

### Small Problem 7: Friends and Smokers

**Query 1:** For each of the unobserved nodes, the marginal posterior probability that that person is a smoker.

**Metric 1:** The sum, over all of the queried nodes, of the absolute difference between the computed and the true posterior probability

**Ground Truth:** The spreadsheet “problem-7-solution.xlsx” (without headers in the .csv version) contains the true posterior probability that a person is a smoker computed for each unobserved node (and for the given observed nodes).

**TODO:** Compute Metric 1 using the ground truth.

Submit the metric and your code as described in the main CP4 problem description document, e.g. PPAML Challenge Problem 4-v7.pdf.

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#### Ground Truth Details:

Given the Markov Random Field (MRF) and the observation data, the marginal posterior probability that a person is a smoker (for each of the unobserved nodes) was computed using a Gibbs sampler.

A comparative version of the Gibbs sampler used for computation of the ground truth is included in the R-code that was part of the CP4 small problems tar file (problem-7-generator.R).