

**Birla Institute of Technology and Science-Pilani, Hyderabad Campus**  
**II Semester 2023-2024**  
**CS F363 Compiler Construction**  
**Lab 1**

**Problem 1** Write a C / C++ program to check the given input string  $w \in \{0,1\}^*$  is accepted by the given DFA.

**Input format:** A .txt file with several lines as follows

```
5 //number of states and the default state numbers start with 0,i.e., 0, 1, 2, 3, 4 are
  the state lables and 0 is the start state
2 4 //The list of final states
0 1 3 // state no. = 0 and delta(0,0)=1 and delta(0,1) =2
1 3 4 // state is 1 and delta(0,0)=1 and delta(0,1) =2
..
...
0110101 //input string
```

**Problem 2** Write a C / C++ program to check the given input string  $w \in \{0,1\}^*$  is accepted by the given NFA.

**Input format:** A .txt file with several lines as follows

```
5 //number of states and the default state numbers start with 0,i.e., 0, 1, 2, 3, 4 are
  the state lables and 0 is the start state
2 4 //The list of final states
0 {1, 4} {3} // state no. = 0 and delta(0,0)={1,4} and delta(0,1) ={3}
1 { } {4, 5} // state is 1 and delta(1,0) is not defined and delta(1,1) ={4,5}
..
...
0110101 //input string
```

**Problem 3** Write a C / C++ program to convert the given NFA to an equivalent DFA.

Input format is the same as problem 2 and the output format is also similar to this but first print the transition function then print the list of final states.

**Problem 4 (Homework)** Write a C / C++ program to Convert the given NFA with  $\epsilon$ -transitions to an equivalent DFA.

**Input format:** A .txt file with several lines as follows

```
5 //number of states and the default state numbers start with 0,i.e., 0, 1, 2, 3, 4 are
  the state lables and 0 is the start state
2 4 //The list of final states
0 {1,4} {3} {2} // state no= 0 and delta(0,0)={1,4}, delta(0,1) ={3},
                  and delta(0,epsilon) = {2}
1 { } {4, 5} {4} // state is 1 and delta(1,0) is not defined, delta(1,1) ={4,5},
                  and delta(1,epsilon) ={4}
..
...
```

Output format is the same as problem 3.