Homework #4 *due 23:55, April 20 ,2021*

(1) (a) Consider a calculator that uses floating point decimal numbers with + and - signs as inputs and can do the four operations +, -, *, / as well as parentheses for forced priority. Describe a CFG that can express any computable arithmetic term that such a calculator (with unlimited memory to allow for expressions of any length) can accept.

(b) Draw the parse tree for the expression (0.23 / (5+3.1) - 20) *2 according to your CFG

(2) Write down a *CFG* that can generate any Boolean expression using the ***3*** logical operators $\wedge$ *(AND)* $\vee$ *(OR)* and $\neg$ *(NOT)* operating on *Boolean* variables ***x, y*** , ***z*** and constants ***T*** *(True)* and ***F*** *(False).* An example for such an expression ***E*** is :

$E = x \vee y \wedge (T \wedge \neg z)$

(3) From the main text

Exercises 5.1.2 (b), (c) , 5.1.3, 5.1.4 , 5.1.7