

Exercises for L7 and L8

3.1. What is a static Bayesian game? What is a (pure) strategy in such a game? What is a (pure-strategy) Bayesian Nash equilibrium in such a game?

3.2. Consider the following strategic situation. Two opposed armies are poised to seize an island. Each army's general can choose either "attack" or "not attack". In addition, each army is either "strong" or "weak" with equal probability (the draws for each army are independent), and an army's type is known only to its general. Payoffs are as follow : The island is worth M if captured. An army can capture the island either by attacking when its opponent does not or by attacking when its rival does if it is strong and its rival is weak. If two armies of equal strength both attack, neither captures the island. An army also has a "cost" of fighting, which is s if it is strong and w if it is weak, where $s < w$. There is no cost of attacking if its rival does not.

Identify all pure strategy Bayesian Nash equilibria of this game.

3.4. Find all the pure-strategy Bayesian Nash equilibria in the following static Bayesian game:

1. Nature determines whether the payoffs are as in Game 1 or as in Game 2, each game being equally likely.
2. Player 1 learns whether nature has drawn Game 1 or Game 2, but player 2 does not.
3. Player 1 chooses either T or B ; player 2 simultaneously chooses either L or R .
4. Payoffs are given by the game drawn by nature.

	L	R
T	1, 1	0, 0
B	0, 0	0, 0

Game 1

	L	R
T	0, 0	0, 0
B	0, 0	2, 2

Game 2