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CS340 Assignment 4 – Starvation

* Consider the 2nd attempt from the lecture notes. Is the “No Starvation” condition satisfied?
  + The “No Starvation” condition is not satisfied. P0 exits the loop if flag[1]=false, and sets flag[0]=true to enter the Critical Section. Meanwhile, P1 will check that flag[0]=true and busy-waits. P0 will loop out and still exit the next loop because P1 is still busy-waiting, and won’t have the chance to set flag[1]=true. P1 will keep starving while P0 will keep going to the Critical Section since flag[1] will never be true if P1 can’t get out of the while loop.
* Prove that the Peterson Solution is correct by showing that all 3 conditions for a correct solution to the Critical Section Problem are respected.
  + The Peterson Solution works because it satisfies Mutual Exclusion, Progress Requirement, and Bounded Waiting. It satisfies Mutual Exclusion because when P0 is in the Critical Section, then flag[0]=true and flag[1]=false, or turn=0, which shows that P1 can’t enter the Critical Section. This solution also satisfies the Progress Requirement because when O0 is not in the Critical Section, flag[0]=false and turn=1, so therefore P1 can execute the Critical Section. This solution also satisfies Bounded Waiting because after P0 or P1 executes the Critical Section, it gives priority to the other process by setting its own flag to false, so the other process may enter.