

## Homework 7

1. Suppose the following grammar for positive numbers

2. Consider the following grammar

$$\begin{aligned} S &\rightarrow N \cdot P \\ P &\rightarrow V \cdot N \\ N &\rightarrow N \cdot N \\ N &\rightarrow A \cdot N \\ N &\rightarrow \text{student} \mid \text{trainer} \mid \text{team} \mid \text{trains} \\ V &\rightarrow \text{trains} \mid \text{team} \\ A &\rightarrow \text{The} \mid \text{the} \end{aligned}$$

where  $S$  is the start symbol and  $S$ ,  $P$ ,  $N$ ,  $V$  and  $A$  are non-terminals. Using the CYK-algorithm, check whether or not the following string can be parsed by the grammar:

The trainer trains the student team

3. **(Optional)** The task is to match strings where the letters are in alphabetical order—for example, `abcfjz` would pass, but `acb` would not. Whitespace should be ignored—for example `ab c d` should pass. The point is to try to get the regular expression as short as possible! See:

<http://callumacrae.github.com/regex-tuesday/challenge11.html>