1. [20 points] Use techniques we developed in class to find the (possibly mixed) strategy equilibrium of this game. This is a two player game. Player 1 and 2 each move simultaneously (the dotted line joining Player 2's first moves indicate 2 makes her choice without seeing what 1 has selected.). After they move, either the game ends or else if (U,L) is played, Player 2 gets to move again and selects either *l* or *r*. Before this second move, Player 2 observes the move of Player 1.The payoffs show first Player 1, then Player 2. (Hint: use a combination of solving for maximin and back to front reasoning.)
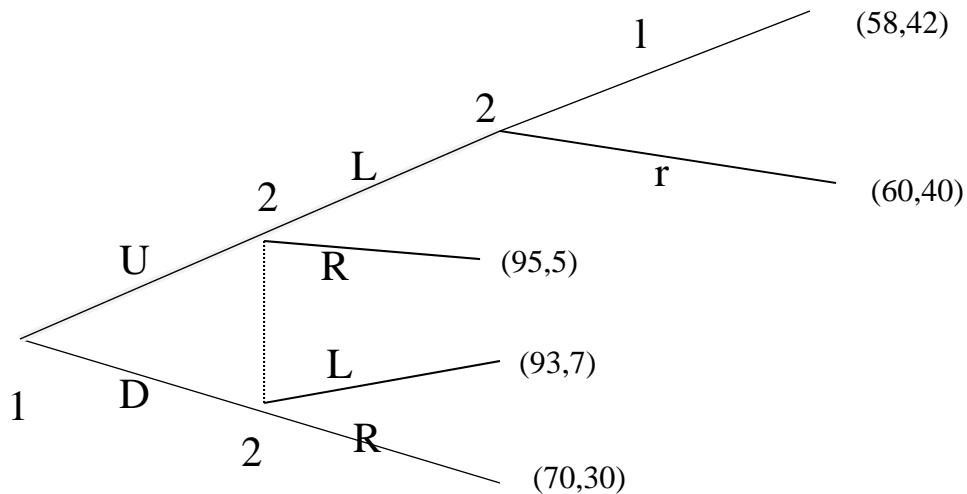
2. [10 points] The next game is like the game in 1), however, instead of outcome (70 ,30), Player 1 also has an option to accept that outcome (if it occurs out of the first two moves) or else select the option (96 ,4).. Player 1 gets to make that choice after seeing if the play (D,R) has occurred. Draw the game tree that represents this new situation. Determine the equilibrium outcome of this game. Does Player 1 benefit from having this additional choice? Explain.

3. Consider the following simplification of the so-called incentive auctions that the FCC would like to run. There are four TV broadcast stations, A,B,C, and D holding licenses to use frequency in a given area. The values to the four different owners of the stations of continuing to operate (staying on air) are given by *(1.5, 1.3, 1.8, 2.0)* respectively (in millions of dollars). The FCC will start a clock at $2.5 million and have it drop by $0.1 million in each round. Owners each have a button and after each tick down of the clock they can press it. When they press it, they have to leave the auction which means they do not get to sell their station. The clock stops ticking down when there is only one station left. That station sells its license at a price equal to the number on the clock.

i) [10 points] Determine the optimal strategies of each station and find which wins and at what price.

ii) [10 points] Suppose the FCC wishes to buy two stations and modifies the auction so that the clock stops when only two stations remain. Those stations then sell at the clock price. Repeat your answer for part i) for this case.

4. Suppose that a committee of 100 people are voting to decide on following one of four alternatives: a,b,c,d. The committee preferences over these can be split into three groups shown in the table below. (The highest row is most preferred, then next preferred in the row below etc.)

i) [10 points] Describe how a Borda count (with values 4,3,2,1) would operate in this situation and determine the winner assuming all members voted sincerely according to their preferences.

ii) [10 points] Show that there is at least one group that would actually prefer not to vote sincerely assuming the members of the other group do vote sincerely.

Group	I	II	III
Group Size	35	45	20
Rank			
1	a	b	d
2	d	c	a
3	c	a	c
4	b	d	b