Ichimoku

September 29, 2021

1 Ichimoku Kinko Hyo (AKA Ichimoku Cloud)

https://www.investopedia.com/terms/i/ichimokuchart.asp

[1]:
```
import numpy as np
import matplotlib.pyplot as plt
import pandas as pd

import warnings
warnings.filterwarnings("ignore")

# fix_yahoo_finance is used to fetch data
import fix_yahoo_finance as yf
yf.pdr_override()
```

[2]:
```
# input
symbol = 'AAPL'
start = '2016-01-01'
end = '2019-01-01'

# Read data
df = yf.download(symbol,start,end)

# View Columns
df.head()
```

```
[*********************100%***********************]  1 of 1 downloaded
```

[2]:
```
                  Open        High         Low       Close  Adj Close  \
Date
2016-01-04  102.610001  105.370003  102.000000  105.349998  99.499107
2016-01-05  105.750000  105.849998  102.410004  102.709999  97.005730
2016-01-06  100.559998  102.370003   99.870003  100.699997  95.107361
2016-01-07   98.680000  100.129997   96.430000   96.449997  91.093399
2016-01-08   98.550003   99.110001   96.760002   96.959999  91.575073

              Volume
Date
```

```
2016-01-04  67649400
2016-01-05  55791000
2016-01-06  68457400
2016-01-07  81094400
2016-01-08  70798000
```

Tenkan-sen - The tenkan-sen, or conversion line, is calculated by adding the highest high and the highest low over the past nine periods and then dividing the result by two. The resulting line represents a key support and resistance level, as well as a signal line for reversals.

[3]:
```
# First Create Tenkan_Sen
high_9 = df['High'].rolling(9).max()
low_9 = df['Low'].rolling(9).min()
df['Tenkan_Sen'] = (high_9 + low_9) /2
```

Kijun-sen - The kijun-sen, or base line, is calculated by adding the highest high and the lowest low over the past 26 periods and dividing the result by two. The resulting line represents a key support and resistance level, a confirmation of a trend change, and can be used as a trailing stop-loss point.

[4]:
```
# Second Create Kijun Sen
high_26 = df['High'].rolling(26).max()
low_26 = df['Low'].rolling(26).min()
df['Kijun_Sen'] = (high_26 + low_26) /2
```

Senkou Span A - The senkou span A, or leading span A, is calculated by adding the tenkan-sen and the kijun-sen, dividing the result by two, and then plotting the result 26 periods ahead. The resulting line forms one edge of the kumo - or cloud - that's used to identify future areas of support and resistance.

[5]:
```
# Third Create Senkou Span A
df['Senkou_Span_A'] = ((df['Tenkan_Sen'] + df['Kijun_Sen']) / 2).shift(26)
```

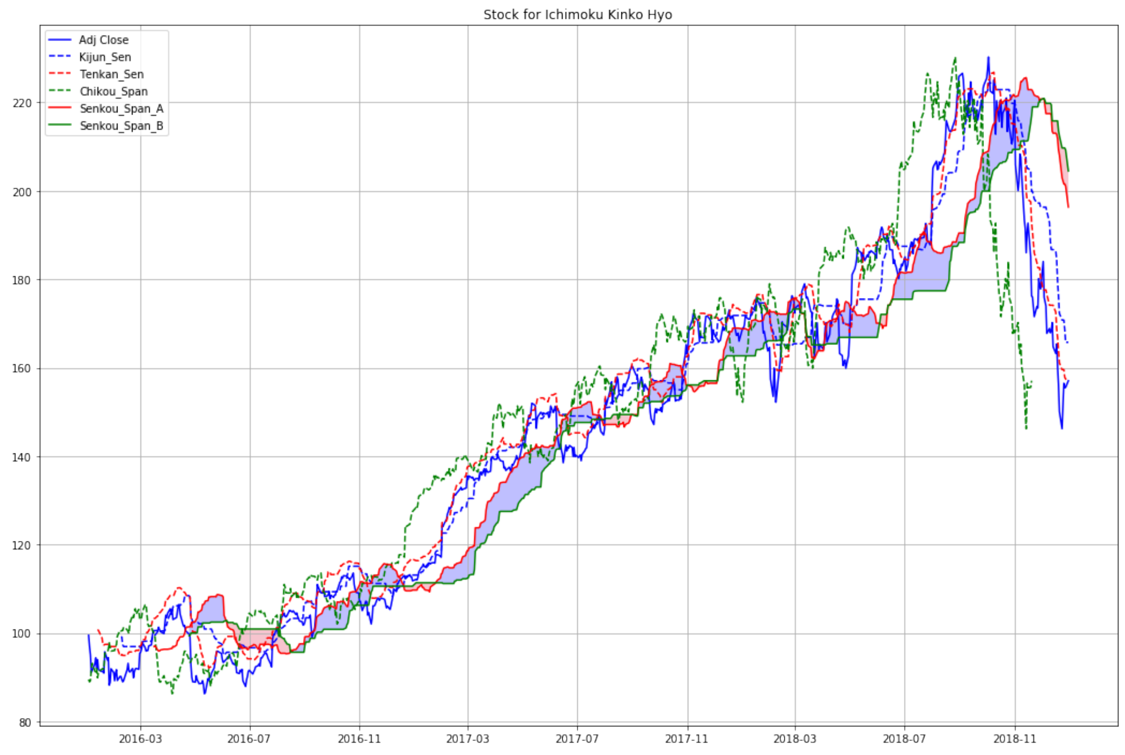
Senkou Span B - The senkou span B, or leading span B, is calculated by adding the highest high and the lowest low over the past 52 periods, dividing it by two, and then plotting the result 26 periods ahead. The resulting line forms the other edge of the kumo that's used to identify future areas of support and resistance.

