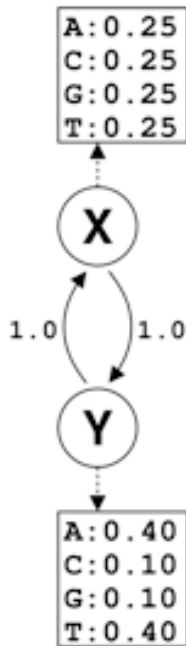


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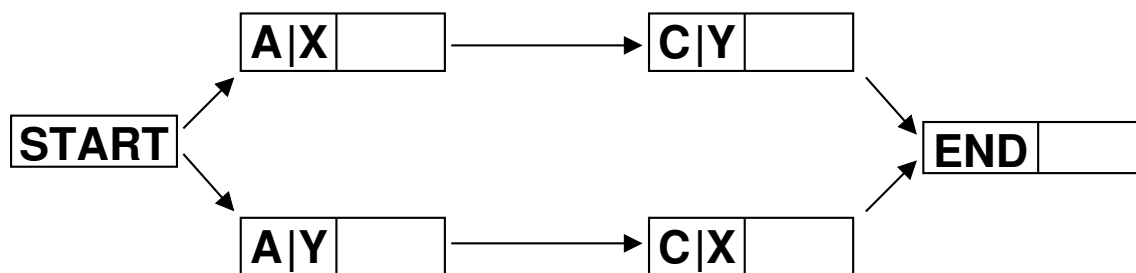
Complementary Homework 8

This homework will not be collected or graded, but its contents and the papers to read may be relevant in an upcoming lecture, test or assignment.

1. Explain the following terms about HMMs: (a) transition probability, (b) emission probabilities, (c) emitting states, and (d) silent states.
2. You have a hidden Markov model with two states X and Y:



- (a) Add a silent start state S leading with equal probability to X and Y.
- (b) Write down the transition and emission probabilities.
- (c) Perform the Viterbi algorithm for the emitted string AC:



After computing the probabilities, mark the Viterbi path through the diagram. What is its probability to have produced AC?

3. (a) Explain why the fan-shaped diagram, that noted down all possible paths through the fair-bet-casino HMM given to produce the given string, could be reduced to the linear form.
 (b) Why does this not work for the fan-shaped diagram in the example with the blue and red marbles without replacement?