Suppose you are the only player in a card game whose rules are as follows: from a deck of 100 face-down cards, a dealer turns up one card at a time. Each card is labeled by some positive integer, but no information is available on the range or distribution of these labels. Every time a card is dealt (and its label shown to you), you will be asked if you would like to “take” or “pass” it. You can only take one card during the entire game, but never a card that you previously passed. To win the game, you have to have taken a card with the largest of all labels. Although, this appears to be a game of very low chance to win, there is a rather simple strategy that will allow you to win more than 25% of the time! Find such a strategy.

Answer:

Pass the first 50 cards, but remember the highest value among them. Take the first card of the remaining 50 cards which meets or exceeds that highest value. You will definitely win if the second highest card is in the first half of the deck and the highest card in the second half. The probability for that to happen equals $\frac{50}{100} \times \frac{50}{99} > 25\%$. 