COT 4521-001: Introduction to Computational Geometry (Fall 2018)

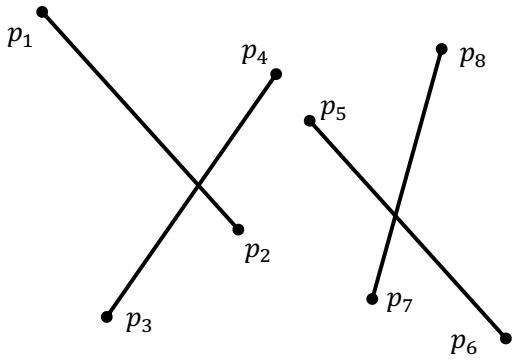
Worksheet 1

1 Ground Rules

This assignment is intended to be done alone. You may ask others for high-level help. However, the answer must be yours.

2 Assignment

1. Does $2^{n+1} = O(2^n)$? If not, what does it equal?
2. Does $2^{2n} = O(2^n)$? If not, what does it equal?
3. Prove by mathematical induction that the following formula, $3^2 + 3^3 + ...3^n = 9\left(\frac{3^{n-1}-1}{2}\right)$, holds for $\forall \geq 2$.
4. Determine whether the orientation of the following triangles (show your work).
   - $\{\{2,3\},\{5,6\},\{3,5\}\}$
   - $\{\{3,2\},\{1,6\},\{4,4\}\}$
   - $\{\{1,4\},\{5,6\},\{9,8\}\}$
5. Show the 10 iterations of the line sweep algorithm on the following set of segments. At each step show the event queue, segment order, and indicate which segments are compared for intersection.



3 Submission

Upload your answers and associated work to canvas as a single scanned, types, or photographed PDF document. Be sure that your submission is legible.