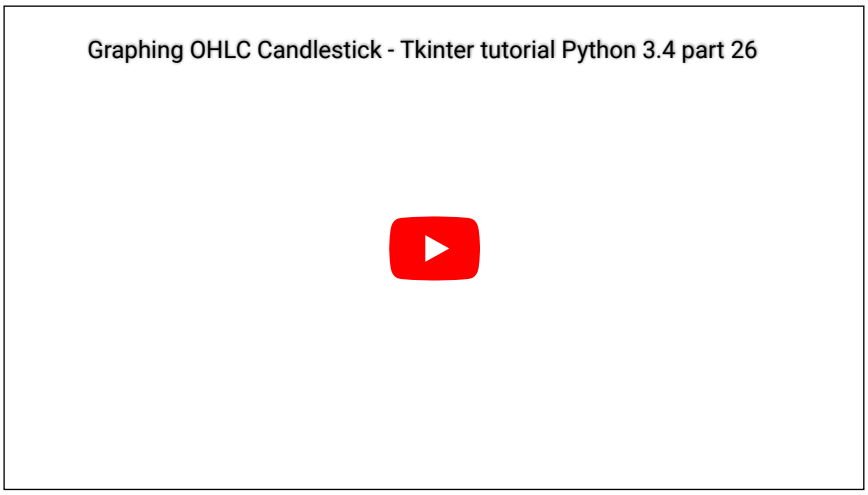
Graphing an OHLC candlestick graph embedded in our Tkinter GUI




```
# The code for changing pages was derived from: http://stackoverflow.com/questions/7546050/switch-between-two-
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import matplotlib
matplotlib.use("TkAgg")
from matplotlib.backends.backend_tkagg import FigureCanvasTkAgg, NavigationToolbar2TkAgg
#from matplotlib.figure import Figure
import matplotlib.animation as animation
from matplotlib import style
from matplotlib import pyplot as plt

import matplotlib.dates as mdates
import matplotlib.ticker as mticker
from matplotlib.finance import candlestick_ohlc


import tkinter as tk
from tkinter import ttk

import urllib
import json

import pandas as pd
import numpy as np




LARGE_FONT= ("Verdana", 12)
```

```
style.use("ggplot")

f = plt.figure()

#a = f.add_subplot(111)

exchange = "BTC-e"
DatCounter = 9000
programName = "btce"
resampleSize = "15Min"
DataPace = "1d"
candleWidth = 0.008

paneCount = 1

topIndicator = "none"
bottomIndicator = "none"
middleIndicator = "none"
chartLoad = True

darkColor = "#183A54"
lightColor = "#00A3E0"

EMAs = []
SMAs = []




def tutorial():

##    def leavemini(what):
##        what.destroy()

    def page2():
        tut.destroy()
        tut2 = tk.Tk()

        def page3():
            tut2.destroy()
            tut3 = tk.Tk()

            tut3.wm_title("Part 3!")

            label = ttk.Label(tut3, text="Part 3", font=NORM_FONT)
            label.pack(side="top", fill="x", pady=10)
            B1 = ttk.Button(tut3, text="Done!", command= tut3.destroy)
            B1.pack()
            tut3.mainloop()



        tut2.wm_title("Part 2!")
        label = ttk.Label(tut2, text="Part 2", font=NORM_FONT)
        label.pack(side="top", fill="x", pady=10)
        B1 = ttk.Button(tut2, text="Next", command= page3)
        B1.pack()
        tut2.mainloop()

    tut = tk.Tk()
    tut.wm_title("Tutorial")
```

```
    B1 = ttk.Button(tut, text = "Overview of the application", command=page2)
    B1.pack()

    B2 = ttk.Button(tut, text = "How do I trade with this client?", command=lambda:popupmsg("Not yet completed
    B2.pack()

    B3 = ttk.Button(tut, text = "Indicator Questions/Help", command=lambda:popupmsg("Not yet completed"))
    B3.pack()

    tut.mainloop()









def loadChart(run):
    global chartLoad

    if run == "start":
        chartLoad = True

    elif run == "stop":
        chartLoad = False




def addMiddleIndicator(what):
    global middleIndicator
    global DatCounter

    if DataPace == "tick":
        popupmsg("Indicators in Tick Data not available.")

