Reinforcement Learning
Exercise 7 - Solution

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1 Linear function approximation

a) Tabular linear function approximation

$$\hat{v}(s, w) = \sum_{i=1}^{d} w_i f(x_i)$$

With $f(x_i)$ being a piecewise constant function equal to 1 for $0 < x < 1$.

b) Update rule for Sarsa

1. Tabular case

$$\sum_{i=q}^{d} w_i f(s_{t+1}) = \sum_{i=q}^{d} w_i f(s_t) + \alpha[R_{t+1} + \gamma(\sum_{i=q}^{d} w_i f(s_{t+1})) - \sum_{i=q}^{d} w_i f(s_t)]$$

2. Function approximation

$$\sum_{i=q}^{d} w_i x_i(s_t) = \sum_{i=q}^{d} w_i x_i(s_t) + \alpha[R_{t+1} + \gamma(\sum_{i=q}^{d} w_i x_i(s_{t+1})) - \sum_{i=q}^{d} w_i x_i(s_t)]$$

3. Linear function approximation

2 Mountain Car

TODO: