# Small Problem 10: Lifted Inference

**Given:**

A probabilistic program directly implementing the generative model:

;

for all in

, if ,

, if not

**Find:**

Query: The exact value of . Here, returns the cardinality of the set.

**Metric:**

Time required to answer the query for values of

Instead of a performance profile for each of these values, please submit a single CSV file named “problem-10-metrics.csv” with three columns: , , and running time (in seconds with decimal fraction) of your solution.

Note that ideal running time should scale as