    if what != "none":
        if middleIndicator == "none":
            if what == "sma":
                midIQ = tk.Tk()
                midIQ.wm_title("Periods?")
                label = ttk.Label(midIQ, text="Choose how many periods you want your SMA to be.")
                label.pack(side="top", fill="x", pady=10)
                e = ttk.Entry(midIQ)
                e.insert(0,10)
                e.pack()
                e.focus_set()

                def callback():
                    global middleIndicator
                    global DatCounter

                    middleIndicator = []
                    periods = (e.get())
                    group = []
                    group.append("sma")
                    group.append(int(periods))
```


```
                print("middle indicator set to:",middleIndicator)
                midIQ.destroy()

            b = ttk.Button(midIQ, text="Submit", width=10, command=callback)
            b.pack()
            tk.mainloop()

        if what == "ema":
            midIQ = tk.Tk()
            #midIQ.wm_title("Periods?")
            label = ttk.Label(midIQ, text="Choose how many periods you want your EMA to be.")
            label.pack(side="top", fill="x", pady=10)
            e = ttk.Entry(midIQ)
            e.insert(0,10)
            e.pack()
            e.focus_set()

            def callback():
                global middleIndicator
                global DatCounter

                middleIndicator = []
                periods = (e.get())
                group = []
                group.append("ema")
                group.append(int(periods))
                middleIndicator.append(group)
                DatCounter = 9000
                print("middle indicator set to:",middleIndicator)
                midIQ.destroy()

            b = ttk.Button(midIQ, text="Submit", width=10, command=callback)
            b.pack()
            tk.mainloop()

    else:
        if what == "sma":
            midIQ = tk.Tk()
            midIQ.wm_title("Periods?")
            label = ttk.Label(midIQ, text="Choose how many periods you want your SMA to be.")
            label.pack(side="top", fill="x", pady=10)
            e = ttk.Entry(midIQ)
            e.insert(0,10)
            e.pack()
            e.focus_set()

            def callback():
                global middleIndicator
                global DatCounter

                #middleIndicator = []
                periods = (e.get())
                group = []
                group.append("sma")
                group.append(int(periods))
                middleIndicator.append(group)
                DatCounter = 9000
                print("middle indicator set to:",middleIndicator)
                midIQ.destroy()

            b = ttk.Button(midIQ, text="Submit", width=10, command=callback)
            b.pack()
            tk.mainloop()
```

```
            if what == "ema":
                midIQ = tk.Tk()
                midIQ.wm_title("Periods?")
                label = ttk.Label(midIQ, text="Choose how many periods you want your EMA to be.")
                label.pack(side="top", fill="x", pady=10)
                e = ttk.Entry(midIQ)
                e.insert(0,10)
                e.pack()
                e.focus_set()

                def callback():
                    global middleIndicator
                    global DatCounter

                    #middleIndicator = []
                    periods = (e.get())
                    group = []
                    group.append("ema")
                    group.append(int(periods))
                    middleIndicator.append(group)
                    DatCounter = 9000
                    print("middle indicator set to:",middleIndicator)
                    midIQ.destroy()

                b = ttk.Button(midIQ, text="Submit", width=10, command=callback)
                b.pack()
                tk.mainloop()

    else:
        middleIndicator = "none"




def addTopIndicator(what):
    global topIndicator
    global DatCounter

    if DataPace == "tick":
        popupmsg("Indicators in Tick Data not available.")

    elif what == "none":
        topIndicator = what
        DatCounter = 9000

    elif what == "rsi":
        rsiQ = tk.Tk()
        rsiQ.wm_title("Periods?")
        label = ttk.Label(rsiQ, text = "Choose how many periods you want each RSI calculation to consider.")
        label.pack(side="top", fill="x", pady=10)

        e = ttk.Entry(rsiQ)
        e.insert(0,14)
        e.pack()
        e.focus_set()

        def callback():
            global topIndicator
            global DatCounter
```

```
            group.append("rsi")
            group.append(periods)

            topIndicator = group
            DatCounter = 9000
            print("Set top indicator to",group)
            rsiQ.destroy()

        b = ttk.Button(rsiQ, text="Submit", width=10, command=callback)
        b.pack()
        tk.mainloop()


    elif what == "macd":
        global topIndicator
        global DatCounter
        topIndicator = "macd"
        DatCounter = 9000


def addBottomIndicator(what):
    global bottomIndicator
    global DatCounter

    if DataPace == "tick":
        popupmsg("Indicators in Tick Data not available.")

