

EVOLUTION AND THE THEORY OF GAMES

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Exercises 31-10-2014

1. Take the example of Big Joe and Little Joe under the banana tree (section 6 on page 4 of lecture notes 11-11-2011), and solve, if possible, for dominant strategy solutions if **(a)** Little Joe makes the first move and if **(b)** both players move simultaneously. Finally, **(c)** suppose Big Joe decides who is going to make the first move. How would you model this situation and how would you solve it?

2. Solve the following game for dominant strategy solutions if only pure strategies are allowed:

	y_1	y_2	y_3	y_4
x_1	4 , 5	5 , 3	5 , 6	4 , 4
x_2	5 , 3	2 , 1	3 , 5	5 , 2
x_3	2 , 6	6 , 3	4 , 2	5 , 5

3. For the payoff matrix in the previous exercise, find all **(a)** Hicks solutions, **(b)** Pareto optima, **(c)** minimax solutions and **(d)** maximax solutions if only pure strategies are allowed, and **(e)** discuss under that circumstances the different solution concepts make sense in some way or another.

4. Two friends are trying to decide where to go for dinner. One favours Chinese (C), and the other favours Italian (I), but if possible they would like to go together. The corresponding payoff matrix (in whatever units) is given below:

	C	I
C	1 , 4	0 , 0
I	0 , 0	4 , 1

Find all **(a)** dominant strategy solutions, **(b)** Hicks solutions, **(c)** Pareto optima, **(d)** minimax solutions and **(e)** maximax solutions if only pure strategies are allowed.