

CST4L: CS PROFESSIONAL TRACK

CODE: 4383 BS COMPUTER SCIENCE PS204

LabActivity1_DFA:

```
package LabActivity;

import java.util.Scanner;

public class LabActivity1_DFA {

    private enum State {
        q0, q1, q2
    }

    public static void main(String[] args) {
        Scanner scan = new Scanner(System.in);

        while (true) {
            System.out.println("\n---DFA String Acceptance Checker---");
            System.out.println("Enter a sample binary strings (or type 'exit' to quit): ");
            String input = scan.nextLine();

            if (input.equalsIgnoreCase("exit")) {
                System.out.println("Program terminated.");
                break;
            }

            if (!isValidBinaryString(input)) {
                System.out.println("Error: Invalid input!");
                continue;
            }

            boolean accepted = simulateDFA(input);
            System.out.println("\nOutput: " + (accepted ? "Accepted" : "Rejected"));
        }
        scan.close();
    }

    private static boolean isValidBinaryString(String input) {
        if ((input == null) || input.isEmpty()) {
            return false;
        }
        return input.matches("[01]+");
    }

    private static boolean simulateDFA(String input) {
        State currentState = State.q0;
```

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```
for(int i = 0; i < input.length(); i++){
    char symbol = input.charAt(i);
    State previousState = currentState;

    currentState = transition(currentState, symbol);
}
return currentState == State.q2;
}
private static State transition(State current, char symbol){
    switch (current){
        case q0, q2:
            if (symbol == '0'){
                return State.q1;
            }else{
                return State.q0;
            }
        case q1:
            if (symbol == '0'){
                return State.q1;
            }else {
                return State.q2;
            }
        default:
            return State.q0;
    }
}
}
```

OUTPUT:

```
C:\Users\User\.jdk\openjdk-23.0.2\bin\java.exe "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2024.3\lib\idea_rt.jar=6020:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2024.3\bin" -jar C:\Users\User\IdeaProjects\CST4L_LabProjects\LabActivity1_DFA.jar
---DFA String Acceptance Checker---
Enter a sample binary strings (or type 'exit' to quit):
0011
Output: Rejected

---DFA String Acceptance Checker---
Enter a sample binary strings (or type 'exit' to quit):
1101
Output: Accepted

---DFA String Acceptance Checker---
Enter a sample binary strings (or type 'exit' to quit):
1010
Output: Rejected

---DFA String Acceptance Checker---
Enter a sample binary strings (or type 'exit' to quit):
0101
Output: Accepted
```

