

# CS4510: HW6

Due: Oct 16 before 3pm on Gradescope (there is a link on Canvas)

Separate page for each problem

You should write the solutions on your own,  
and include the names of all students you talk to.

**1. CFG/PDA.** [2 points]

Write a context free grammar for  $\{0^i 1^j 0^k \mid j > i + k\}$ .

Describe a pushdown automata for it.

**2. Closure.** [2 points]

Give a CFG for the same language  $(\{0^n 1^n\}^* \cup \{(01)^n (10)^n\} \cdot \{(10)^n\})^*$ .

**3. Not Context Free.** [2 points]

Prove that  $\{1^n : n \text{ is prime}\}$  is not context free.