### More examples of grammars

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## A simple one

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

- ightharpoonup S 
  ightarrow arepsilon
- S → aT
- ightharpoonup T 
  ightarrow bS

What is the language this describes?

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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

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- $ightharpoonup T 
  ightharpoonup \varepsilon$
- ightharpoonup T o TXY
- ightharpoonup XYa 
  ightarrow aXY
- ightharpoonup Yb o bY
- aXb → aab
- bYc → bbcc

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This describes the language:

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