[6]:
```
# Fourth Create Senkou Span B
high_52 = df['High'].rolling(52).max()
low_52 = df['Low'].rolling(52).min()
df['Senkou_Span_B'] = ((high_52 + low_52) /2).shift(26)
```

Chikou Span - The chikou span, or lagging span, is the current period's closing price plotted 26 days back on the chart. This line is used to show possible areas of support and resistance.

[7]:
```
df['Chikou_Span'] = df['Adj Close'].shift(-26)
```

```
[8]: plt.figure(figsize=(18,12))
plt.plot(df['Adj Close'], '-b')
plt.plot(df['Kijun_Sen'],  'b--')
plt.plot(df['Tenkan_Sen'],  'r--')
plt.plot(df['Chikou_Span'], 'g--')
plt.plot(df['Senkou_Span_A'], 'r')
plt.plot(df['Senkou_Span_B'], 'g')
plt.fill_between(df.index, df['Senkou_Span_A'], df['Senkou_Span_B'],␣
 ↪where=df['Senkou_Span_A']> df['Senkou_Span_B'], facecolor='blue',␣
 ↪interpolate=True, alpha=0.25)
plt.fill_between(df.index, df['Senkou_Span_A'], df['Senkou_Span_B'],␣
 ↪where=df['Senkou_Span_B']> df['Senkou_Span_A'], facecolor='crimson',␣
 ↪interpolate=True, alpha=0.25)
plt.grid()
plt.legend(loc='best')
plt.title('Stock for Ichimoku Kinko Hyo')
plt.show()
```



