

## Monte Carlo Prediction Algorithm

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**Algorithm 1** Monte Carlo Prediction

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1: Initialize:  $\forall s \in \mathcal{S}, \hat{V}(s) \leftarrow 0, N(s) \leftarrow 0$ 
2: for  $k = 1, 2, \dots, K$  do
3:   Generate an episode following policy  $\pi$ :  $S_0, A_0, R_1, \dots, S_T$ 
4:    $G \leftarrow 0$ 
5:   for  $t = T - 1, T - 2, \dots, 0$  do
6:      $G \leftarrow \gamma G + R_{t+1}$ 
7:     if  $S_t$  not in  $S_0, S_1, \dots, S_{t-1}$  then
8:        $N(S_t) \leftarrow N(S_t) + 1$ 
9:        $\hat{V}(S_t) \leftarrow \hat{V}(S_t) + \frac{1}{N(S_t)}(G - \hat{V}(S_t))$ 
10:    end if
11:  end for
12: end for
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