As some of you pointed out in the very first class, the assignment scheme in this course is a game. Let’s analyze this game.

There are 150 students, last time I checked, broken up into 30 groups of 5. You know that if your group has the highest overall assignment average then you do not need to complete the final assignment and will receive full credit for it. This is highly desireable for you, since you are interested in maximizing your assignment score. Hence, it is in your best interest to award your group members perfect grades for every assignment. But Carly is watching you! She grades some assignments herself, and if the grades you assign do not match up to hers, she cuts your (true) grade in half. For each of the following questions, suppose that each student’s grade (including yours) is a random variable: with 15% chance their grade is 16, 20% it is 17, 30% it is 18, 20% it is 19, and 15% it is 20.

1. Suppose Carly grades only 21 individual submissions for each assignment at random. Also, every group is honest. Should your group cheat or not? If your group cheats, each group member gives every other group member 20/20 on each of the assignments; there’s no going back to honesty.

2. How many assignments does Carly need to grade in order for the solution of (a) to no longer hold?

3. In reality, your group will not strictly cheat or not cheat, but will use some combination of these strategies. What is the minimum mix of cheating/not cheating that your group should adopt if Carly checks only 21 submissions each assignment and no other groups cheat. That is, what is the minimum proportion of assignments your group should cheat on?

4. If all individuals cheat but you do not know how much, and Carly marks only 15 submissions, what is your best strategy?

5. Suppose Carly catches on to people cheating and starts marking 30 submissions per assignment. What is your best strategy?