

LING3804: Problem Set 2

Due via Carmen dropbox at 11:59 PM 2/9.

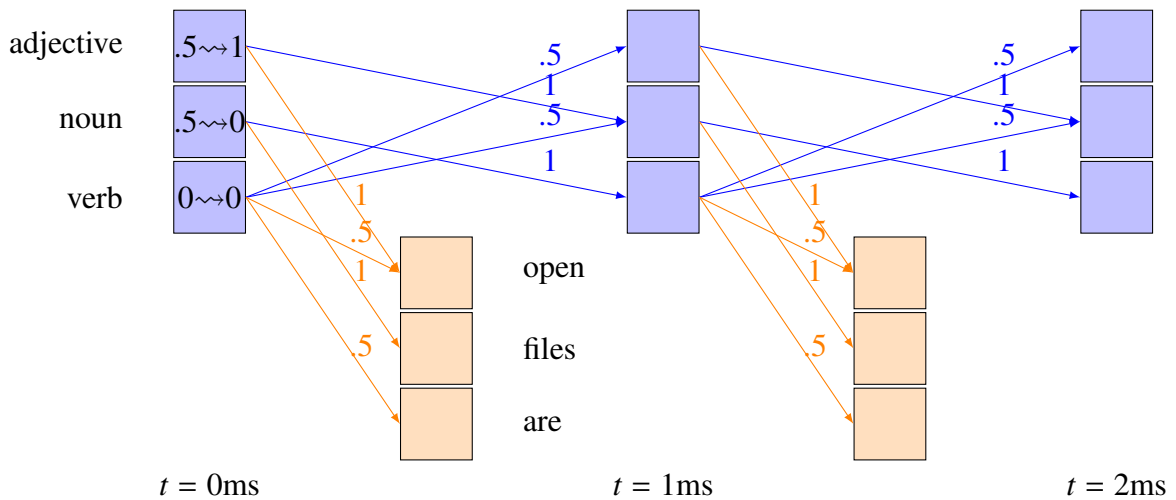
1. Assuming a fair die, solve the equations:

- (a) [2 pts.] $P(1) = \underline{\hspace{2cm}}$
- (b) [2 pts.] $P(\{1, 2\}) = \underline{\hspace{2cm}}$
- (c) [2 pts.] $P(\text{a number less than or equal to } 4) = \underline{\hspace{2cm}}$
- (d) [2 pts.] $P(\{1, 2\} \mid \{1, 3, 4, 5\}) = \underline{\hspace{2cm}}$
- (e) [2 pts.] $P(\text{an odd number} \mid \text{a number less than or equal to } 4) = \underline{\hspace{2cm}}$

2. Assuming a fair die and a fair coin, solve the equations:

- (a) [2 pts.] $P(\langle 1, \text{heads} \rangle) = \underline{\hspace{2cm}}$
- (b) [2 pts.] $P(\{\langle 1, \text{heads} \rangle, \langle 2, \text{heads} \rangle\}) = \underline{\hspace{2cm}}$
- (c) [2 pts.] $P(\{\langle 1, \text{heads} \rangle, \langle 2, \text{heads} \rangle\} \mid \{\langle 1, \text{heads} \rangle, \langle 2, \text{heads} \rangle, \langle 1, \text{tails} \rangle, \langle 2, \text{tails} \rangle\}) = \underline{\hspace{2cm}}$
- (d) [2 pts.] $P(\{\langle 1, \text{heads} \rangle, \langle 2, \text{heads} \rangle\} \mid \{\langle 1, \text{heads} \rangle, \langle 2, \text{heads} \rangle\}) = \underline{\hspace{2cm}}$
- (e) [2 pts.] $P(\{\langle 1, \text{heads} \rangle, \langle 2, \text{heads} \rangle\} \mid \{\langle 1, \text{heads} \rangle\}) = \underline{\hspace{2cm}}$

3. [10 pts.] Finish sampling through the below unrolled hidden Markov model:



4. [10 pts.] Suppose you have cue and target mental states characterized by the below patterns of cortical activation. What synaptic weights result from long-term potentiation of the cue state

