CS 540-1: Introduction to Artificial Intelligence **Fall 2014-15**

Homework Assignment 6

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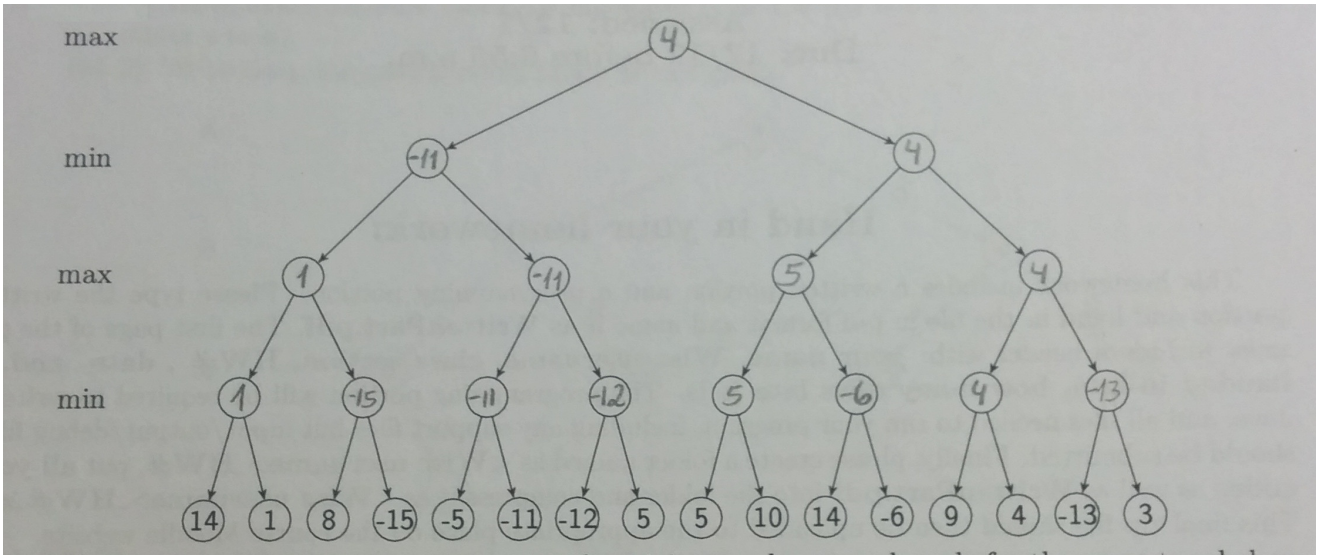
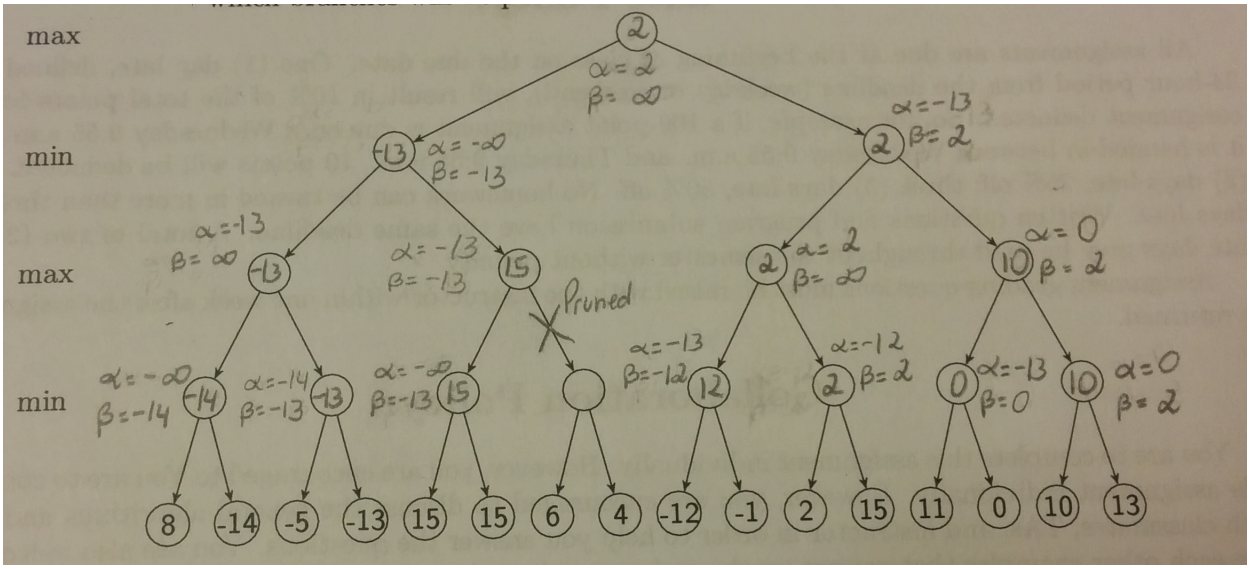
Question 1 - Game Playing

a) Minimax



b) Alpha-Beta Pruning



Question 2 - Game Theory

a) Zero-sum game

(a)

Player A

Strategy 1: a=L; d=L

Strategy 2: a=L; d=R

Strategy 3: a=R; d=L

Strategy 4: a=R; d=R

Player B

Strategy 1: b=L; c=L

Strategy 2: b=L; c=R

Strategy 3: b=R; c=L

Strategy 4: b=R; c=R

(b)

Matrix Normal

PA / PB	S1	S2	S3	S4
S1	-1	4	5	5
S2	-1	4	-2	-2
S3	2	2	5	5
S4	2	2	-2	-2

b) Non-zero game

(a)

A / B	I	II	III	IV
I	3,5	1,3	3,2	8,3
II	6,5	1,4	4,8	1,3
III	7,9	9,5	2,6	3,2
IV	3,9	6,2	3,6	5,4

B-I dominates B-II and B-IV

A / B	I	III
I	3,5	3,2
II	6,5	4,8
III	7,9	2,6
IV	3,9	3,6

A-II dominates A-I and A-IV

Final Matrix Form after find the strictly dominated strategies:

A / B	I	III
II	6,5	4,8
III	7,9	2,6

(b)

Looking at the table it is possible to see that there are two equilibrium points (4,8) and (7,9), where both maximize their values. However, as both want to maximize their score as more as they can, A will choose strategy III and B will choose strategy I, then it will end with A=7 and B=9, where both maximize their scores.