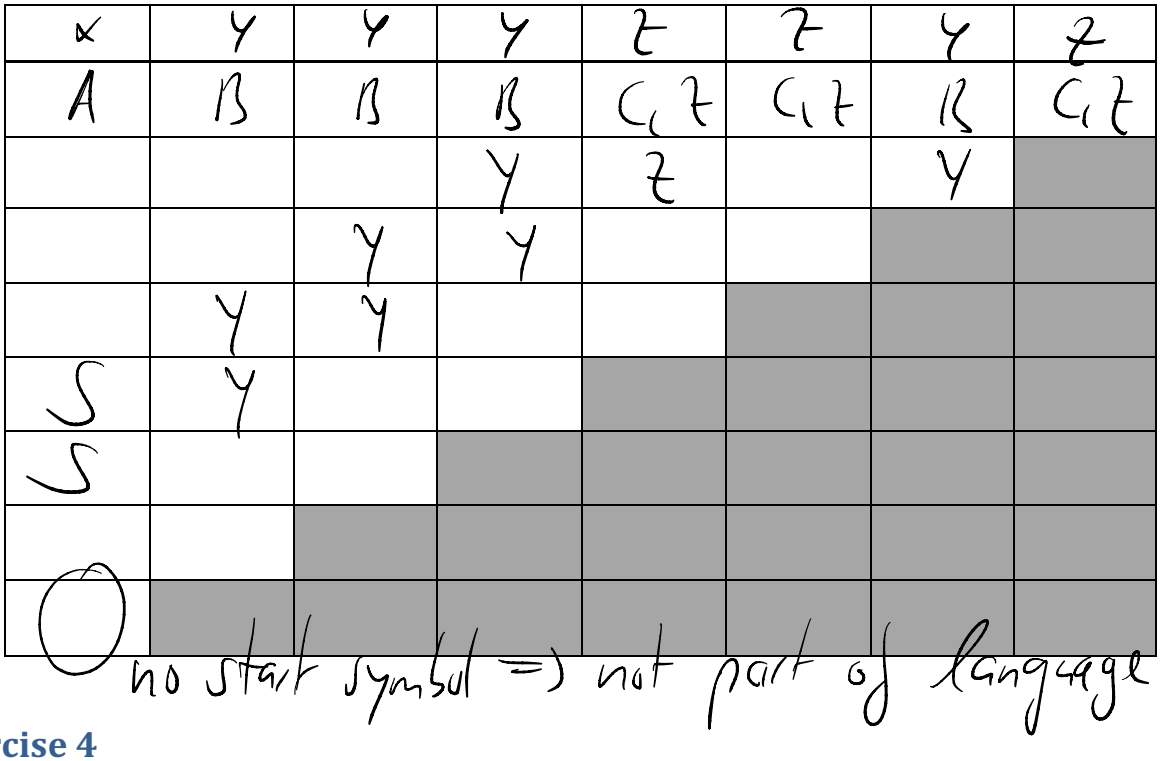
We will do the following exercises together during the tutorial:

Exercise 3

Consider the grammar with V = { S, A, B, C, Y, Z }, Σ = {x, y, z}, start symbol S, and production rules:

S → AS | AY
A → x, B→ y, C → z, Z → z
Y → BY | BZ
Z → CZ

Using the CYK algorithm, check whether the word xyyyzzyz is part of the language defined by the grammar. Fill in the table below:



Exercise 4

Consider the grammar with V = { S, Y, Z }, Σ = {x, y, z}, start symbol S, and production rules:

S → xS | xY
Y → yY | Zy
Z → Zz | z

a) What type of the Chomsky hierarchy is this grammar? Restrict the type as much as possible, justify your answer.
b) Specify the associated language in set notation. What type is the language of?
c) Construct a Turing machine that accepts this language. Trap states may be omitted.
d) Convert the grammar to Chomsky normal form. Show the required steps.