

This is the same as checking if:

$$\vec{w} \cdot \vec{\phi}(\text{the,dog,barks,loudly, 4, VB, ADV}) > \vec{w} \cdot \vec{\phi}(\text{the,dog,barks,loudly, 4, VB, VB})$$

$$\vec{\phi}(\text{the,dog,barks,loudly, 4, VB, ADV})$$

↓	
1	← $s_i = \text{ADV}$ and x_i ends in “-ly” →
1	← $s_i = \text{ADV}$ and $s_{i-1} = \text{VB}$ →
0	← $s_i = \text{VB}$ and $s_{i-1} = \text{VB}$ →
0	← $s_i = \text{NN}$ and $s_{i-1} = \text{VB}$ →
0	← $s_i = \text{VB}$ and $x_i = \text{loudly}$ →
0	← $s_i = \text{NN}$ and $x_i = \text{loudly}$ →
0	← $s_i = \text{DET}$ and $x_i = \text{loudly}$ →
1	← $s_i = \text{ADV}$ and $x_i = \text{loudly}$ →

$$\vec{\phi}(\text{the,dog,barks,loudly, 4, VB, VB})$$

↓	
0	
0	
1	
0	
0	
0	
1	
0	

$$\vec{w}$$

↓	
3	
2	
-2	
-2	
-4	
-5	
-5	
3	

frequent events get positive weights after training while infrequent events get negative (or close to zero) weights.

$$\vec{w} \cdot \vec{\phi}(\text{the,dog,barks,loudly, 4, VB, ADV}) = 1 * 3 + 1 * 2 + 1 * 3 = 6$$

$$> \vec{w} \cdot \vec{\phi}(\text{the,dog,barks,loudly, 4, VB, VB}) = 1 * -2 + 1 * -5 = -7$$