1. GOAL:

   The goal is to used the Dempter-Shafer Theory (DST) to combine the data from multiple sources of information to obtain a competitive advantage in entering/exiting positions in the market over other traders. The strategy uses a mass function that encapsulates data from an exponential moving average (EMA) and a mass function encapsulating data from bid/ask and bid/ask sizes. We combine the mass functions of these two sources of information using Depster's rule of combination to obtain a better idea of what our position should be than just using either of them individually.

2. VARIABLES

   The strategy can be market agnostic (stocks, options, futures etc.). As the example we will use a stock.

   i = The possible percentage changes in our position we will allow
   AD_i = The event that we decrease position by i%
   AI_i = The event that we increase position by i%
   I = The event that we are unsure about our next move
   This event is the union of all AD_i and AI_i
   E = The set of all events, that is, the union of AD_i, AI_i and I. E is ordered as
   $=\{AD_{10}, AD_8, \cdots, AD_2, AD_0, AI_2, \cdots, AI_8, AI_{10}, I\}$
   $m_1(E)$ = Mass function for EMA information. $m_1 : E \to [0, 1]$
   $m_2(E)$ = Mass function for the bid/ask information. $m_2 : E \to [0, 1]$
   $M(E)$ = Fused mass function. $M : E \to [0, 1]$
   D = Decision on what next move is. Will be one of E
   κ = Degree of conflict

3. EQUATIONS (Dempster's Rule of Combination)

$$\kappa = \sum_{E_i \cap E_j = \emptyset} (m_1(E_i) m_2(E_j))$$

$$K = \frac{1}{1 - \kappa}$$

$$M(A) = K \sum_{E_i \cap E_j = A} m_1(E_i) m_2(A_j)$$

4. STRATEGY: We will construct mass functions for each financial indicator we think provides information about movements in the markets. Note that these mass functions must be on the same event space. We then apply Dempster's rule of combination in (3) to obtain the fused mass function $M(\cdot)$. Note that $M : E \to [0, 1]$, so it will also be on the same event space. We look at the values of $M(\cdot)$ and find the one that has the highest mass assigned to it. We pick $D = E_{\max \text{ mass}}$, that is, the event with the highest fused mass assigned to it. We follow the decision D.