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CSC 372: Survey of Artificial Intelligence
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5/8/2023

A6: Markov Decision Processes

Solution

Value Iteration Solution:							
Utility function:							
state 12:	2064.28	state 13:	1951.08	state 14:	1805.17	state 15:	1769.52
state 8:	1879.67	state 9:	1865.4	state 10:	1862.15	state 11:	1814.52
state 4:	1728.18	state 5:	1793.24	state 6:	1713.37	state 7:	1746.6
state 0:	1652.76	state 1:	1749.41	state 2:	1643.51	state 3:	1705.35
Optimal Policy:							
state 12:	Left	state 13:	Left	state 14:	Left	state 15:	Up
state 8:	Up	state 9:	Up	state 10:	Left	state 11:	Left
state 4:	Up	state 5:	Up	state 6:	Up	state 7:	Up
state 0:	Left	state 1:	Up	state 2:	Left	state 3:	Up
Policy Iteration Solution:							
Utility function:							
state 12:	2064.28	state 13:	1951.08	state 14:	1805.17	state 15:	1769.52
state 8:	1879.67	state 9:	1865.4	state 10:	1862.15	state 11:	1814.52
state 4:	1728.18	state 5:	1793.24	state 6:	1713.37	state 7:	1746.6
state 0:	1652.76	state 1:	1749.41	state 2:	1643.51	state 3:	1705.35
Optimal Policy:							
state 12:	Left	state 13:	Left	state 14:	Left	state 15:	Up
state 8:	Up	state 9:	Up	state 10:	Left	state 11:	Left
state 4:	Up	state 5:	Up	state 6:	Up	state 7:	Up
state 0:	Left	state 1:	Up	state 2:	Left	state 3:	Up

What I Learned

This assignment helped me understand how Value Iteration and Policy Iteration are implemented in practice, as well as give me a much better idea of the way that Markov Decision Processes can be used to decide actions in environments. It gave me a much better idea of how Markov Decision Processes could be expanded into larger contexts and other purposes, since it clearly has the ability to process complicated situations powerfully.