Monte Carlo methods vary, but tend to follow a particular pattern:

1. Define a domain of possible inputs
2. Generate inputs randomly from a [probability distribution](https://en.wikipedia.org/wiki/Probability_distribution) over the domain
3. Perform a [deterministic](https://en.wikipedia.org/wiki/Deterministic_algorithm) computation on the inputs
4. Aggregate the results

MC methods are computationally expensive, but for models without a clear path to an analytical solution still offer a way to get arbitrarily close to an analytical solution.

Common Uses:

Integration (Metropolis Hastings)

Simulation and Optimization

[Inverse Problems](https://en.wikipedia.org/wiki/Inverse_problem): Instead of selecting from input distributions to explore outcomes, you can instead

Sage uses

Distribution Selection:

* Initial Conditions
* Initial Parameters
* Continuous Selection
  + Path Dependence (Results affected by path from V(t=0) to V(t=t) eg options pricing)
  + State independent: reselecting from the same distribution at different times
  + State Dependent: t+1 selects from a distribution determined by t. Can be discrete time, (Markov chains), or continuous (CTMC)
  + State Dependence

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