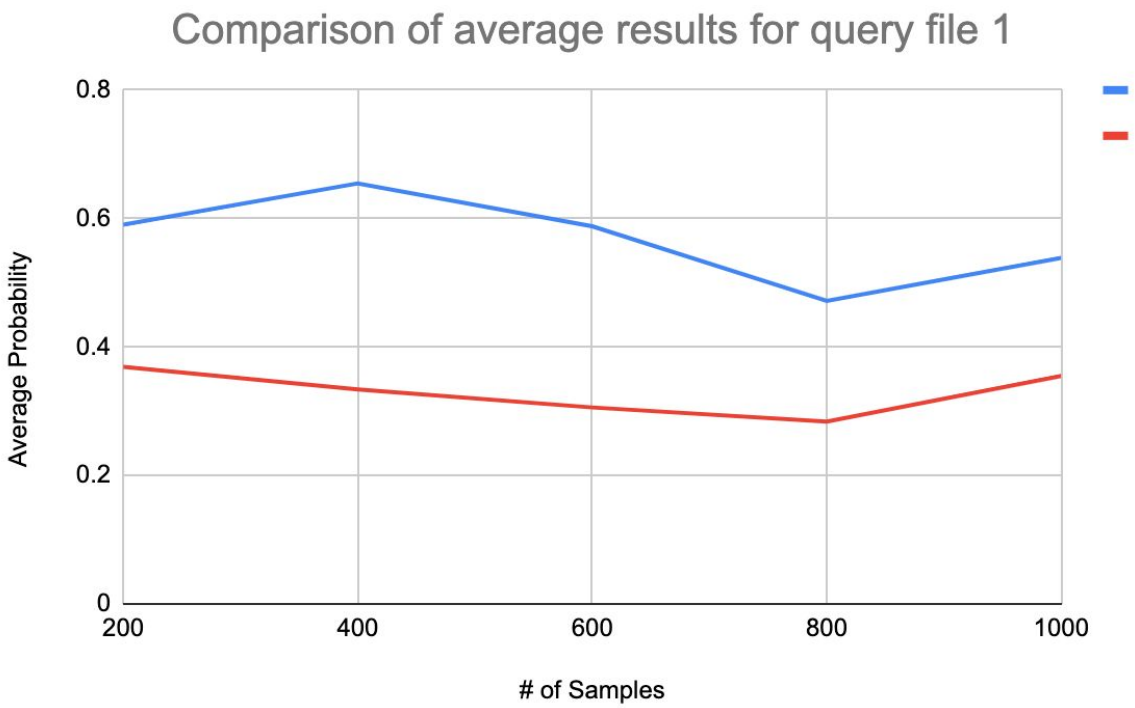
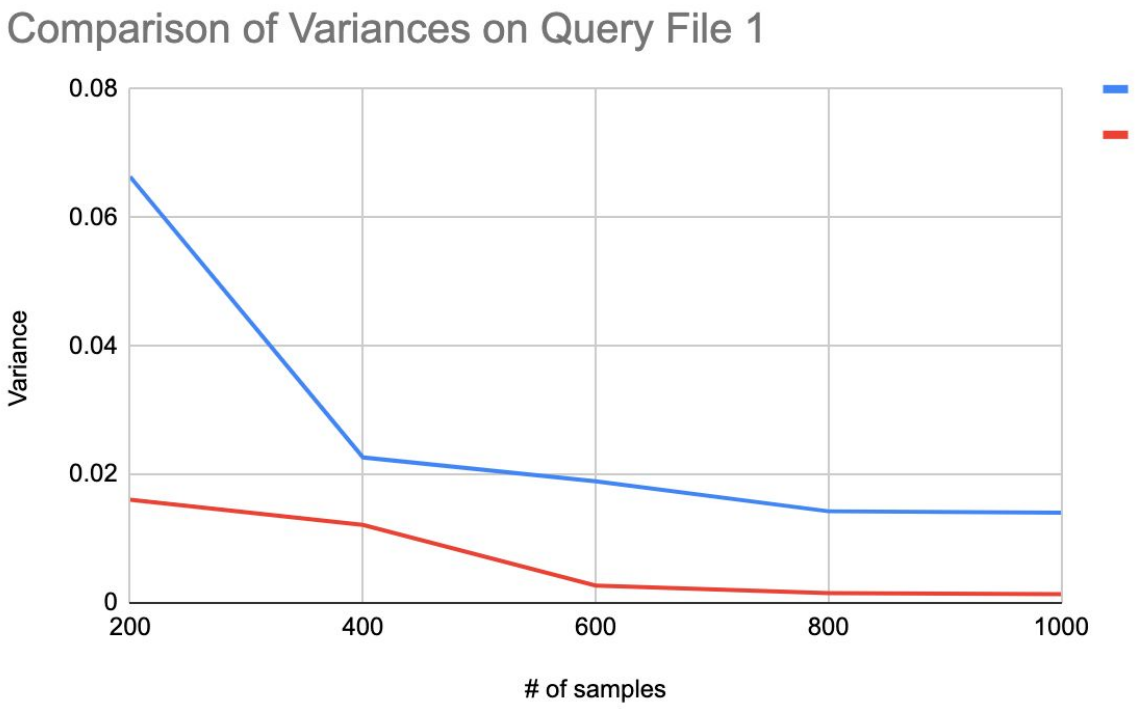
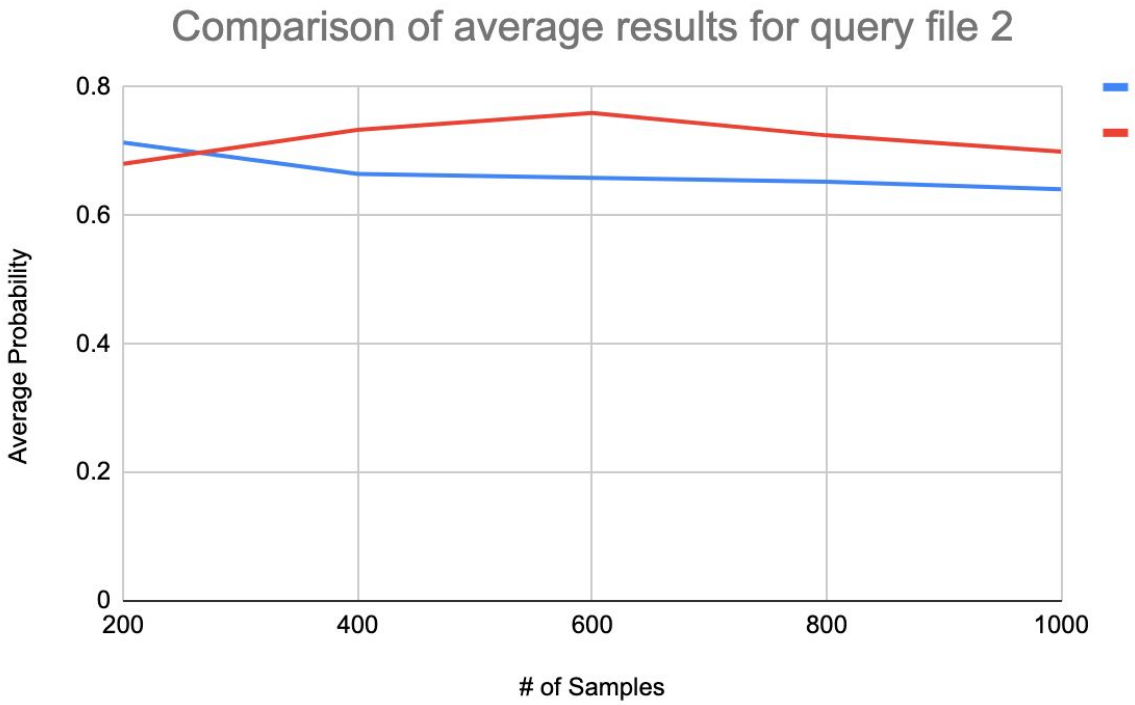
