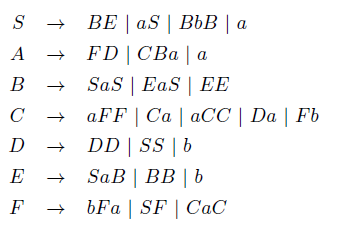
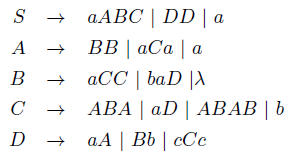
Comp 310 Homework 5 Jared Fowler



…Remove Unreachable Productions…



NULLABLES: B, A, C



Assume that it is Context Free. Pumping Lemma gives a fixed M.

There exists a split where

Because |vxy| is less than or equal to M, this portion of the word can either exits entirely in w\_1, or entirely in w\_2, or it can exist in in the b’s in w\_1 and the a’s in w\_2. In any of these cases, the pumping lemma allows us to repeat v and y. By doing so we change the content of w\_1, or that of w\_2, or of both w\_1 and w\_2 but only the b’s in w\_1 and the a’s in w\_2. This is a valid word because the Pumping Lemma says so. On the other hand, after this repeat w\_1 is no longer the same as w\_2 and we therefore have a contradiction.



Assume that it is context free, therefore the pumping lemma applies. Fix the M given by the pumping lemma.



Yes. We can simply reverse the order the terminals and variables to the right of the production.

Example:



Notes: We know that the union of two C.F.’s is C.F. . Therefore, what we really need to prove is if the set difference between two C.F. languages is C.F., or if the intersection of a C.F. and a non-C.F. is C.F. .

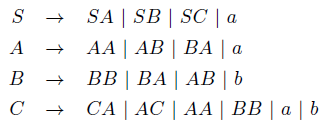
We can use the same example that we would use to prove set difference false.

L\_1 represents the universe, so the symmetric difference, would be the compliment of L\_2 which was proven in class to not be context free. Therefore **NO.**



abaabbb : yes

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | SAC | SABC | SABC | SABC | SABC | SABC | SABC |
| a |  | BC | ABC | ABC | ABC | ABC | ABC |
|  | b |  | SAC | SAC | SABC | SABC | SABC |
|  |  | a |  | SAC | SABC | SABC | SABC |
|  |  |  | a |  | BC | BC | BC |
|  |  |  |  | b |  | BC | BC |
|  |  |  |  |  | b |  | BC |
|  |  |  |  |  |  | b |  |

 baabb : no

aabb : yes