**A Model of Attendance in FLEX Classes**

Consider students in a FLEX class. Each student has the option to attend in person, or, to participate online. The number of students is normalized to 1. A fraction, n, will never attend in person. A fraction, a, will always attend in person. The remainder, a fraction denoted m, will attend if and only if they gain more utility attending than not attending. Call them never attenders, always attenders, and maximizers, a+m+n=1. Assume that 0<a, 0<n, and 1>m>a+n (which, for whatever it may be worth, implies m>0.5, a<0.5, and n<0.5).

Never attenders and always attenders are external players—their behavior is determined by rule, not by strategic interaction within the game.

For optimizers, we normalize the utility of participating online to 0. Their payoff from attending in person depends on the fraction of the class that attends, f, according to the payoff function ui=fGi-L. This reflects that maximizers care about the interactive experience of attending, not just face time with the professor. If no one attends other than themselves, their utility is -L<0, reflecting the cost of attendance and the fact that there is no potential interaction to be had. If everyone attends, their utility is Gi-L≥0. (As an aside, this implies we can think of never attenders as those individuals with L>Gi, though surely there are other reasons some may behave that way.)

For maximizers, assume Gi is uniformly distributed on the interval [L,H]. Finally, let x denote the fraction of maximizers that attend, so that f=xm+a.

Characterize and discuss the rationalizable and Nash equilibrium outcomes of this game and the applicability of the model to this semester at Poly. Specifically, address the following list of items:

1. For what, if any, values of L and H is x=0 the only equilibrium?
2. For what, if any, values of L and H is x=0 the only rationalizable outcome?
3. For values of L and H where a positive value of x, or a range of such values, may be rationalized, if any, what are the rationalizable outcomes?
4. For values of L and H where a positive value of x, or multiple such values, represent an equilibrium or equilibria, what are the equilibria?
5. Discuss how the parameters L and H impact the attendance outcome.
6. Discuss whether or not, and why, this model, and your solution, give any insight into attendance in FLEX classes at Poly this semester, as you have perceived it. Include in this some discussion of what the implicit and explicit assumptions of the model are and whether they seem reasonable enough to provide any useful insight. If any are particularly unreasonable in a way that makes the model useless, what are they and why do you think that? Remember, it is a model, we don’t want perfect realism, rather simplicity with enough reasonable resemblance to reality to be analytically useful.
7. If faculty would like to increase x, how could they influence the values of L and H to do so? Why? Should they do so? Why? Are there better alternatives to improve the experience of maximizers? What are they? Why are they better?