

EE672: Game Theory for Wireless Networks
Homework no 4.

Problem: Army 2, of country 2, is occupying an island between countries 1 and 2. Army 1, of country 1, must decide whether to attack army 2. In the event of attack, if army 2 is strong, it will fight army 1, if it is weak, it will retreat over a bridge to its mainland. Each army prefers to occupy the island than not to occupy it (payoff 10, versus 0). A fight is the worst outcome for both armies (payoff = x). Army 1 does not know the type of army 2, it assumes it is strong with probability $\frac{1}{2}$.

(a) What is the Bayes-Nash equilibrium selection for army 1, if $x = -20$?

(b) Repeat for $x = -3$.

(c) Model this game as a signaling Bayesian game: army 1 can decide to signal its type by burning the bridge to the mainland and thus eliminating its option to retreat. For what value of x does army 2 have the incentive to burn the bridge? What is the equilibrium of the signaling game for your determined value of x ?