

The output of our particle filter inference algorithms is a Monte Carlo estimate of the posterior density and posterior means of the hidden states \mathbf{x}_k given all of the observed price observations $(y_{1:T})$ up to the current observation time T .

These posterior probability density can in principle be carried forward into optimal decision-making processes about whether to buy or sell the underlying asset. However, this is a relatively complex process with many detailed implementation details. As the main focus of this project is on the inference process rather than the final profitability of the trading algorithm, we adopt a more simplistic approach whereby we generate buy and sell decisions (or “*trading signals*” in trading terminology) using solely the posterior mean outputs $\hat{\mathbf{x}}_k = \mathbb{E}(\mathbf{x}_k|y_{1:k})$ of the particle filter.

One method of generating a trading signal

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