Compilers
Implementing Finite Automata
Implementing FA

Regular expressions

Lexical Specification

NFA

DFA

Table-driven Implementation of DFA
A DFA can be implemented by a 2D table $T$

- One dimension is **states**
- Other dimension is **input symbol**
- For every transition $S_i \xrightarrow{a} S_k$ define $T[i,a] = k$
Implementing FA

State transition diagram:

- **S** (start state)
- **T** (state)
- **U** (state)

- **S** transitions to **T** on input 0.
- **T** transitions to **U** on input 1.
- **U** transitions to **T** on input 0.

Input symbols: 0, 1

States: S, T, U
Implementing FA
Implementing FA
• NFA -> DFA conversion is key

• Tools trade between speed and space