Homework 5: Chapter 3

Reading: Chapter 3 pgs 17-20, Appendix A pgs 195-198
Exercises:

1. From the book: 3.1, 3.2, and 3.4
2. Use the following example to show that sequential comparison fails the unanimity criterion, with candidates ordered alphabetically:

1	1	1
A	C	B
B	A	D
D	B	C
C	D	A

3. Our solution to Exercise (2.5) from class happens to also show that pairwise comparison admits losing spoilers. I'll recall the example here:

1	1
X	Z
Y	X
Z	Y

   Show that there is a losing spoiler for ALL POSSIBLE examples satisfying the conditions in Exercise (2.5), as long as $n = 3$. (Hint below)

   Bonus round: (optional) construct an example with $n = 4$ which satisfies the conditions of Exercise #2.5, but doesn't have any spoilers.

4. Prove that if there is a Majority candidate, there will **not** be any spoilers for **plurality**.
5. Prove that if there is a Condorcet candidate, then there will **not** be any spoilers for **pairwise comparison**. Complete Exercise (3.4) to notice that Condorcet candidates can be spoilers for **plurality**.

Book solutions.

Other solutions (in progress-ish)

Hint to Exercise 2: Draw the comparison graph for the example in class. Can you draw it for any example with $n = 3$ under the conditions of Exercise 2.5?

Now, consider an election with any number of n candidates. Consider the comparison graph. If you remove one candidate, how does the new comparison graph change?