write.write(String.format("%s%n", "-".repeat(38)));


            System.out.printf("|%s|%s|%s|%n", center("b>1", 10), center("b=0", 10), center("b<1", 10));

            System.out.printf("%s%n", "-".repeat(38));

            write.write(String.format("|%s|%s|%s|%n", center("b>1", 10), center("b=0", 10), center("b<1", 10)));

            write.write("-".repeat(38) + "\n");


            System.out.printf("|%s|%s|%s|%n", prd(E_value(1.1f, R[j], P[j]), 2, 10), prd(E_value(0, R[j], P[j]), 2, 10), prd(E_value(0.9f, R[j], P[j]), 2, 10));

            write.write(String.format("|%s|%s|%s|%n", prd(E_value(1.1f, R[j], P[j]), 2, 10), prd(E_value(0, R[j], P[j]), 2, 10), prd(E_value(0.9f, R[j], P[j]), 2, 10)));


            System.out.printf("%s%n", "-".repeat(38));

            write.write("-".repeat(38) + "\n");

        } catch (IOException e) {

            System.err.println("Error writing to file: " + e.getMessage());

        } catch (NumberFormatException e) {

            System.err.println("Invalid input. Please enter a valid number.");

        }

    }

}
```
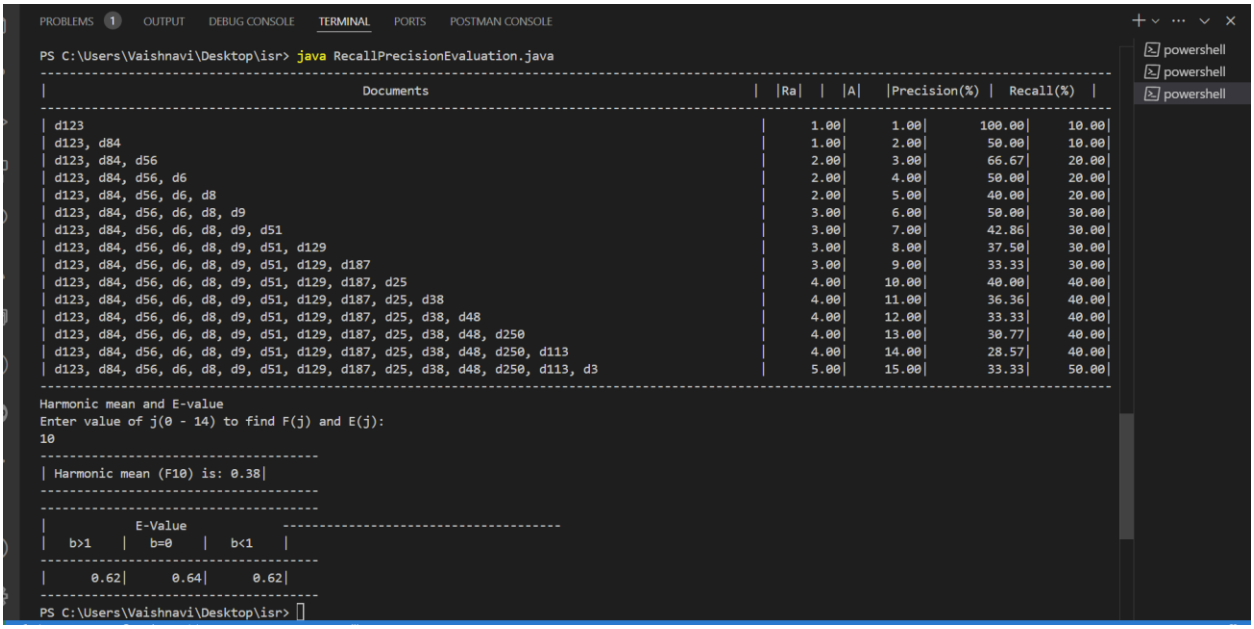

OUTPUT :


PROBLEMS 1
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS
POSTMAN CONSOLE
powershell
powershell
powershell
PS C:\Users\Vaishnavi\Desktop\isr> java RecallPrecisionEvaluation.java
Documents		Ra			A		Precision(%)	Recall(%)
d123	1.00	1.00	100.00	10.00
d123, d84	1.00	2.00	50.00	10.00
d123, d84, d56	2.00	3.00	66.67	20.00
d123, d84, d56, d6	2.00	4.00	50.00	20.00
d123, d84, d56, d6, d8	2.00	5.00	40.00	20.00
d123, d84, d56, d6, d8, d9	3.00	6.00	50.00	30.00
d123, d84, d56, d6, d8, d9, d51	3.00	7.00	42.86	30.00
d123, d84, d56, d6, d8, d9, d51, d129	3.00	8.00	37.50	30.00
d123, d84, d56, d6, d8, d9, d51, d129, d187	3.00	9.00	33.33	30.00
d123, d84, d56, d6, d8, d9, d51, d129, d187, d25	4.00	10.00	40.00	40.00
d123, d84, d56, d6, d8, d9, d51, d129, d187, d25, d38	4.00	11.00	36.36	40.00
d123, d84, d56, d6, d8, d9, d51, d129, d187, d25, d38, d48	4.00	12.00	33.33	40.00
d123, d84, d56, d6, d8, d9, d51, d129, d187, d25, d38, d48, d250	4.00	13.00	30.77	40.00
d123, d84, d56, d6, d8, d9, d51, d129, d187, d25, d38, d48, d250, d113	4.00	14.00	28.57	40.00
d123, d84, d56, d6, d8, d9, d51, d129, d187, d25, d38, d48, d250, d113, d3	5.00	15.00	33.33	50.00
Harmonic mean and E-value
Enter value of j(0 - 14) to find F(j) and E(j):
10
Harmonic mean (F10) is: 0.38
E-Value
b>1	b=0	b<1
0.62	0.64	0.62
PS C:\Users\Vaishnavi\Desktop\isr>