    elif what == "none":
        bottomIndicator = what
        DatCounter = 9000

    elif what == "rsi":
        rsiQ = tk.Tk()
        rsiQ.wm_title("Periods?")
        label = ttk.Label(rsiQ, text = "Choose how many periods you want each RSI calculation to consider.")
        label.pack(side="top", fill="x", pady=10)

        e = ttk.Entry(rsiQ)
        e.insert(0,14)
        e.pack()
        e.focus_set()

        def callback():
            global bottomIndicator
            global DatCounter

            periods = (e.get())
            group = []
            group.append("rsi")
            group.append(periods)

            bottomIndicator = group
            DatCounter = 9000
            print("Set bottom indicator to",group)
            rsiQ.destroy()

        b = ttk.Button(rsiQ, text="Submit", width=10, command=callback)
        b.pack()
        tk.mainloop()


    elif what == "macd":
        global bottomIndicator
```

```
        DatCounter = 9000



def changeTimeFrame(tf):
    global DataPace
    global DatCounter
    if tf == "7d" and resampleSize == "1Min":
        popupmsg("Too much data chosen, choose a smaller time frame or higher OHLC interval")
    else:
        DataPace = tf
        DatCounter = 9000


def changeSampleSize(size,width):
    global resampleSize
    global DatCounter
    global candleWidth
    if DataPace == "7d" and resampleSize == "1Min":
        popupmsg("Too much data chosen, choose a smaller time frame or higher OHLC interval")

    elif DataPace == "tick":
        popupmsg("You're currently viewing tick data, not OHLC.")

    else:
        resampleSize = size
        DatCounter = 9000
        candleWidth = width



def changeExchange(toWhat,pn):
    global exchange
    global DatCounter
    global programName

    exchange = toWhat
    programName = pn
    DatCounter = 9000


def popupmsg(msg):
    popup = tk.Tk()
    popup.wm_title("!")
    label = ttk.Label(popup, text=msg, font=NORM_FONT)
    label.pack(side="top", fill="x", pady=10)
    B1 = ttk.Button(popup, text="Okay", command = popup.destroy)
    B1.pack()
    popup.mainloop()



def animate(i):
    global refreshRate
    global DatCounter

    def rsiIndicator(priceData,location="top"):

        try:
            if location == "top":
                values = {'key':1, "prices": priceData, "periods":topIndicator[1]}
            if location == "bottom":
```


```
            url = "http://seaofbtc.com/api/indicator/rsi"

            data = urllib.parse.urlencode(values)
            data = data.encode("utf-8")

            req = urllib.request.Request(url,data)
            resp = urllib.request.urlopen(req)

            respData = resp.read()

            newData = str(respData).replace("b","").replace("[","").replace("]","").replace("'","")
            priceList = newData.split(', ')




            rsiData = [float(i) for i in priceList]

            if location == "top":
                a0.plot_date(OHLC['MPLDates'], rsiData, lightColor, label="RSI")
                #datLabel = "RSI("+str(topIndicator[1])+")"
                #a0.set_ylabel(datLabel)

            if location == "bottom":
                a3.plot_date(OHLC['MPLDates'], rsiData, lightColor, label="RSI")
                #datLabel = "RSI("+str(topIndicator[1])+")"
                #a3.set_ylabel(datLabel)
        except Exception as e:
            print("failed in rsi", str(e))



if chartLoad:
    if paneCount == 1:
        if DataPace == "tick":
            try:
                if exchange == "BTC-e":
                    a = plt.subplot2grid((6,4), (0,0), rowspan = 5, colspan = 4)
                    a2 = plt.subplot2grid((6,4), (5,0), rowspan = 1, colspan = 4, sharex = a)

                    dataLink = 'https://btc-e.com/api/3/trades/btc_usd?limit=2000'
                    data = urllib.request.urlopen(dataLink)
                    data = data.readall().decode("utf-8")
                    data = json.loads(data)


                    data = data["btc_usd"]
                    data = pd.DataFrame(data)

                    data["datestamp"] = np.array(data['timestamp']).astype("datetime64[s]")
                    allDates = data["datestamp"].tolist()

