

Announcements:

1. Office hours tomorrow rescheduled to 2-3 only in ACES 3.420. I will hold an additional office hour on Friday from 9-10 AM.
2. So far all regradings of the first exam have only increased scores. Please consider bringing in your exams for regrading, as it's likely your scores will go up.
3. There will be a quiz Thursday February 21, on graphs, reading and writing mathematics, and combinatorial counting.
4. Clarification of the homework policy. While I encourage you to work on the homework with your colleagues in the class, if you do collaborate, you must list all the names of all the people with whom you worked on the top of your homework. You must also make sure that you have not *copied* their solutions (or made minimal changes in order to make it look like you didn't copy). You may work together to achieve a solution, but you must write it completely by yourself. If your solutions look essentially like they have been copied from each other, you will be asked to come to office hours and do the solutions at the board without notes, to verify that you understand the work you submitted. Your homework grade will then be based upon what you present in office hours, and not just on the written solution.

Homework, due February 19 (Tuesday)

1. Write out the solutions to all the problems on the first exam.
2. Let $P1$, $P2$, $P3$, and $P4$ be the graph-theoretic properties defined by

$$P1 : \forall v \in V, \exists y \in V \text{ s.t. } (v, y) \in E,$$

$$P2 : \exists v \in V \text{ s.t. } \forall y \in V, (v, y) \in E,$$

$$P3 : \exists (v, w) \in E \text{ s.t. } \forall a \in V [(a, v) \in E \text{ or } (a, w) \in E].$$

$$P4 : \exists (v, w) \in E \text{ s.t. } (a, b) \in E - (v, w) \Rightarrow \{(a, v), (a, w), (b, v), (b, w)\} \cap E \neq \emptyset.$$

where V denotes the vertex set of the graph and E denotes the edge set of the graph.

For each ordered pair of properties, give an example of a graph satisfying the first property but not the second, or prove that no such graph exists.

3. Write out formally the graph theoretic property of a graph being a clique.