Probabilistic programs need probabilistic assertions.

**assert** *e, p, c*: Expression *e* is true with at least probability *p* at confidence level *c*.

The concrete (ordinary) semantics are nondeterministic.

A symbolic semantics captures a program’s probabilistic behavior.

The expression dag output from distribution extraction is a Bayesian network, a representation of probability distributions that lets statistical properties act as optimizations.

Optimizations collapse the network to a Bernoulli and we verify the assert exactly.

**OR**

Sample the network and perform a hypothesis test to get a statistical guarantee.

Our verifier checks asserts 24x faster than a naive checker on average.