

**LAB # 8**

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CC- [Lab]

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**Q: Design a deterministic finite automaton which will accept variables of C.**

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace Lab8\_DFA

{

internal class Program

{

static void Main(string[] args)

{

// Define DFA components

HashSet<string> states = new HashSet<string> { "q0", "q1", "q2", "q3" }; // States

string startState = "q0"; // Start state

HashSet<string> finalStates = new HashSet<string> { "q3" }; // Final state

// Define transitions

Dictionary<(string, char), string> transitions = new Dictionary<(string, char), string>

{

{ ("q0", 'a'), "q1" },

{ ("q0", 'b'), "q2" },

{ ("q1", 'c'), "q3" },

{ ("q2", 'd'), "q3" }

};

while (true)

{

Console.WriteLine("Enter input string (e.g., ac, bd). Type 'exit' to quit:");

string input = Console.ReadLine();

// Check if the user wants to exit

if (input.ToLower() == "exit")

{

Console.WriteLine("Exiting the program...");

break;

}

// Process input using DFA

string currentState = startState;

bool isAccepted = true;

foreach (char symbol in input)

{

if (transitions.ContainsKey((currentState, symbol)))

{

currentState = transitions[(currentState, symbol)];

}

else

{

Console.WriteLine("Rejected: Invalid transition.");

isAccepted = false;

break;

}

}

if (isAccepted && finalStates.Contains(currentState))

{

Console.WriteLine("Accepted: Input matches the grammar.");

}

else if (isAccepted)

{

Console.WriteLine("Rejected: Did not reach a final state.");

}

}

}

}

}

**Output:**

