Homework – 7

(This homework is harder than usual, just try your best.)

1. Use the pumping theorem to show that the following languages are not context-free

a).

suppose on the contrary that L={www:w} is CFG, then there exists some sufficiently large number P, for any n >= P, we have =uvxyz such that |vy|>0, |vxy|<=P, and for any i>=0.

Pick n = P and consider =uvxyz, |vxy|<=P

For all the cases, no matter pump i for any number greater than 0, the result string is not in L anymore. So, its contradiction with our assumption.

b).

this is similar with

1. Decide whether the following language is context-free or not, and state your reason:

a).

this is context-free because the PDA for this language is limilar in class:

Diagram

Description automatically generated

b).

this is also context-free and similar to the PDA above.

c).

this is not context-free because this problem is equal to