EECS 491 - Probabilistic Graphical Models
Assignment 3

In this assignment you'll develop a larger graphical model. The goal of this assignment is to model a specific domain and use general packages to perform inferences for queries that involve different subsets of evidences and query variables, also different values of evidence. Your model should be sufficiently large that includes some non-evidence variables that important to this structure of model but aren't related to the query. For example, in the 'Diagnosis of Dyspnea', we do the inference of 'lung cancer' (L) with given evidence of 'been to Asia' (A) and has symptom of 'Dyspnea' (D), with 5 non-evidence variables. Your goal should be to show how the model can be used to perform deductive inference which resolve uncertainty among alternative hypothesis with additional evidence.

Your model can use discrete or continuous variables (or both). You should use and contrast the different inference methods we have discussed: belief propagation and Monte Carlo sampling. You are encouraged to explore different packages for constructing your model, but feel free to use the notebooks include your last assignment as a starting point.

Important Dates
- Mon Mar 19 - Group discussions. Discussion summaries are due by midnight.
- Mon Mar 26 - Group presentations.
- Wed Mar 28 - Final notebooks are due before midnight. Submit all notebooks (or pdfs) to Canvas.
- Mon Apr 2 - Peer evaluations are due before noon.

Requirements
- You are required to use git to manage your code and notebook and make commits regularly to show your progress. You must make a submission of your code and notebooks to canvas before each group discussion, group presentations, and the final due date.
- Use one jupyter notebook (or latex-generated pdf file) per exercise.
- Each notebook should include all necessary text, math, code, and results for clearly explaining your work to others. In addition to submitting the notebooks (the .ipynb files) you should also submit the export of the notebook to a pdf file.
- If you are using a language that does not support jupyter, you must create a pdf notebooks using latex. Use separate pdfs for each notebook.
- After the discussion session, you should submit your feedback to others' work on canvas in their submission page.

Group Discussions
The goal of this discussion is for each member of the group to have a clear idea of how to approach all the exercises in the assignment. You are free to ask any questions and offer any help that helps toward completing the assignment. A good outcome would be for everyone to have gotten a good start on the first two exercises.

Group Presentations
Each member of the group will have 7-8 min to present their notebooks to the other members of the group. Group members should take notes on each presentation for peer review of the final submission (due the following Monday via Canvas). Students are expected to use the feedback from the group to improve their notebooks before final submission. An group selected moderator will ensure that everyone stays within the time limits and that feedback is constructive.

Peer Evaluations
Group members are responsible for evaluating each of the other group members on completeness, clarity and depth understanding, correctness, thoroughness, and creative exploration. As well as a brief summary. Criteria are scored on a scale of 0-3. Details are in the rubric.