Assignment on 10 March

0-Sum10.

For the following matrix games, reduce by domination and solve.

(i)

10	3	7	3
2	6	4	7
6	2	3	5

(ii)

1	1	0	0	0
0	0	1	0	1
0	1	0	1	0
1	0	0	0	1
0	0	0	1	1

(iii)

1	1	0	0	0	0	0
0	1	1	0	0	0	0
0	0	1	1	0	0	0
0	0	0	1	1	0	0
0	0	0	0	1	1	0
0	0	0	0	0	1	1

0-Sum11.

Solve the following symmetric games.

(i)

0	1	−2
−1	0	3
2	−3	0

(ii)

0	−2	2
2	0	−3
−2	3	0

0-Sum12.

For the following matrix game (0.2, 0.6, 0.2) is a safety strategy of Player I.

12	-35	-2	-2	64	8
0	6	-11	20	0	-6
-7	7	25	-3	-74	10

Find the value of the game and a safety strategy of Player II.

0-Sum 13. For the following matrix game, it is given that $(52/143, 50/143, 41/143)$ is an optimal strategy for Player I.

$$\begin{pmatrix} 0 & 5 & -2 \\ -3 & 0 & 4 \\ 6 & -4 & 0 \end{pmatrix}$$ Find an optimal strategy for Player II.

0-Sum 14. Let A be an $n \times n$ matrix game and that A is invertible. Suppose further that Player II has an optimal strategy which is also an equalizing strategy. Find a formula of the value in terms of A.

(This is basically an exercise in Linear Algebra.)

0-Sum15.

For the game Matching Pennies, write it in the form of a linear programming problem as in the lecture.

Ext1.

The Silver Dollar. Player II chooses one of two rooms in which to hide a silver dollar. Then, Player I, not knowing which room contains the dollar, selects one of the rooms to search. However, the search is not always successful. In fact, if the dollar is in room #1 and I searches there, then (by a chance move) he has only probability 1/2 of finding it, and if the dollar is in room #2 and I searches there, then he has only probability 1/3 of finding it. Of course, if he searches the wrong room, he certainly won't find it. If he does find the coin, he keeps it; otherwise the dollar is returned to Player II. (i) Draw the game tree. (ii) Suppose Player II is given one more chance to search if he/she does not see the coin. Draw the game tree.