

Bayesian Models CSE458
Assignment 1

Write a program which allows a user to read in a Bayesian Network, with a singly connected structure, and to perform Bayesian inference on the structure using the algorithm given in "Learning Bayesian Networks".

Your program needs to be able to perform the following tasks:

- *Read a Bayesian Network from a text file.*
- *List the nodes in the network.*
- *Display the conditional probability table for each node.*
- *Display the current belief distribution for each node.*
- *Set evidence.*
- *Clear evidence.*
- *Update beliefs.*
- *Display all λ and μ messages, together with suitable comments, for debugging belief updating.*

INSTRUCTIONS

- You may use any programming language for your implementation, as long as you provide the source code and a Makefile to build an executable version which will run on Linux.
- You **must** describe how to run your program in a README file and document your code.
- You **must** provide the following example input files:
 1. A Bayesian Network corresponding to the Oil Drilling Problem on Exercise Sheet 3.
 2. A Bayesian Network corresponding to the Alarm network given in lectures, (a copy is available via the courseware page).
 3. A Bayesian Network corresponding to the Mendel Genetics Network provided with Netica, (a copy is available via the courseware page).
- For submission, please put your files (source, Makefile, and input files) in a directory called **CSE458-Ass1-loginId** then tar and zip this directory and email it to me.

MARKING SCHEME

Usability (installation, documentation, code readability).	10%
Works for the Test Example 1.	20%
Works for the Test Example 2.	30%
Works for my own Test Example (Tree structure).	20%
Works for Test Example 3.	10%
Works for my own Test Example (Singly connected structure).	10%

Note a program that only works for tree structures can get a maximum of 80% of the total marks.