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Problem Set 8 (Extensive Games II)

1. Two Families Conflict

Two families are fighting over an object worth v for both of them. The fight will end when one of the families gives up. As long as they fight, family i suffers a loss of c_i per day. Family 1 first holds a family council meeting in which it decides when it will yield. This decision is transmitted to family 2, who meets a few hours later and decided when it will yield.

Analyze the subgame perfect equilibrium of this game.

Would the SPE be different if family 1 could meet again and revise its decision after family 2 has made a decision?

2. Implementation

You are a mediator in a case where two neighbors cannot agree on how to split the $100 cost of hiring a gardener for their common garden.

Each neighbor knows the value that he and his neighbor assign to the employment of the gardener. But, in order to pay less, each claims that he values the garden less than his neighbor, who values the garden dearly. Denote by v_i the value of hiring the gardener in the eyes of neighbor i.

Your aim is to make sure that the gardener will be hired if the sum of the values of the two parties is above 100 and will not be hired if the sum is below 100. You force the parties to participate in the following two stage procedure:

Stage 1: Neighbor 1 is asked what is the maximum amount he is ready to pay (recall that he can cheat).

Stage 2: Neighbor 2 is asked what is the maximum amount he is ready to pay.

Outcome: If the sum does not exceed 100, the gardener is not hired.

If the sum is 100 or more, the gardener is hired and each pay the gardener the number he declared.

Show that whatever the values of v_1 and v_2, the Subgame Perfect Equilibrium outcome is that the gardener will be hired if $v_1 + v_2 > 100$ and will not be hired if $v_1 + v_2 < 100$.

Show that this is not the case if the two neighbors are asked to report their values simultaneously.