

Course- BTech
Course Code- CSET302
Year- Third

Type- Core
Course Name- Automata Theory & Computability
Semester- Odd Batch- BTech 5th Semester

Tutorial-2

Tutorial No.	Name	CO1	CO2	CO3	CO4
2	DFA	3	--	--	

Objective: Construction of a DFA and generation of strings.

Construct a DFA for:

1. $\Sigma = \{a, b\}$, where every 'a' is followed by 'b'. (CO1)
2. $\Sigma = \{0, 1\}$, which contains 00 as a substring. (CO1)
3. $\Sigma = \{0, 1\}$, which contains 101 as a substring. (CO1)
4. $\Sigma = \{a, b\}$ where every a is followed by bb. (CO1)
5. $\Sigma = \{a, b\}$ where every a is not followed by bb. (CO1)
6. $\Sigma = \{a, b\}$ which accepts the language $L = \{a^n b^m | n, m \geq 1\}$. (CO1)
7. $\Sigma = \{a, b, c\}$ which accepts the language $L = \{a^n b^m c^l | n, m, l \geq 1\}$. (CO1)
8. $\Sigma = \{a, b\}$ which accepts the language $L = \{a^n b^m | n, m > 0, n = m\}$. (CO1)
9. $\Sigma = \{0, 1\}$, which contains at least two consecutive 0's. (CO1)
10. $\Sigma = \{a, b\}$ which contains even number of a's and even number of b's. (CO1)
11. $\Sigma = \{a, b\}$ which contains even number of a's and odd number of b's. (CO1)
12. $\Sigma = \{a, b\}$ which contains odd number of a's and even number of b's. (CO1)
13. $\Sigma = \{a, b\}$ which contains odd number of a's and odd number of b's. (CO1)

- Construct a DFA accepting all strings w over $\{0, 1\}$ such that the number of 1's in w is 3 mod 4. (CO1)

- Construct a transition system which can accept strings over the alphabet
15. a, b, \dots containing either *cat* or *rat*. (CO1)

Generate the string for :

16. $L = \{w \in \{0,1\}^* \mid w \text{ has an even number of 0's}\}$ (CO1)
17. $L = \{w \in \{a,b\}^* \mid \text{every 'a' is immediately followed by a 'b'}\}$ (CO1)
18. $L = \{w \in \{0,1\}^* \mid w \text{ has more 1's than 0's}\}$ (CO1)