7.5. Two-person sequential bargaining

Problem 7.5.1. Suppose a buyer is thinking of making an offer on a house that is listed at $150,000. The buyer can make an offer that the seller can accept, or that the seller can reject and make a counter-offer. The buyer then has the chance of accepting the counter-offer or rejecting it and making one final counter-offer. The bargaining then ends at this stage with an acceptance or a rejection by the seller.

a. Sketch the sequential bargaining game when the discount rate is $\delta_1 = \delta_2 = 0.99$ between offers and counter-offers and the reservation price of the seller is known to be $135,000. (The reservation price is the price below which the seller will refuse to sell).

b. Solve the 3-period bargaining game that was sketched in part (a).

Solution: (a) The 3-period sequential game is shown in Figure 7.9, where $\delta_1 = \delta_2 = 0.99$.

Figure 7.9.

(b) The game is a three-period bargaining game with the payoff $(0,0)$ in case there is no agreement. According to Theorem 7.29, the subgame perfect equilibrium in this 3-period bargaining game is given by

$$s^*_1 = 1 - \delta_2 (1 - \delta_1) = 1 - 0.99 	imes (1 - 0.99) \approx 0.99,$$

and

$$s^*_2 = \delta_2 (1 - \delta_1) = 0.99 \times (1 - 0.99) \approx 0.01.$$

That is, the buyer gets 99 percent of the pie and the seller gets 1 percent.