Intelligent Autonomous Agents and Cognitive Robotics
Exercise Sheet 6

This time only two questions
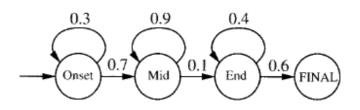
1. For the DBN of exercise 5 question 5 and for the evidence values
   - e_1 = not red eyes, not sleeping in class
   - e_2 = red eyes, not sleeping in class
   - e_3 = red eyes, sleeping in class

   perform the following computation:
   a. Smoothing: $P(EnoughSleep_t| e_{1:3})$ for each of t=1,2,3
   b. Compare the filtered and smoothed probabilities for t=1 and t=2.

2. The following network represents the detection of the phone [m]. As you can see the states can produce different outputs (which are encodings for tones) with different probabilities. Calculate the most probable path for the following network and the output sequence using context information. (C1, C2, C3, C4, C4, C6, C7). Also give the total probability of the observation sequence.

Output probabilities for the phone HMM:

Onset:	Mid:	End:
C_1: 0.5	C_3: 0.2	C_4: 0.1
C_2: 0.2	C_4: 0.7	C_6: 0.5
C_3: 0.3	C_5: 0.1	C_7: 0.4