

USAGE: python Roundy_CSCI3202_Assignment5.py WorldMDP.txt epsilon

I tested a few values of epsilon, however two values in particular gave me different solutions.

Using the default Epsilon of 0.5, I got the results below:

```
user@cu-cs-vm:~/Dropbox/Junior/Artificial-Intelligence/Assignment5$ python Roundy_CSCI3202_Assignment5-2.py WorldMDP.txt 0.5
Updating Utilities....
Utilities Updated!
Determining Path...
Solution Found!
((Location), Utility)
((7, 0), 0.0)
((7, 1), 0.0)
((7, 2), 1.545060192515622)
((7, 3), 1.665060979481193)
((6, 3), 1.979040485096993)
((5, 3), 2.3679854045777526)
((4, 3), 2.675242746124541)
((4, 4), 2.7337159102586996)
((3, 4), 2.5669653543481887)
((3, 5), 2.651891686021669)
((3, 6), 5.7283492360878645)
((3, 7), 6.764943381756983)
((2, 7), 6.5661953847562575)
((1, 7), 7.520027783808349)
((0, 7), 5.819690967782257)
((0, 8), 11.41934249849084)
((0, 9), 50.0)
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```

Using an Epsilon of 1.4, I got new results:

```
user@cu-cs-vm:~/Dropbox/Junior/Artificial-Intelligence/Assignment5$ python Roundy_CSCI3202_Assignment5-2.py WorldMDP.txt 1.4
Updating Utilities....
Utilities Updated!
Determining Path...
Solution Found!
((Location), Utility)
((7, 0), 0.0)
((7, 1), 0.0)
((7, 2), 1.350907322924109)
((7, 3), 1.4613453981654267)
((6, 3), 1.7397734964242162)
((5, 3), 2.087490713227814)
((4, 3), 2.342901370422974)
((4, 4), 2.624536855055852)
((5, 4), 2.314678308677704)
((6, 4), 1.0215343914742938)
((7, 4), 1.0344170960570218)
((7, 5), 1.9231445806593956)
((7, 6), 2.1581501721572036)
((6, 6), 2.580934990374243)
((5, 6), 3.1120063840176706)
((4, 6), 3.6178701227141126)
((3, 6), 5.61093047891576)
((3, 7), 6.637283274036273)
((2, 7), 6.430692760727527)
((1, 7), 7.371115519677655)
((0, 7), 5.621200720767785)
((0, 8), 11.228027808784107)
((0, 9), 50.0)
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```

I believe that the path changes because of the less-strict error bound created with the 1.4 Epsilon value. This allowed for the utility calculation to end before the 0.5 Epsilon value would have causing a change in the world utilities and traveling through a new path. Using a value of 1.3 for Epsilon however, achieved the same path as the 0.5 Epsilon.