                    buys = data[(data['type']=="bid")]
                    #buys["datestamp"] = np.array(buys["timestamp"]).astype("datetime64[s]")
                    buyDates = (buys["datestamp"]).tolist()


                    sells = data[(data['type']=="ask")]
                    #sells["datestamp"] = np.array(sells["timestamp"]).astype("datetime64[s]")
                    sellDates = (sells["datestamp"]).tolist()
```

```
                    a.clear()

                    a.plot_date(buyDates, buys["price"], lightColor, label="buys")
                    a.plot_date(sellDates, sells["price"], darkColor, label="sells")

                    a2.fill_between(allDates, 0, volume, facecolor = darkColor)

                    a.xaxis.set_major_locator(mticker.MaxNLocator(5))
                    a.xaxis.set_major_formatter(mdates.DateFormatter("%Y-%m-%d %H:%M:%S"))
                    plt.setp(a.get_xticklabels(), visible = False)



                    a.legend(bbox_to_anchor=(0, 1.02, 1, .102), loc=3,
                             ncol=2, borderaxespad=0)

                    title = "BTC-e BTCUSD Prices\nLast Price: "+str(data["price"][1999])
                    a.set_title(title)
                    priceData = data['price'].apply(float).tolist()

                if exchange == "Bitstamp":
                    a = plt.subplot2grid((6,4), (0,0), rowspan = 5, colspan = 4)
                    a2 = plt.subplot2grid((6,4), (5,0), rowspan = 1, colspan = 4, sharex = a)

                    dataLink = 'https://www.bitstamp.net/api/transactions/'
                    data = urllib.request.urlopen(dataLink)
                    data = data.readall().decode("utf-8")
                    data = json.loads(data)

                    data = pd.DataFrame(data)

                    data["datestamp"] = np.array(data['date'].apply(int)).astype("datetime64[s]")
                    dateStamps = data["datestamp"].tolist()
                    #allDates = data["datestamp"].tolist()

##                    buys = data[(data['type']=="bid")]
##                    #buys["datestamp"] = np.array(buys["timestamp"]).astype("datetime64[s]")
##                    buyDates = (buys["datestamp"]).tolist()
##
##
##                    sells = data[(data['type']=="ask")]
##                    #sells["datestamp"] = np.array(sells["timestamp"]).astype("datetime64[s]")
##                    sellDates = (sells["datestamp"]).tolist()

                    volume = data["amount"].apply(float).tolist()

                    a.clear()

                    a.plot_date(dateStamps, data["price"], lightColor, label="buys")

                    a2.fill_between(dateStamps, 0, volume, facecolor = darkColor)

                    a.xaxis.set_major_locator(mticker.MaxNLocator(5))
                    a.xaxis.set_major_formatter(mdates.DateFormatter("%Y-%m-%d %H:%M:%S"))
                    plt.setp(a.get_xticklabels(), visible = False)


                    a.legend(bbox_to_anchor=(0, 1.02, 1, .102), loc=3,
                             ncol=2, borderaxespad=0)

                    title = "Bitstamp BTCUSD Prices\nLast Price: "+str(data["price"][0])
                    a.set_title(title)
                    priceData = data['price'].apply(float).tolist()
```


```
    if exchange == "Bitfinex":
        a = plt.subplot2grid((6,4), (0,0), rowspan = 5, colspan = 4)
        a2 = plt.subplot2grid((6,4), (5,0), rowspan = 1, colspan = 4, sharex = a)

        dataLink = 'https://api.bitfinex.com/v1/trades/btcusd?limit=2000'
        data = urllib.request.urlopen(dataLink)
        data = data.readall().decode("utf-8")
        data = json.loads(data)


        data = pd.DataFrame(data)

        data["datestamp"] = np.array(data['timestamp']).astype("datetime64[s]")
        allDates = data["datestamp"].tolist()

        buys = data[(data['type']=="buy")]
        #buys["datestamp"] = np.array(buys["timestamp"]).astype("datetime64[s]")
        buyDates = (buys["datestamp"]).tolist()


        sells = data[(data['type']=="sell")]
        #sells["datestamp"] = np.array(sells["timestamp"]).astype("datetime64[s]")
        sellDates = (sells["datestamp"]).tolist()

