Institute Of Technology, Nirma university

BRANCH :- **Computer Science Engineering**

PRACTICAL SUBMISSION

|*|*STUDENT INFO*|*|

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Division :- **E4**

|*|*SUBJECT INFO*|*|

Subject :- **Advanced Data Structures**

Practical No. :- **9**

Practical – 9

AIM :- Suffix arrays are preprocessed structure that can be used to solve the classical substring matching problem. Implement suffix arrays for a long string sequence and demonstrate the matching operation.

Code:

SuffixArray.java

```java
import java.util.Scanner;

public class SuffixArray {
    private String[] text;
    private int length;
    private int[] index;
    private String[] suffix;

    public SuffixArray(String text) {
        this.text = new String[text.length()];

        for (int i = 0; i < text.length(); i++) {
            this.text[i] = text.substring(i, i + 1);
        }

        this.length = text.length();
        this.index = new int[length];
        for (int i = 0; i < length; i++) {
            index[i] = i;
        }

        suffix = new String[length];
    }

    public void createSuffixArray() {
        for (int index = 0; index < length; index++) {
            String text = "";
            for (int text_index = index; text_index < length; text_index++) {
                text += this.text[text_index];
            }
            suffix[index] = text;
        }

        int back;
        for (int iteration = 1; iteration < length; iteration++) {
            String key = suffix[iteration];
            int keyindex = index[iteration];

            for (back = iteration - 1; back >= 0; back--) {
                if (suffix[back].compareTo(key) > 0) {
                    suffix[back + 1] = suffix[back];
                    index[back + 1] = index[back];
                } else {
```

```java
                break;
            }
        }
        suffix[back + 1] = key;
        index[back + 1] = keyindex;
    }

    System.out.println("SUFFIX \t INDEX");
    for (int iterate = 0; iterate < length; iterate++) {
        System.out.println(suffix[iterate] + "\t" + index[iterate]);
    }
}

public static void main(String... arg) {
    String text = "";
    Scanner sc = new Scanner(System.in);
    System.out.println("Enter the Text String ");
    text = sc.nextLine();

    SuffixArray suffixarray = new SuffixArray(text);
    suffixarray.createSuffixArray();
}
}
```

```
Enter the Text String
Hello
SUFFIX    INDEX
Hello    0
ello     1
llo      2
lo       3
o        4
```

```
Enter the Text String
balloon
SUFFIX    INDEX
alloon   1
balloon  0
lloon    2
loon     3
n        6
on       5
oon      4
```

```
Enter the Text String
banana
SUFFIX    INDEX
a        5
ana      3
anana    1
banana   0
na       4
nana     2
```