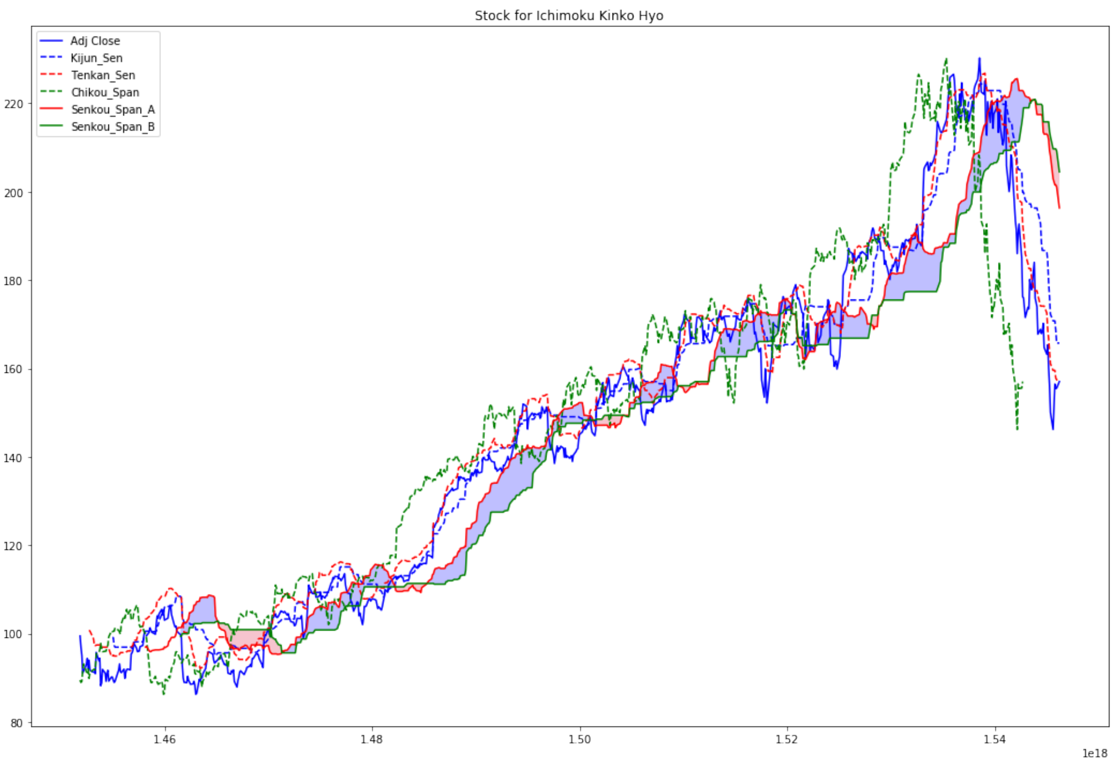
```
[9]: df2 = df.reset_index()
df2 = df2.apply(pd.to_numeric, errors='ignore')
df2.head()
```

```
[9]:                    Date        Open        High         Low       Close  \
0  1451865600000000000  102.610001  105.370003  102.000000  105.349998
1  1451952000000000000  105.750000  105.849998  102.410004  102.709999
2  1452038400000000000  100.559998  102.370003   99.870003  100.699997
3  1452124800000000000   98.680000  100.129997   96.430000   96.449997
4  1452211200000000000   98.550003   99.110001   96.760002   96.959999

   Adj Close    Volume  Tenkan_Sen  Kijun_Sen  Senkou_Span_A  Senkou_Span_B  \
0  99.499107  67649400         NaN        NaN            NaN            NaN
1  97.005730  55791000         NaN        NaN            NaN            NaN
2  95.107361  68457400         NaN        NaN            NaN            NaN
3  91.093399  81094400         NaN        NaN            NaN            NaN
4  91.575073  70798000         NaN        NaN            NaN            NaN

   Chikou_Span
0    89.517586
1    88.976318
2    89.251686
3    91.768089
4    93.173508
```

```
[10]: # This one does not show dates
plt.figure(figsize=(18,12))
plt.plot(df2['Date'], df2['Adj Close'], '-b')
plt.plot(df2['Date'], df2['Kijun_Sen'],  'b--')
plt.plot(df2['Date'], df2['Tenkan_Sen'],  'r--')
plt.plot(df2['Date'], df2['Chikou_Span'], 'g--')
plt.plot(df2['Date'], df2['Senkou_Span_A'], 'r')
plt.plot(df2['Date'], df2['Senkou_Span_B'], 'g')
plt.fill_between(df2['Date'], df2['Senkou_Span_A'], df2['Senkou_Span_B'],␣
 ↪where=df2['Senkou_Span_A']> df2['Senkou_Span_B'], facecolor='blue',␣
 ↪interpolate=True, alpha=0.25)
plt.fill_between(df2['Date'], df2['Senkou_Span_A'], df2['Senkou_Span_B'],␣
 ↪where=df2['Senkou_Span_B']> df2['Senkou_Span_A'], facecolor='crimson',␣
 ↪interpolate=True, alpha=0.25)
plt.legend(loc='best')
plt.title('Stock for Ichimoku Kinko Hyo')
plt.show()
```


Stock for Ichimoku Kinko Hyo
Adj Close
Kijun_Sen
Tenkan_Sen
Chikou_Span
Senkou_Span_A
Senkou_Span_B
220
200
180
160
140
120
100
80
1.46
1.48
1.50
1.52
1.54
1e18