X

Week 9 : Assignment 9

Assignment not submitted **Due date: 2023-09-27, 23:59 IST.**

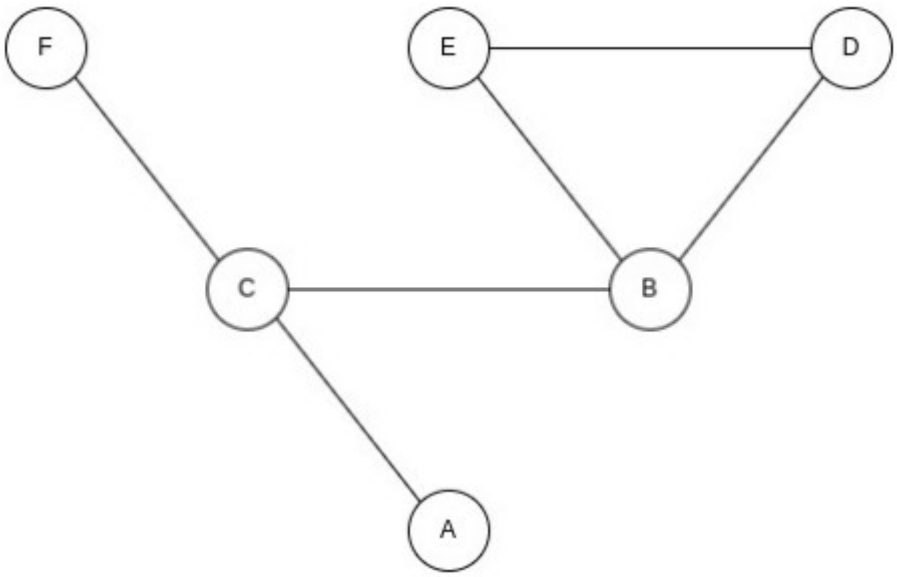
1) Which of the following best describes the Markov property in a Hidden Markov Model (HMM)? ***1 point***

- The future state depends on the current state and the entire past sequence of states.
- The future state depends only on the current state and is independent of the past states, given the current state.
- The future state depends on the past states and the future states, given the current state.
- The future state depends only on the past states and is independent of the current state.

2) Statement 1: Probability distributions are valid potential functions. ***1 point***
Statement 2: Probability is always strictly positive.

- Statement 1 is true. Statement 2 is true. Statement 2 is the correct reason for statement 1.
- Statement 1 is true. Statement 2 is true. Statement 2 is not the correct reason for statement 1.
- Statement 1 is true. Statement 2 is false.
- Both statements are false.

3) In the undirected graph given below, which nodes are conditionally independent of each other given B? Select all that apply. ***1 point***



- ☐ C, D
- ☐ D, E
- ☐ E, C
- ☐ A, F
- ☐ None of the above

4) Given graph below: ***1 point***

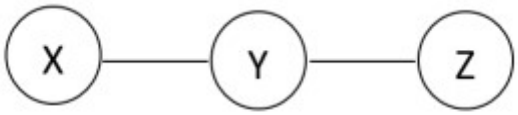
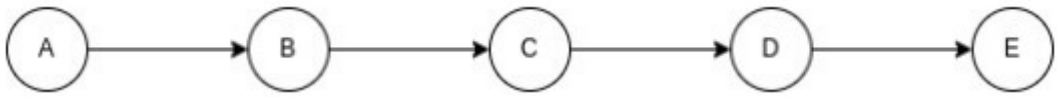


Figure 1

Factorization is:

- ○ $p(x,y,z) = p(x)p(y|x)p(y|z)$
- ○ $p(x,y,z) = p(y)p(x|y)p(z|y)$
- ○ $p(x,y,z) = p(z)p(z|y)p(x|y)$
- ○ $p(x,y,z) = p(y)p(y|x)p(y|z)$

5) For the given graphical model, what is the optimal variable elimination order when trying to calculate P(E=e)? ***1 point***



- ○ A, B, C, D
- ○ D, C, B, A
- ○ A, D, B, C
- ○ D, A, C, A

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6) Which of the following methods are used for calculating conditional probabilities? ***1 point***
(more than one may apply)

- [ ] Viterbi algorithm
- [ ] MAP inference
- [ ] Variable elimination
- [ ] Belief propagation

7) In the undirected graph given below, which nodes are conditionally independent of each other given a single other node (may be different for different pairs)? Select all that apply. ***1 point***

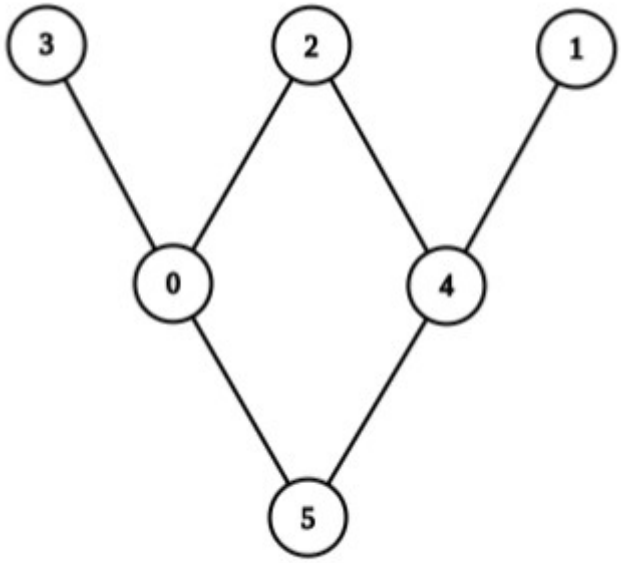

Figure 2

- [ ] 3, 2
- [ ] 0, 4
- [ ] 2, 5
- [ ] 1, 5

You may submit any number of times before the due date. The final submission will be considered for grading.

Submit Answers