Theory of Automata → কাজকাম কাকে সাজাতে

7, 2, 6, 9, 10

output = 3

7-(10//9)+(6÷2) ← এভাবেও

7-18 7-4

= 3

Automata theory is branch of theory of computation that deals with abstract machines and their capacities of computation.

Abstract machines mean automata that perform computation on string of symbols according to the rules.

Grammer in ToC :

Grammer is a formal system that defines a set of rules for generating valid string within the language

Σ elements

⇒ Terminal component (Small letters a, b, c..)

⇒ Non-terminal Component (Capital letter A, B, C..)

A grammer is represented by 4-Tuples

$G = \{N, T, P, S\}$

N = Finite numbers of Non terminals } তার impact এর তত্ত্ব assist করে

T = Finite number of terminals →

P = Production rules → Non terminal কে terminal ও Non terminal এ রূপান্তর করতে পারবে।

S = Start

Such as

$N = \{A\}$

$T = \{a, b\}$

$P = \{A \to Aa, A \to Ab, A \to Ac, A \to \epsilon\}$

$S = \{A\}$

abc

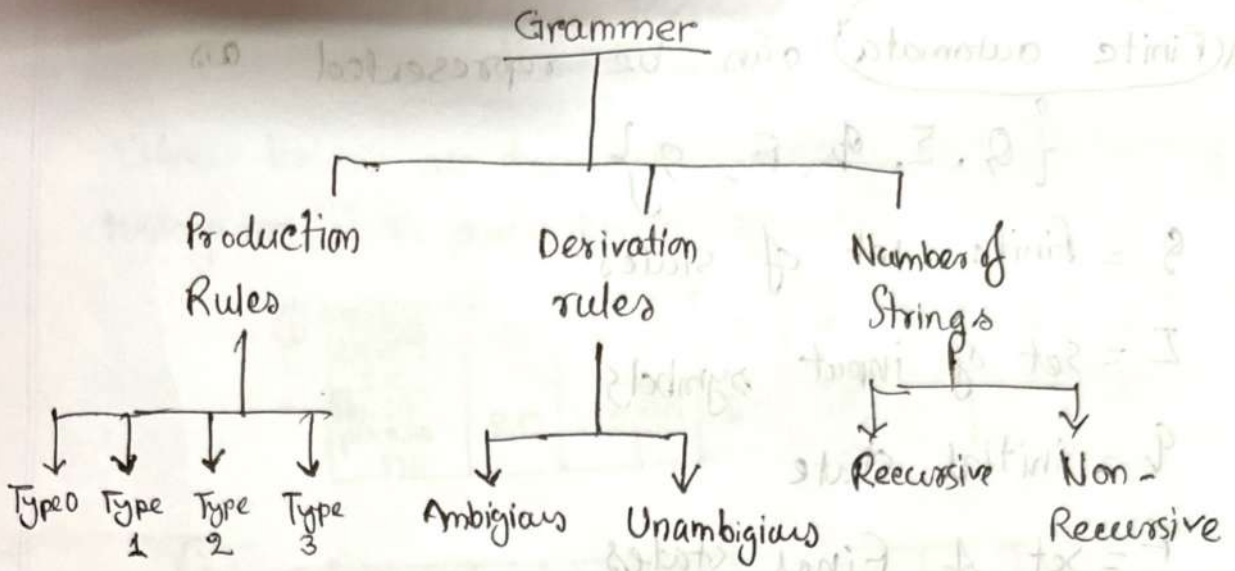
$S \to A$

$\to Ac$

$\to Abc$

$\to Aabc$

$\to abc$



Chomsky hierochy

Type 0 ⟶ Unrestricted

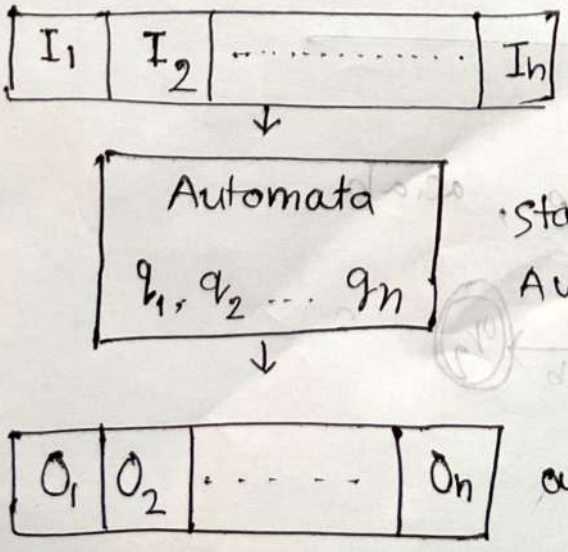
Type 1 ⟶ Context-sensitive

Type 2 ⟶ context-free

Type 3 ⟶ Regular

Finite Automata

recognize patterns in inputs



Characteristics

consist of states, transitions and input symbols, preparing each symbol step by step. It ends in an accepting state after processing all inputs.

the input is accepted otherwise rejected

2 types

⇒ Deterministic FA

⇒ Non Deterministic FA

State machine

A Finite automata can be represented as

$\{Q, \Sigma, q, F, \delta\}$

Q = Finite set of states

Σ = set of input symbols

q = initial state

F = Set of Final states

δ = Transition function

build an FA for the inputs that ends with 'a'

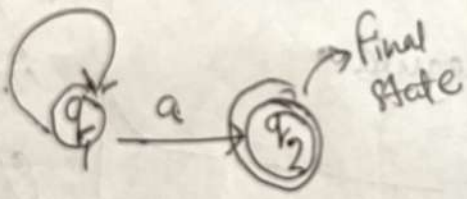
like - ba, bba, aba

Σ {a b} → input

$q = \{q_2\}$

$F = \{q_2\}$

$Q = \{q_1, q_2\}$



'ab'

ab, abab, bbab, aaab