        volume = data["amount"].apply(float).tolist()

        a.clear()

        a.plot_date(buyDates, buys["price"], lightColor, label="buys")
        a.plot_date(sellDates, sells["price"], darkColor, label="sells")

        a2.fill_between(allDates, 0, volume, facecolor = darkColor)

        a.xaxis.set_major_locator(mticker.MaxNLocator(5))
        a.xaxis.set_major_formatter(mdates.DateFormatter("%Y-%m-%d %H:%M:%S"))
        plt.setp(a.get_xticklabels(), visible = False)


        a.legend(bbox_to_anchor=(0, 1.02, 1, .102), loc=3,
                 ncol=2, borderaxespad=0)

        title = "Bitfinex BTCUSD Prices\nLast Price: "+str(data["price"][0])
        a.set_title(title)
        priceData = data['price'].apply(float).tolist()

    if exchange == "Huobi":
        a = plt.subplot2grid((6,4), (0,0), rowspan = 6, colspan = 4)
        data = urllib.request.urlopen('http://seaofbtc.com/api/basic/price?key=1&tf=1d&exchang
        data = data.decode()

        data = json.loads(data)

        dateStamp = np.array(data[0]).astype("datetime64[s]")
        dateStamp = dateStamp.tolist()

        df = pd.DataFrame({'Datetime':dateStamp})

        df['Price'] = data[1]
        df['Volume'] = data[2]
        df['Symbol'] = "BTCUSD"

        df['MPLDate'] = df['Datetime'].apply(lambda date: mdates.date2num(date.to_pydatetime()
```

```
                lastPrice = df["Price"][-1]

                a.plot_date(df['MPLDate'][-4500:], df['Price'][-4500:], lightColor, label="price")

                a.xaxis.set_major_locator(mticker.MaxNLocator(5))
                a.xaxis.set_major_formatter(mdates.DateFormatter("%Y-%m-%d %H:%M:%S"))

                title = "Huobi BTCUSD Prices\nLast Price: "+str(lastPrice)
                a.set_title(title)

                priceData = df['price'].apply(float).tolist()

            except Exception as e:
                print("Failed because of:",e)

        else:

            if DatCounter > 12:
                try:
                    if exchange == "Huobi":
                        if topIndicator != "none":
                            a = plt.subplot2grid((6,4),(1,0), rowspan=5, colspan = 4)
                            a2 = plt.subplot2grid((6,4),(0,0),sharex=a, rowspan=1, colspan = 4)
                        else:
                            a = plt.subplot2grid((6,4),(0,0), rowspan=6, colspan = 4)

                    else:
                        if topIndicator != "none" and bottomIndicator != "none":
                            # Main Graph
                            a = plt.subplot2grid((6,4), (1,0), rowspan = 3, colspan = 4)

                            # Volume
                            a2 = plt.subplot2grid((6,4), (4,0), sharex = a, rowspan = 1, colspan = 4)

                            # Bottom Indicator
                            a3 = plt.subplot2grid((6,4), (5,0), sharex = a, rowspan = 1, colspan = 4)

                            # Top Indicator
                            a0 = plt.subplot2grid((6,4), (0,0), sharex = a, rowspan = 1, colspan = 4)

                        elif topIndicator != "none":
                            # Main Graph
                            a = plt.subplot2grid((6,4), (1,0), rowspan = 4, colspan = 4)

                            # Volume
                            a2 = plt.subplot2grid((6,4), (5,0), sharex = a, rowspan = 1, colspan = 4)

                            # Top Indicator
                            a0 = plt.subplot2grid((6,4), (0,0), sharex = a, rowspan = 1, colspan = 4)

                        elif bottomIndicator != "none":

                            # Main Graph
                            a = plt.subplot2grid((6,4), (0,0), rowspan = 4, colspan = 4)

                            # Volume
                            a2 = plt.subplot2grid((6,4), (4,0), sharex = a, rowspan = 1, colspan = 4)

                            # Bottom Indicator
                            a3 = plt.subplot2grid((6,4), (5,0), sharex = a, rowspan = 1, colspan = 4)

                        else:
                            # Main Graph
```


```
            # Volume
            a2 = plt.subplot2grid((6,4), (5,0), sharex = a, rowspan = 1, colspan = 4)

