

Midterm 2

Some of the things to study and understand

- Determining if a language is context-free or not. Being able to prove if not context-free. Being able to find a grammar or pda if it is.
- Know how to construct pda's and dpda's using the transition functions δ .
Example: $\delta(q_0, 0, Z) = (q_1, AZ)$.
- Understand what it means for a context-free grammar or language to be ambiguous or not. Being able to show it is ambiguous by using parse trees. Understanding derivations and rightmost and leftmost derivations.
- Given a context-free grammar, eliminating λ -productions and unit productions. Be able to determine if the empty string is accepted and the language is finite or not. Understand algorithms involved in these eliminations using the production rules and dependency graphs as needed.
- Transforming a cfg into CNF and Greibach normal forms.
- Understanding closure properties of context-free languages and deterministic context free languages. Understanding algorithms and their existence for context-free languages (and grammars), such as for membership, determining if finite or infinite, equality of languages, etc.
- Equivalence / relationships between pda's and context-free grammars. Transforming one to the other.
- Understanding differences and capabilities between pda's and dpda's.
- Understanding acceptance by null stack versus final state for pda's and dpda's.
- Understanding the proofs that we covered. Being able to understand and use the pumping lemma for context-free languages.
- Understanding what it means for one machine, such as a pda being more powerful than another machine, such as an nfa (can recognize more languages).