# TOC

## THEORY OF COMPUTATION

⭐ **INTRODUCTION** :-> Theory of Computation (TOC) is a branch of computer science that studies how problems can be solved using algorithms, how efficiently they can be solved, and which problems cannot be solved by any computer.

It's basically about mathematical models of computation and understanding the limits of computing.

- ➔ What can a computer do? (Computability).
- ➔ How can it be done? (Models like DFA, NDFA, and TURING MACHINE).
- ➔ How efficiently can it be done? (Complexity).

Example-1. Speech Recognition (Automata and Computational theory use).

Example-2. Traffic Light Control Systems (Used Finite Automata for controlling the traffic light signal in different States.)