CS-171, Intro to A.I. — Quiz#2 — Fall Quarter, 2013 — 20 minutes

YOUR NAME AND EMAIL ADDRESS: _____

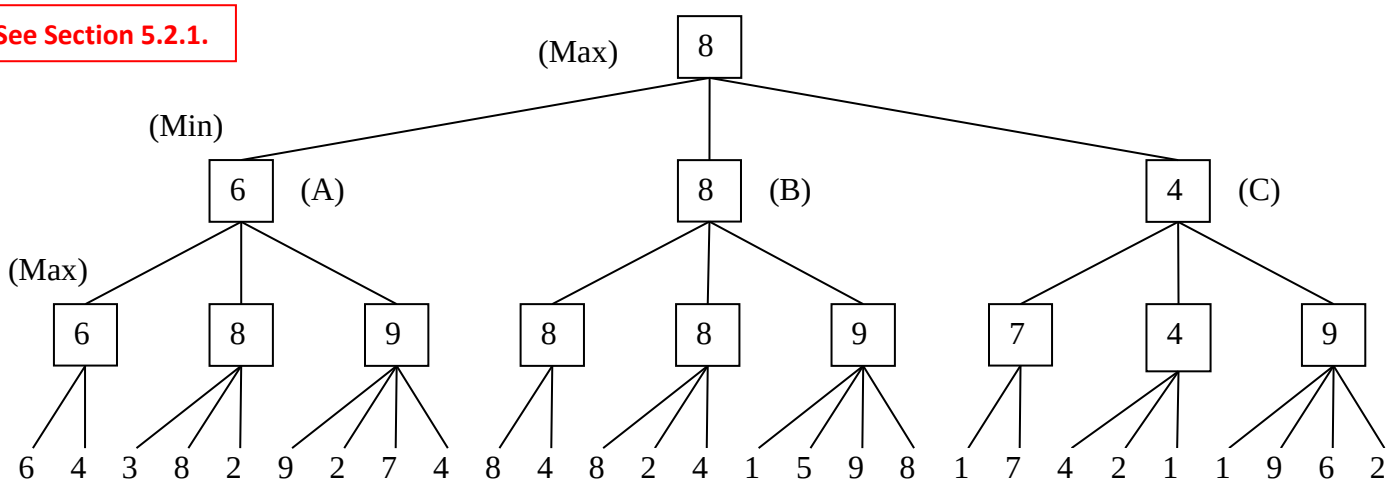
YOUR ID: _____ ID TO RIGHT:_____ ROW:_____ NO. FROM RIGHT:_____

1. (30 pts total, -5 pts for each error, but not negative) MINI-MAX SEARCH IN GAME TREES. The game tree below illustrates a position reached in the game. Process the tree left-to-right. It is **Max**'s turn to move. At each leaf node is the estimated score returned by the heuristic static evaluator.

1.a. Fill in each blank square with the proper mini-max search value.

1.b. What is the best move for Max? (write A, B, or C) __B_____

See Section 5.2.1.