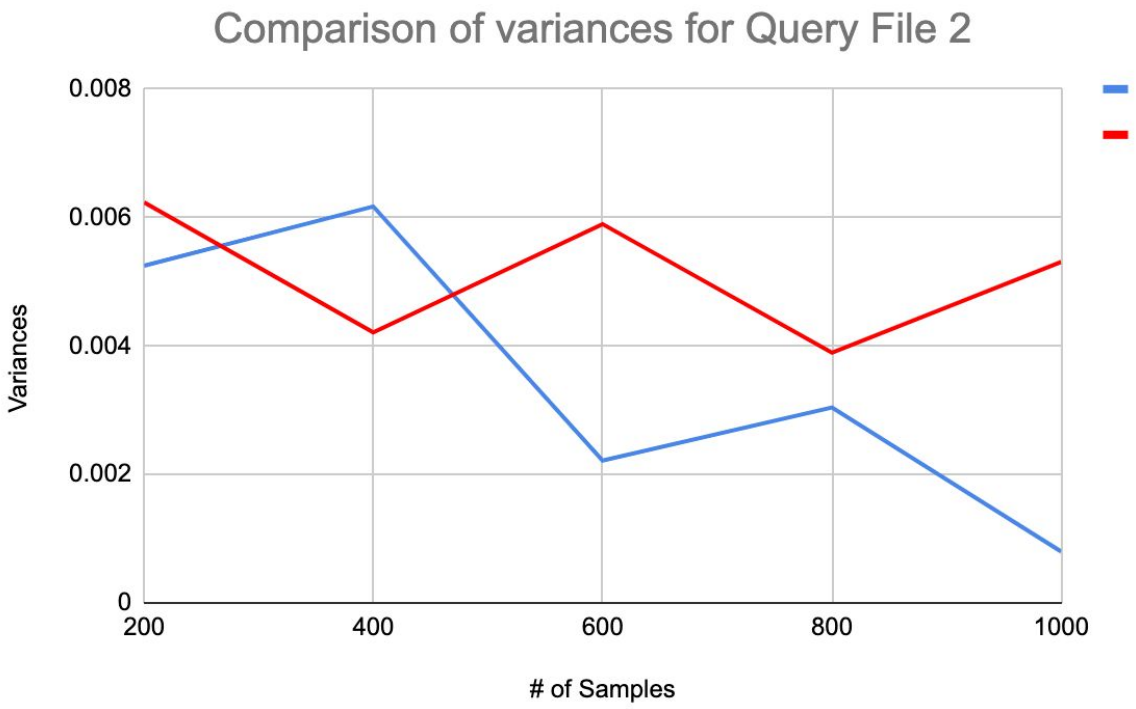
AI Project 6 Write-up
Robert Dutile & Myo Min Thant

