**MARCO M. ALIMURUNG**

**BSCS – 3C**

* **Finite Automata(FA)** Finite automata, also known as abstract machines, are tools used to find patterns or sequences in input data. They’re commonly used in various applications, such as analyzing language in compilers and searching text in search engines. These machines have a set number of states they can be in.
* **Deterministic finite automata (or DFA)** A deterministic finite automaton (DFA) is a type of finite automaton where each state has exactly one transition for every possible input symbol. This means that, given a specific state and input symbol, the DFA always moves to the same next state. The DFA can only be in a set number of states. An input string is considered accepted if, after processing all its symbols, the DFA ends up in a special state called the "accepting" or "final" state.
* **Parts of a Deterministic Finite Automaton (DFA) consist of:**
* **States (Q):** A finite automaton has a limited number of states it can be in. Among these, one state is chosen as the starting state, and some states are marked as accepting (or final) states. The DFA moves between these states according to the input symbols it processes.
* **Alphabet (Σ):** A DFA uses a finite set of symbols, known as the alphabet, as input. Each symbol in this alphabet causes the DFA to transition from one state to another.
* **Transition Function (δ):** A DFA has a function that determines how it moves between states. This function, called δ, takes a current state and an input symbol and returns the next state. Formally, it’s written as δ: Q × Σ → Q. For every combination of state and input symbol, the DFA always moves to exactly one specific next state.
* **Initial State (q₀):** The starting state is the state where the DFA begins processing the input. It is part of the set of states (Q) and serves as the initial point for the computation.
* **Accepting (or Final) States (F):** A subset of states in Q shows whether the DFA accepts the input string. If the DFA finishes in one of these states after processing the input, the string is accepted by the DFA.
* Simple DFA

