MA/CSSE 474 Day 24 Announcements Summary

1) PDA for $L = \{a^m b^n : m \neq n; m, n > 0\}$.

2) Simple ways to reduce non-determinism (example on a slide):
   a) Add end-of-input marker $ to Σ
   b) Add bottom-of-stack marker # to Γ

3) PDA for $A^n B^n C^n = \{a^n b^n c^n : n \geq 0\}$.

4) The slides show how to use non-determinism to build a PDA for $\neg A^n B^n C^n$. If you don't understand it in class, be sure to go back and look at it.
5) The set of Context-free languages over alphabet Σ is **not** closed under complement. How do we know?

6) Is there PDA that accepts $\{ww : w \in \{a, b\}^*\}$

7) **Theorem**: The class of languages accepted by PDAs is exactly the class of context-free languages.
   Recall: *context-free languages* are languages that can be defined by context-free grammars.
   a) CFG → PDA is the easy direction, and the one with the most practical use
   b) Two approaches:
      i) Top-down parser
      ii) Bottom-up parser

8) Top-down parser PDA M from CFG G.
   a) Mirror the productions: Production A → XYZ becomes (q, ε, A) → (q, XYZ)
   b) Match terminal symbols: (q, a, a) → (q, ε)
   c) Get the process started: (s, ε, ε) → (q, S) [s is the start state of M, different from q][S is start symbol of G]
   d) The stack hold unmatched terminals and unexpanded nonterminals.

9) Show the steps in the top-down parse of the example on the "Another Example" slide (write small).

transition ***state*** ***unread input*** ***stack***

10) Show the transitions as the parser from the "bottom-up" slide parses "id + id * id"

transition ***unread input*** ***stack***