Learning and Predicting price changes in financial markets:

An oil market study with Japanese Candle Sticks

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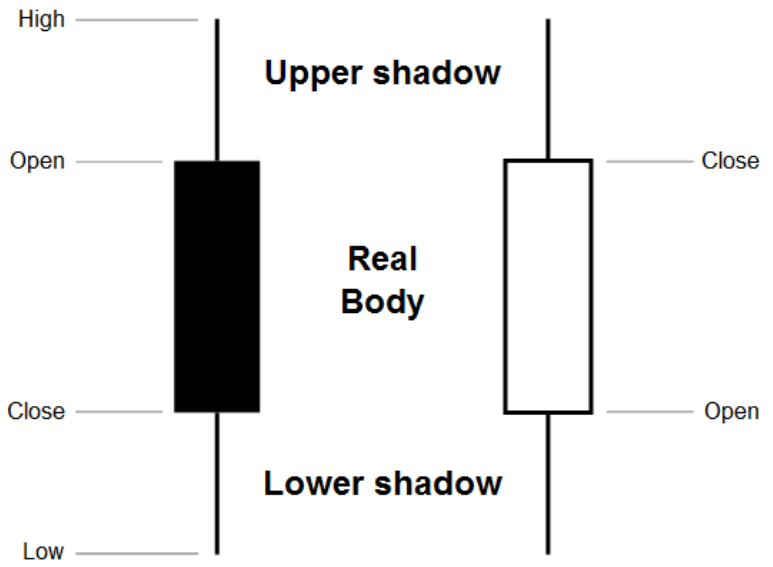
Introduction

- In order to visualize the sessional variation in prices, the prices were displayed in a *candlestick* pattern.

The area between the open and the close is called the *real body*, price excursions above and below the real body are called *shadows*. The wick illustrates the highest and lowest traded prices of a security during the time interval represented. The body illustrates the opening and closing trades.

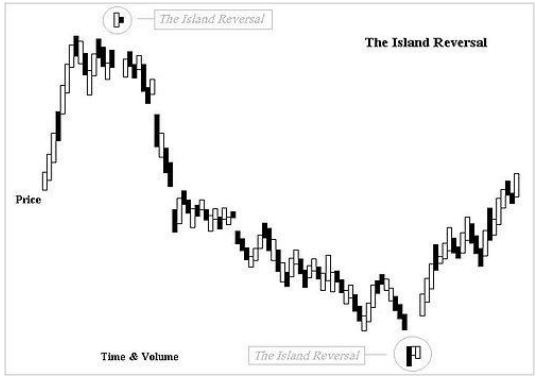


http://en.wikipedia.org/wiki/File:Candle_definition_en.svg

Introduction

- There are many patterns that are found more frequently than others. The *heads and shoulders pattern* occurs during price reversals and shows declining trends.

- There are trends that are hard to discern like the i*sland reversal* – where there is a gap in the pattern after which a trend starts.



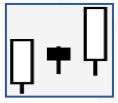
http://en.wikipedia.org/wiki/Head_and_shoulders_(chart_pattern)

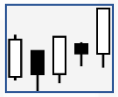
Contribution

- Given a historic time series, my program can create a library of these patterns and note their frequency. The frequency can be used to assign a probability of occurrence.
- My program can also compute the probability of the co-occurrence of two patterns within a specified period of time.
- In effect, my program *learns* the behaviour patterns, and outputs a frequency of occurrence that has been learnt.

Design & Analysis

- 1 = white candle, 0 = black candle.
- 1":"0" = 60:40 in dataset used (there were more days where the price rose).
- Analysis of sample patterns:

 After "101" (85116 times) "1":"0" = 60:40

 After "10101"(19591 times "1":"0" = 59 : 41

- **However**, some patterns were:

 After "11111" (20533 times) "1":"0" = 70:30