# More examples of grammars

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# A simple one

Let $\Sigma = \{a, b\}$, $\mathcal{N} = \{S, T\}$ and the production rules be

- $S \to \varepsilon$
- $S \to aT$
- $T \to bS$

What is the language this describes?

# A simple one

Let $\Sigma = \{a, b\}$, $\mathcal{N} = \{S, T\}$ and the production rules be

- $S \to \varepsilon$
- $S \to aT$
- $T \to bS$

The resulting language is:

$$\{(ab)^n \mid n \in \mathbb{N}\} = \{\varepsilon, ab, abab, ababab, \ldots\}$$

# A complicated one

Let $\Sigma = \{a, b, c\}$, $\mathcal{N} = \{S, T, X, Y\}$ and the production rules be

- $S \to Tabc$
- $T \to \varepsilon$
- $T \to TXY$
- $XYa \to aXY$
- $Yb \to bY$
- $aXb \to aab$
- $bYc \to bbcc$

What is the language this describes?

# A complicated one

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- $T \to \varepsilon$
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This describes the language:

$$\{a^n b^n c^n \mid n \geq 1\} = \{abc, aabbcc, aaabbbccc, \ldots\}$$