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[Unit 5 Reinforcement Learning](#) (2
[Course](#) > [weeks](#))

> [Project 5: Text-Based Game](#) > 5. Parameter Tuning

5. Parameter Tuning

Extension Note: Project 5 due date has been extended by 1 **more** day to **September 6 23:59UTC** .

Effects of adjusting epsilon

0 points possible (ungraded)

Ungrading Note: The problem is now ungraded because there has been a lot of confusion.

In this question, you will investigate the impact of ϵ on the convergence of Q-learning algorithm. Which of the below do you observe from running the algorithm?

☒ For very large ϵ (say $\epsilon = 1$), the algorithm converges slower compared to $\epsilon = 0.5$ ✓

☐ For very large ϵ (say $\epsilon = 1$), the algorithm converges faster compared to $\epsilon = 0.5$

☒ For very small ε (say $\varepsilon = 0.00001$), the algorithm converges slower compared to $\varepsilon = 0.5$

☐ For very small ε (say $\varepsilon = 0.00001$), the algorithm converges faster compared to $\varepsilon = 0.5$ ✓



Solution:

A large value of ε means exploring more (randomly), not using much of what we have learned. A small ε , on the other hand, will generate experience consistent with the current estimates of Q-values, but will explore less. For this toy task, however, the state space is small enough that random initialization is enough to induce diversity in the experience collected.

Submit

You have used 0 of 3 attempts

i Answers are displayed within the problem

Effects of alpha

0 points possible (ungraded)

In this question, you will investigate the impact of α on the convergence of Q-learning algorithm. Fix the exploration parameter $\varepsilon = 0.5$ and do the experiments with different values of the training $\alpha \in [10^{-6}, 1]$. What you have observed?

☒ The algorithm converges for all values of α in less than 200 epochs

☐ The algorithm does not converge for all values of α in less than 200 epochs ✓

☐ The smaller α , the slower the convergence

☒ The smaller α , the faster the convergence



Solution:

For large values of α , learning is too instable. For small values of α , learning is too slow.

Submit

You have used 3 of 3 attempts

i Answers are displayed within the problem

Discussion

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Topic: Unit 5 Reinforcement Learning (2 weeks) :Project 5: Text-Based Game / 5. Parameter Tuning

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For large values of alpha, learning is too instable

1

✓	[staff, please look again] Effects of adjusting epsilon: what I see on the plots is not accepted by the grader Tried to mark also the opposite choice to what I see, and this answer also got rejected.	40 new_ 46
💬	[staff] Ambiguous wording in the "alpha" question. 👤 Community TA	5
?	To the staff: Is convergence to a different limit still considered convergence. Very confusing !!!	14
✓	Which epsilon are is question asking about?	3
?	[staff] Grader issue My answer for the first question was showing as correct, now it shows as wrong, with a mark of 1/1 and 0/3 attempts despite my tries!! I also don't tr...	4
✓	[Staff] Has the correct answer been changed? I got a green tick before the rewording & attempt reset but my formerly-correct answer is now marked wrong. I clicked the submit button again with...	2
💬	Try this for Effects of Adjusting Epsilon I found this very helpful: Reduce the number of epochs to around 30. The distinction between the different values of epsilon becomes a bit clearer.	3
?	Grader problem: Effects of adjusting epsilon @staff Above question got error in both my 2 attempts (i have one more attempt remaining). But i believe my second attempt was correct, can you p...	2
💬	[STAFF] - Effects of adjusting epsilon - What you have observed? The question is **What you have observed?**, but one of the correct options has the opposite of "we observe", and in the second case could be che...	11
?	Effects of alpha: what I see on the plots is not accepted by the grader I assumed that if the algorithm reaches the reward that is not similar to the reward obtained in the previous exercises - it does not converge. Since t...	13
?	[Staff] The criteria for the convergence I have tried alpha=0 and learned something about the converges. But unfortunately, it is not in the range[1e-6,1]. Roughly any curve produced ...	2

