

CIT 596 Recitation, Week 9

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Some short but fun talks

New Java 8 has been released!

- ▶ Java 8 New Features and Scala, 6:29

[Exercise] @sipser13 [p. 155] exercise 2.4

Design PDAs for the following languages. In all parts, the alphabet is $\Sigma = \{0, 1\}$

- ▶ $\{w \mid \text{the length of } w \text{ is odd and its middle symbol is } 0\}$

[Exercise] @sipser13 [p. 157] exercise 2.23

Let

$$D = \{xy \mid x, y \in \{0, 1\}^* \text{ and } |x| = |y| \text{ but } x \neq y\}.$$

Show that D is a context-free language.

Solution

CFG approach

- ▶ $S \rightarrow AB|BA$
- ▶ $A \rightarrow XAX|0$
- ▶ $B \rightarrow XBX|1$
- ▶ $X \rightarrow 0|1$
- ▶ This can be easily proved to be correct.
- ▶ PDA approach?

Questions from CIS 511, special thanks
to Jean Gallier

Show the followings are context-free languages

- ▶ $L = \{xcy \mid |x| = 2|y|, x, y \in \{a, b\}^*\}$