**Demonstrate that the set of context-free languages is not closed over the operation of intersection. Use {a n b n c n | n ≥ 0} is not context free.**

* CFLs are closed under union, concatenation.
* CFLs are not closed under intersection or complementation.
* L1 = {anbncm ∣ n,m≥0}*L*1={*anbncm*∣*n*,*m*≥0}: equal number of *a*'s and *b*'s, any number of *c*'s.
* L2 = {ambncn∣m,n≥0}*L*2={*ambncn*∣*m*,*n*≥0}: equal number of *b*'s and *c*'s, any number of *a*'s.

Both L1 and L2 are context-free.

The intersection L1∩L2is:

L1∩L2 = {anbncn∣n≥0} which is not context free by pumping lemma. (Expand on the pumping lemma proof)

https://en.wikipedia.org/wiki/Pumping\_lemma\_for\_context-free\_languages

This is the set of strings with equal numbers of *a*'s, *b*'s, and *c*'s.

**Conclusion**

* L1 and L2 are both context-free.
* Their intersection is not context-free.
* Therefore, CFLs are not closed under intersection.