    data = urllib.request.urlopen("http://seaofbtc.com/api/basic/price?key=1&tf="+DataPace
    data = data.decode()
    data = json.loads(data)

    dateStamp = np.array(data[0]).astype("datetime64[s]")
    dateStamp = dateStamp.tolist()

    df = pd.DataFrame({'Datetime':dateStamp})

    df['Price'] = data[1]
    df['Volume'] = data[2]
    df['Symbol'] = 'BTCUSD'
    df['MPLDate'] = df['Datetime'].apply(lambda date: mdates.date2num(date.to_pydatetime()
    df = df.set_index("Datetime")


    OHLC = df['Price'].resample(resampleSize, how="ohlc")
    OHLC = OHLC.dropna()

    volumeData = df['Volume'].resample(resampleSize, how={'volume':'sum'})

    OHLC["dateCopy"] = OHLC.index
    OHLC["MPLDates"] = OHLC["dateCopy"].apply(lambda date: mdates.date2num(date.to_pydatet

    del OHLC["dateCopy"]


    volumeData["dateCopy"] = volumeData.index
    volumeData["MPLDates"] = volumeData["dateCopy"].apply(lambda date: mdates.date2num(dat

    del volumeData["dateCopy"]

    priceData = OHLC['close'].apply(float).tolist()

    a.clear()

    if middleIndicator != "none":
        for eachMA in middleIndicator:
            #ewma = pd.stats.moments.ewma
            if eachMA[0] == "sma":
                sma = pd.rolling_mean(OHLC["close"], eachMA[1])
                label = str(eachMA[1])+" SMA"
                a.plot(OHLC["MPLDates"], sma, label=label)

            if eachMA[0] == "ema":
                ewma = pd.stats.moments.ewma
                label = str(eachMA[1])+" EMA"
                a.plot(OHLC["MPLDates"], ewma(OHLC["close"], eachMA[1]), label=label)

        a.legend(loc=0)


    if topIndicator[0] == "rsi":
        rsiIndicator(priceData,"top")

    elif topIndicator == "macd":
        try:
            computeMACD(priceData, location = "top")

        except Exception as e:
```

```
            if bottomIndicator[0] == "rsi":
                rsiIndicator(priceData,"bottom")

            elif bottomIndicator == "macd":
                try:
                    computeMACD(priceData, location = "bottom")

                except Exception as e:
                    print(str(e))

            csticks = candlestick_ohlc(a, OHLC[["MPLDates","open","high","low","close"]].values, w
            a.set_ylabel("Price")
            if exchange != "Huobi":
                a2.fill_between(volumeData["MPLDates"],0, volumeData['volume'], facecolor = darkCo
                a2.set_ylabel("Volume")

            a.xaxis.set_major_locator(mticker.MaxNLocator(3))
            a.xaxis.set_major_formatter(mdates.DateFormatter('%Y-%m-%d %H:%M'))

            if exchange != "Huobi":
                plt.setp(a.get_xticklabels(), visible=False)


            if topIndicator != "none":
                plt.setp(a0.get_xticklabels(), visible=False)

            if bottomIndicator != "none":
                plt.setp(a2.get_xticklabels(), visible=False)

            x = (len(OHLC['close']))-1

            if DataPace == "1d":
                title = exchange+" 1 Day Data with "+resampleSize+" Bars\nLast Price: "+str(OHLC['
            if DataPace == "3d":
                title = exchange+" 3 Day Data with "+resampleSize+" Bars\nLast Price: "+str(OHLC['
            if DataPace == "7d":
                title = exchange+" 7 Day Data with "+resampleSize+" Bars\nLast Price: "+str(OHLC['

            if topIndicator != "none":
                a0.set_title(title)

            else:
                a.set_title(title)

            print("New Graph")
            DatCounter = 0



        except Exception as e:
            print('failed in the non-tick animate:',str(e))
            DatCounter = 9000

    else:
        DatCounter += 1
```


```
class SeaofBTCapp(tk.Tk):

    def __init__(self, *args, **kwargs):

        tk.Tk.__init__(self, *args, **kwargs)


        tk.Tk.wm_title(self, "Sea of BTC client")


        container = tk.Frame(self)
        container.pack(side="top", fill="both", expand = True)
        container.grid_rowconfigure(0, weight=1)
        container.grid_columnconfigure(0, weight=1)


        menubar = tk.Menu(container)
        filemenu = tk.Menu(menubar, tearoff=0)
        filemenu.add_command(label="Save settings", command = lambda: popupmsg("Not supported just yet!"))
