



*Lexical Analysis:  
DFA Minimization & Wrap Up*



# Automating Scanner Construction

## PREVIOUSLY

RE  $\rightarrow$  NFA (*Thompson's construction*)

- Build an NFA for each term
- Combine them with  $\epsilon$ -moves

NFA  $\rightarrow$  DFA (*subset construction*)

- Build the simulation

## TODAY

DFA  $\rightarrow$  Minimal DFA

- Hopcroft's algorithm

DFA  $\rightarrow$  RE (*not really part of scanner construction*)

- All pairs, all paths problem
- Union together paths from  $s_0$  to a final state

*The Cycle of Constructions*





# DFA Minimization

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## The Big Picture

- Discover sets of equivalent states
- Represent each such set with just one state