Homework 8

1. Suppose the following grammar for the WHILE-language:

$$
\begin{array}{lcl}
Stmt & \rightarrow & \text{skip} \\
 & | & Id := AExp \\
 & | & \text{if } BExp \text{ then } Block \text{ else } Block \\
 & | & \text{while } BExp \text{ do } Block \\
Stmts & \rightarrow & Stmt \text{ ; } Stmts \\
 & | & Stmt \\
Block & \rightarrow & \{Stmts\} \\
 & | & Stmt \\
AExp & \rightarrow & AExp + AExp \\
 & | & AExp * AExp \\
 & | & (AExp) \\
 & | & Num \\
 & | & Id \\
BExp & \rightarrow & AExp = AExp \\
 & | & AExp \neq AExp \\
 & | & \text{false} \\
 & | & \text{true}
\end{array}
$$

   Transform this grammar into Chomsky normalform.

2. Write a program in the WHILE-language that calculates the factorial function.