PPL 2/24

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Midterm

- Martin will create a midterm practice for us
- Fair game to include both practice questions and actual questions from the quizzes
- We can use **printed** notes/books but no electronics

LL Parsing

The Overall Algorithm

- Build First, Follow Sets
  - First set: terminals that can start some symbol
  - Follow set: terminals that can appear after replacing some non-terminal, focuses on the right-hand side of the production
- Example: $A \rightarrow B\ C\ D$
  - The terminals that will **follow** C are those that D can start with
  - The terminals that A can start with are **at least** the same as B

Building the First Sets

- FIRST(a): set of terminals that can start a strong of terminals
- T: set of terminal symbols
- N: Set of non-terminal symbols
- Rules
  - If t is in T, then First(t) = {t}
  - If X is in N and X $\rightarrow \epsilon$ exists, then add ϵ to First(X)
  - If X is in ? and X $\rightarrow Y_1 Y_2 \cdots Y_m, Y_i$ in N, then

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for i in 1...m:
    if (i = 1 or Y1...Yi-1 is nullable):
        First(X) = First(X) union First(Yi)
```

- Algorithm

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I'll fill this in later
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- The first of a token is always the token itself
- He's lost me now I have no idea what's happening

Building the Follow Sets

- If $ is the input end-marker, and S is the start symbol, $ is in FOLLOW(S)
  - Intuition being conveyed: the only symbol that can follow a complete program is the end of file
- There is a production, $A \rightarrow \alpha \underline{B} \beta$, then $(FIRST(\beta) - \epsilon) \subseteq FOLLOW(B)$
  - Intuition being conveyed: The symbols that follow B are those that start β

- If there is a production $A \rightarrow \alpha \underline{B}$ or a production $A \rightarrow \alpha \underline{B} \beta$, where $\epsilon FIRST(\beta)$, then $Follow(A) \subseteq Follow(B)$
  - Intuition being conveyed: B is (effectively) the last symbol on the right-hand side of the production, so its follow set should include the follow of A
- Algorithm

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I'll fill this in later
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- I know I have the definition of a Follow set above but it doesn't help me. What tf is a follow set?