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State-action value function

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1.

Due Mar 10, 11:59 PM CET

1 / 1 point

Which of the following accurately describes the state-action value function $Q(s, a)$?

Try again

- ☒ It is the return if you start from state s , take action a (once), then behave optimally after that.
- ☐ It is the return if you start from state s and repeatedly take action a .
- ☐ It is the return if you start from state s and behave optimally.
- ☐ It is the immediate reward if you start from state s and take action a (once).

Correct
Great!

Your grade
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2.

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You are controlling a robot that has 3 actions: \leftarrow (left), \rightarrow (right) and STOP. From a given state s , you have computed $Q(s, \leftarrow) = -10$, $Q(s, \rightarrow) = -20$, $Q(s, \text{STOP}) = 0$.

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What is the optimal action to take in state s ?

- ☒ STOP
- ☐ \leftarrow (left)
- ☐ \rightarrow (right)
- ☐ Impossible to tell

Correct

Yes, because this has the greatest value.

3.

1 / 1 point

For this problem, $\gamma = 0.25$. The diagram below shows the return and the optimal action from each state. Please compute $Q(5, \leftarrow)$.

100	25	6.25	2.5	10	40
100	0	0	0	0	40
1	2	3	4	5	6

return
action
reward

$Q(5, \leftarrow) = ?$

- ☒ 0.625
- ☐ 0.391
- ☐ 1.25
- ☐ 2.5

Correct

Yes, we get 0 reward in state 5. Then $0 * 0.25$ discounted reward in state 4, since we moved left for our action. Now we behave optimally starting from state 4 onwards. So, we move right to state 5 from state 4 and receive $0 * 0.25^2$ discounted reward. Finally, we move right in state 5 to state 6 to receive a discounted reward of $40 * 0.25^3$. Adding these together we get 0.625.

