Hidden Markov Models

1. Suppose the HMM considered in Example 1 generates the observations:

\[ O = Y, R, Y, R \]

at sample times \( t = 0, 1, 2, 3 \), respectively. Find the probability \( Pr(O|\lambda) \) using the forward-backward algorithm. You may do this problem by hand or on a computer. Show the values of the forward variable over time.

2. Find the most likely state sequence for the observation in part 1 using the Viterbi algorithm. This is probably most easily done by hand. Show your calculations.