**Assignment 7**

**Objective:**

Construct a Sensor Machine which counts the occurrence of 'babb' in the given string.

**Code:**

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace ToCS\_Assignment\_7

{

class Program

{

//This Function prints the Transition Table

public static void printTransitionTable(int[,] arr)

{

Console.WriteLine();

Console.WriteLine("State | 0 1 Output ");

for (int r = 0; r < arr.GetLength(0); r++)

{

Console.Write("q" + r + " |");

for (int c = 0; c < arr.GetLength(1); c++)

{

if (c < 2)

Console.Write(" q" + arr[r, c] + " ");

else

Console.Write(" " + arr[r, c] + " ");

}

Console.WriteLine();

}

Console.WriteLine();

}

static void Main(string[] args)

{

int column, i, r, nextState, count=0;

string str, chr;

int[,] transitionTable = new int[5,3]; //Initialize the matrix of 5 by 3

{

//Column 0 entries

transitionTable[0, 0] = 0; //This block of code fills the martx/Transition

transitionTable[1, 0] = 2; //Table with the values of Moore Machine which

transitionTable[2, 0] = 0; //counts the occurance of babb

transitionTable[3, 0] = 2;

transitionTable[4, 0] = 0;

//Column 1 entries

transitionTable[0, 1] = 1;

transitionTable[1, 1] = 1;

transitionTable[2, 1] = 3;

transitionTable[3, 1] = 4;

transitionTable[4, 1] = 1;

//Column 2 entries (Output)

transitionTable[0, 2] = 0;

transitionTable[1, 2] = 0;

transitionTable[2, 2] = 0;

transitionTable[3, 2] = 0;

transitionTable[4, 2] = 1;

}

printTransitionTable(transitionTable); //This prints the Transition Table

while (true)

{

Console.Write("\nEnter String : ");

str = Console.ReadLine();

r = 0; i = 0; count = 0; //Make all variable 0 before after entering a string

while (i < str.Length) //This Loop traverse the Nodes/Transition Table and

{ //reaches the end of the string

chr = Convert.ToString(str[i]);//chr contains the i'th character of string

if (chr == "a") //Here 'a' means we need to see in column 0

column = 0;

else

column = 1;

//element of (r,i'th character) moves the machine to nextState

nextState = transitionTable[r, column];

r = nextState; //r contains the row number of next state

i++;

if (transitionTable[r, 2] == 1) //This counts the occurance of babb, if

count++;

}

Console.WriteLine();

Console.WriteLine("Output : " + count); //Here we see the output of (r,2)

Console.ReadKey();

}

}

}

}



