Prework 2.3a: Pumping Lemma for Context-Free Languages

Write your preliminary solutions to each problem and submit a PDF on Canvas. The names in brackets indicate the subset responsible for presenting the problem.

1. [Joshua, Andrew, Levi] Prove that the language $A = \{0^n1^n0^n1^n \mid n \geq 0\}$ is not context free.
2. [Connor, Meghan, Grace] Let B be the language of strings in $\{0,1\}^*$ consisting of all palindromes that have the same number of 0's as 1's. Prove that B is not context free.
3. [Curtis, Micah, Ky] Explain how the result of Problem 2 can be used to prove that the set of context-free languages is *not* closed under intersection.
4. [Ben, David, Allie, Todd] Let $\Sigma = \{\mathtt{a}, \mathtt{b}, \mathtt{c}, \mathtt{d}\}$, and let C be the language of strings in Σ^* having the same number of a's as b's and the same number of c's as d's. Prove that C is not context free.

BEGIN YOUR SOLUTIONS BELOW THIS LINE