1. Data:
   Legend: Blue is rejection sampling, red is likelihood weighted.




Comparison of Variances on Query File 1
0.08
0.06
0.04
0.02
0
Variance
200
400
600
800
1000
# of samples


Comparison of average results for query file 2
0.8
0.6
0.4
0.2
0
Average Probability
200
400
600
800
1000
# of Samples



2. Convergence

   For query file 1, if we look at the comparison of the variances of the two algorithms, we can see that those two algorithms are converging with more samples and likelihood weighting algorithm seems to perform much better, and faster with lower variance on every sample size we tested. Also they both are converging in the range of 0.1 and 0.01.

   For query file 2, we cannot determine quite surely from the sample sizes we have tested. Likelihood weighting seems to converge much slower on the query file 2 than rejection sampling does. The bigger the sample size, the lower the variance of rejection sampling. However, if we look at the numbers, they are converging in the range of 0.01 and 0.001 which is much lower and better than the results from query file 1.

   For both query files, we do not notice a point where both algorithms totally converge. However, with bigger sample size, both algorithms could converge towards a probability on both query files.

Note: if you want the experimental data that we use to compare the two algorithms, you can look it up on this spreadsheet.
https://docs.google.com/spreadsheets/d/1xg2ayl2uUwp9tL8zHljgOqdqT8RPwIn6eyHLk5-jSRU/edit?usp=sharing

3. README

The readme file is in the root of the project folder BayesianNetworks, labeled README.txt.