HMM Example

Consider a HMM for predicting hot and cold weather based on observed number of ice creams eaten. Let and . The HMM is given as

State transition matrix,

0.7 0.3  
0.4 0.6

Also,

Emission probability matrix,

0.2 0.6  
0.4 0.3  
0.4 0.1

Find the best labels for the ice cream sequence 3,2,3,1.

0.6\*0.4 = 0.24, 0.4\*0.1 = 0.04

max[0.24\*0.7\*0.4, 0.04\*0.4\*0.4] = 0.0672 (prev state 1)

max[0.24\*0.3\*0.4, 0.04\*0.6\*0.4] = 0.0288 (prev state 1)

max[0.0672\*0.7\*0.4, 0.0288\*0.4\*0.4] = 0.0188 (prev state 1)

max[0.0672\*0.3\*0.1, 0.0288\*0.6\*0.1] = 0.0024 (prev state 1)

max[0.0188\*0.7\*0.2, 0.0024\*0.4\*0.2] = 0.0026 (prev state 1)

max[0.0188\*0.3\*0.6, 0.0024\*0.6\*0.6] = 0.0034 (prev state 1)

Termination

Max[0.0026\*0.5, 0.0034\*0.5] = 0.0017 (prev state is 2)

Therefore, best labels for 3,2,3,1 is H, H, H, C