CIT 596 Recitation, Week 7

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Some short but fun talks

WAT talk

- link, 4:17

Type System

- link, 4:15

bits of brilliant session five

- link, 2:02, 6:13

[Exercise] @sipser13 [p. 156] exercise 2.14

Convert the following CFG to CNF.

- $A \rightarrow BAB|B|\varepsilon$
- $B \rightarrow 00|\varepsilon$

Steps

- $A \to BAB|B|\varepsilon$
- $B \to 00|\varepsilon$
- First add a new start variable
- Remove $B \to \varepsilon$
- Remove $A \to \varepsilon$
- Remove $A \to A$
- Remove $A \to B$
- Remove $S \to A$
- Add additional variables and rules

[Exercise] @sipser13 [p. 155] exercise 2.6

Give context-free grammars generating the following language.

- The set of strings over the alphabet $\{a, b\}$ with more a's than b's
- $\{w\#x | w^R$ is a substring of x for $w, x \in \{0, 1\}^*\}$

[Exercise] @sipser13 [p. 155] exercise 2.9

Give a context-free grammar that generates the language

- $A = \{a^i b^j c^k | i = j \text{ or } j = k \text{ where } i, j, k \geq 0\}$

[Exercise] @sipser13 [p. 156] exercise 2.19

Let $\Sigma = \{a, b\}$. Give a CFG generating the language of strings with twice as many a's as b's. Prove that your grammar is correct.

[Exercise] @sipser13 [p. 157] exercise 2.27

Let $G = (V, \Sigma, R, STMT)$ be the following grammar.

- $STMT \rightarrow ASSIGN | IF - THEN | IF - THEN - ELSE$
- $IF - THEN \rightarrow$ **if condition then** $STMT$
- $IF - THEN - ELSE \rightarrow$ **if condition then** $STMT$ **else** $STMT$
- $ASSIGN \rightarrow$ **a:=1**
- $\Sigma = \{$**if, condition, then, else, a:=1**$\}$
- $V = \{STMT, IF - THEN, IF - THEN - ELSE, ASSIGN\}$
- Show G is ambiguous
- How to fix?