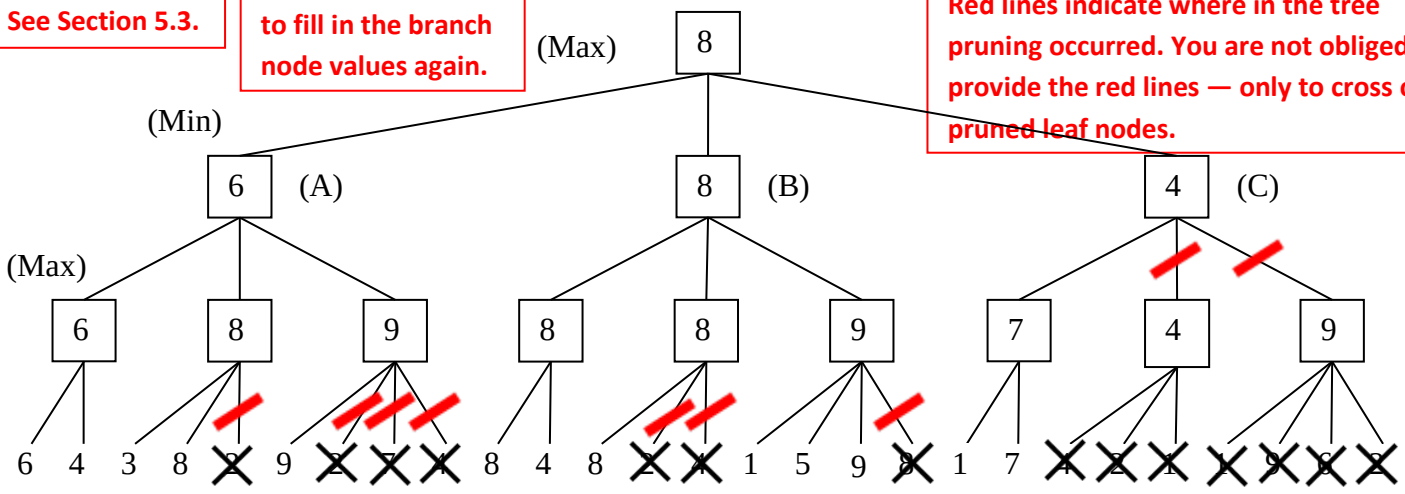
2. (30 pts total, -5 for each error, but not negative) ALPHA-BETA PRUNING. Process the tree left-to-right. This is the same tree as above (1.a). You do not need to indicate the branch node values again.

Cross out each leaf node that will be pruned by Alpha-Beta Pruning.

See Section 5.3.

You are not obliged to fill in the branch node values again.

Red lines indicate where in the tree pruning occurred. You are not obliged to provide the red lines — only to cross out pruned leaf nodes.



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3. (20 pts total, 2 pts each) ADVERSARIAL (GAME) SEARCH CONCEPTS. For each of the following terms on the left, write in the letter corresponding to the best answer or the correct definition on the right.

D	Game Strategy	A	Approximates the value of a game state (i.e., of a game position)
H	Cut-off Test	B	In all game instances, total pay-off summed over all players is a constant
E	Alpha-Beta Pruning	C	Tree where nodes are game states and edges are game moves
G	Weighted Linear Function	D	Function that specifies a player's move in every possible game state
J	Terminal Test	E	Returns same move as MiniMax, but may prune more branches
I	ExpectiMiniMax	F	Optimal strategy for 2-player zero-sum games of perfect information, but impractical given limited time to make each move
C	Game Tree	G	Vector dot product of a weight vector and a state feature vector
A	Heuristic Evaluation Function	H	Function that decides when to stop exploring this search branch
B	Zero-sum Game	I	Generalizes MiniMax to apply to games with chance (stochastic games)
F	MiniMax Algorithm	J	Function that says when the game is over

4. (20 pts total, 2 pts each) CONSTRAINT SATISFACTION PROBLEM (CSP) CONCEPTS. For each of the following terms on the left, write in the letter corresponding to the best answer or the correct definition on the right.

G	Minimum Remaining Values Heuristic	A	Set of allowed values for some variable
H	Degree Heuristic	B	Specifies the allowable combinations of variable values
J	Min-Conflicts Heuristic	C	Every variable is associated with a value
E	Solution to a CSP	D	The values assigned to variables do not violate any constraints
I	Least Constraining Value Heuristic	E	A complete and consistent assignment
A	Domain	F	Nodes correspond to variables, links connect variables that participate in a constraint
B	Constraint	G	Chooses the next variable to expand to have the fewest legal values in its domain
D	Consistent Assignment	H	Chooses the next variable to expand to have the largest number of constraints on other unassigned variables
C	Complete Assignment	I	Prefers to search next the value that rules out the fewest choices for the neighboring variables in the constraint graph
F	Constraint Graph	J	Select the value that results in fewest conflicts with other variables