CSE 5525 Artificial Intelligence II

Homework #2: Markov Decision Process

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1 Markov Decision Processes

Questions:
1) Write out the equations to be used to compute Q_i^* from R, T, V_{i-1}^*, γ and to compute V_i^* from R, T, Q_i^*, γ.

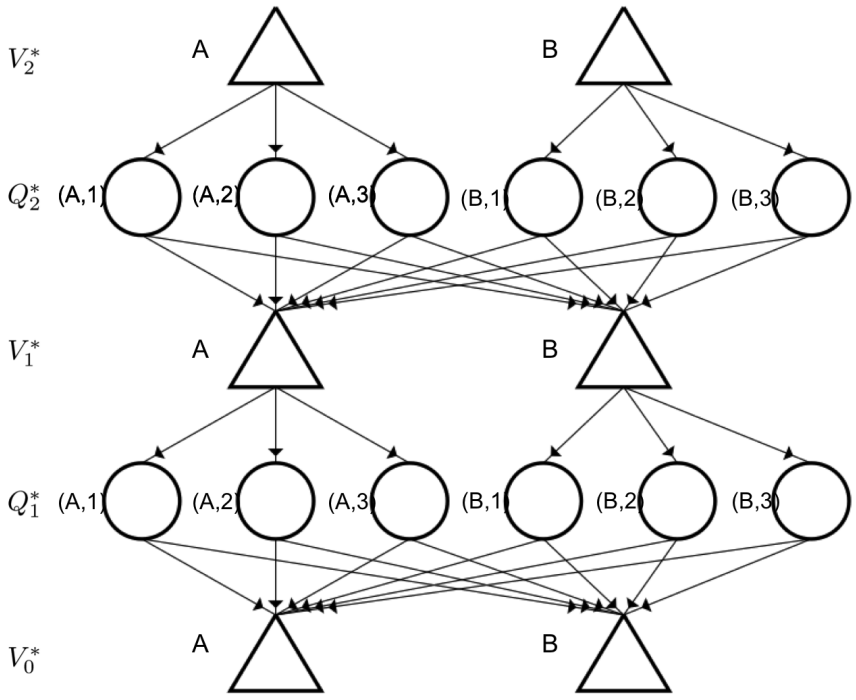
$Q_i^*(s, a) =$

$V_i^*(s) =$

2) Consider the MDP with transition model and reward function as given in the table below. Assume the discount factor $\gamma = 1$, i.e., no discounting. Fill in the values for $V_0^*, V_1^*, V_2^*, Q_1^*, Q_2^*$ in the graph below.

s	a	s'	T(s,a,s')	R(s,a,s')
A	1	A	0	0
A	1	B	1	0
A	2	A	1	1
A	2	B	0	0
A	3	A	0.5	0
A	3	B	0.5	0

s	a	s'	T(s,a,s')	R(s,a,s')
B	1	A	0.5	10
B	1	B	0.5	0
B	2	A	1	0
B	2	B	0	0
B	3	A	0.5	2
B	3	B	0.5	4



3) Let $\pi_i^*(s)$ be the optimal action in state s with i time steps to go. Fill in the following tables:

s	$\pi_1^*(s)$
A	
B	

s	$\pi_2^*(s)$
A	
B	