## Computation process for $v_3(3)$

$v_1 = \{8.85e^{-7}, 0, 0, 0, 0, 0, 0\}$

$v_2 = \{0, 3.0e^{-9}, 2.23e^{-14}, 0, 1.03e^{-11}, 0, 0\}$

$v_3(3) = max((v_2(y_0) * P(\text{VB}|y_0) * P('back'|\text{VB}), y_0 \in \{NNP, MD, VB, JJ, NN, RB, DT, <\text{s}>\})$

$v_3(3) = max(\{0, 0, 1.6e^{-12}, 7.50e^{-20}, 0, 9.73e^{-18}, 0, 0\})$

$v_3(3) = 1.61e^{-12}$

## Computation process for $v_4(7)$

$v_1 = \{8.85e^{-7}, 0, 0, 0, 0, 0, 0\}$

$v_2 = \{0, 3.0e^{-9}, 2.23e^{-14}, 0, 1.03e^{-11}, 0, 0\}$

$v_3 = \{0, 1.61e^{-12}, 5.11e^{-16}, 5.36e^{-16}, 5.33e^{-12}, 0, 0\}$

$v_4(7) = max((v_3(y_0) * P(\text{RB}|y_0) * P('the'|\text{RB}), y_0 \in \{NNP, MD, VB, JJ, NN, RB, DT, <\text{s}>\})$

$v_4(7) = max(\{0, 0, 1.82e^{-13}, 9.30e^{-19}, 1.84e^{-18}, 1.29e^{-13}, 0, 0\})$

$v_4(7) = 1.82e^{-13}$