**Assignment 6**

**Objective:**

Construct a Moore Machine which accepts(Deccimal equivalent Binary) mod m, where 'm' is input by user.

**Code:**

using System;

usingSystem.Collections.Generic;

usingSystem.Linq;

usingSystem.Text;

usingSystem.Threading.Tasks;

namespace ToCS\_Assignment\_6

{

classProgram

{

//This function returns the row number(i.e if str=a, it returns 0 and if str=c it returns 2)

publicstaticintreturnRowNumber(string str)

{

int c = 0;

while ((char)(97 + c) != (char)str[0])

c++;

return c;

}

//This Function prints the Transition Table

publicstaticvoidprintTransitionTable(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();

}

//This generate the Transition Table for more machine

publicstaticint[,] generateTransitionTable(int states)

{

int[,] transitionTable = newint[states, 3];

int fill = 0;

for(inti = 0; i< states; i++)

{

for(int j = 0; j < 2; j++)

{

transitionTable[i, j] = fill;

fill++;

if (fill == states)

fill = 0;

}

transitionTable[i, 2] = i;

}

returntransitionTable;

}

staticvoid Main(string[] args)

{

intnoOfStates, anyNumber, i = 0, r = 0, nextState;

string str, chr ;

Console.Write("Enter value of divisor : ");

noOfStates = Convert.ToInt32(Console.ReadLine()); //Input divisor(number of States)

Console.WriteLine("States are q0,q1,q2,......\n");

//Initialize the matrix of noOfStates by 3 and fill it

int[,] transitionTable = generateTransitionTable(noOfStates);

printTransitionTable(transitionTable); //To print the Transition table

while (true)

{

r = 0;

Console.Write("\nEnter any Number : ");

anyNumber = Convert.ToInt32(Console.ReadLine()); //Input Number to denomenator

str = Convert.ToString(anyNumber, 2); //Input number in binary(string)

i = 0;

//This Loop traverse the Nodes/Transition Table and reaches the end of the string

while (i<str.Length)

{

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

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

nextState = transitionTable[r, Convert.ToInt32(chr)];

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

i++;

}

Console.WriteLine();

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

Console.ReadKey();

}

}

}

}