        filemenu.add_separator()
        filemenu.add_command(label="Exit", command=quit)
        menubar.add_cascade(label="File", menu=filemenu)

        exchangeChoice = tk.Menu(menubar, tearoff=1)
        exchangeChoice.add_command(label="BTC-e",
                                   command=lambda: changeExchange("BTC-e","btce"))
        exchangeChoice.add_command(label="Bitfinex",
                                   command=lambda: changeExchange("Bitfinex","bitfinex"))
        exchangeChoice.add_command(label="Bitstamp",
                                   command=lambda: changeExchange("Bitstamp","bitstamp"))
        exchangeChoice.add_command(label="Huobi",
                                   command=lambda: changeExchange("Huobi","huobi"))

        menubar.add_cascade(label="Exchange", menu=exchangeChoice)

        dataTF = tk.Menu(menubar, tearoff=1)
        dataTF.add_command(label = "Tick",
                           command=lambda: changeTimeFrame('tick'))
        dataTF.add_command(label = "1 Day",
                           command=lambda: changeTimeFrame('1d'))
        dataTF.add_command(label = "3 Day",
                           command=lambda: changeTimeFrame('3d'))
        dataTF.add_command(label = "1 Week",
                           command=lambda: changeTimeFrame('7d'))
        menubar.add_cascade(label = "Data Time Frame", menu = dataTF)

        OHLCI = tk.Menu(menubar, tearoff=1)
        OHLCI.add_command(label = "Tick",
                           command=lambda: changeTimeFrame('tick'))
        OHLCI.add_command(label = "1 minute",
                           command=lambda: changeSampleSize('1Min', 0.0005))
        OHLCI.add_command(label = "5 minute",
                           command=lambda: changeSampleSize('5Min', 0.003))
        OHLCI.add_command(label = "15 minute",
                           command=lambda: changeSampleSize('15Min', 0.008))
        OHLCI.add_command(label = "30 minute",
                           command=lambda: changeSampleSize('30Min', 0.016))
        OHLCI.add_command(label = "1 Hour",
                           command=lambda: changeSampleSize('1H', 0.032))
        OHLCI.add_command(label = "3 Hour",
                           command=lambda: changeSampleSize('3H', 0.096))

        menubar.add_cascade(label="OHLC Interval", menu=OHLCI)
```


```
        topIndi = tk.Menu(menubar, tearoff=1)
        topIndi.add_command(label="None",
                            command = lambda: addTopIndicator('none'))
        topIndi.add_command(label="RSI",
                            command = lambda: addTopIndicator('rsi'))
        topIndi.add_command(label="MACD",
                            command = lambda: addTopIndicator('macd'))

        menubar.add_cascade(label="Top Indicator", menu=topIndi)



        mainI = tk.Menu(menubar, tearoff=1)
        mainI.add_command(label="None",
                            command = lambda: addMiddleIndicator('none'))
        mainI.add_command(label="SMA",
                            command = lambda: addMiddleIndicator('sma'))
        mainI.add_command(label="EMA",
                            command = lambda: addMiddleIndicator('ema'))

        menubar.add_cascade(label="Main/middle Indicator", menu=mainI)




        bottomI = tk.Menu(menubar, tearoff=1)
        bottomI.add_command(label="None",
                            command = lambda: addBottomIndicator('none'))
        bottomI.add_command(label="RSI",
                            command = lambda: addBottomIndicator('rsi'))
        bottomI.add_command(label="MACD",
                            command = lambda: addBottomIndicator('macd'))

        menubar.add_cascade(label="Bottom Indicator", menu=bottomI)


        tradeButton = tk.Menu(menubar, tearoff=1)
        tradeButton.add_command(label = "Manual Trading",
                                command=lambda: popupmsg("This is not live yet"))
        tradeButton.add_command(label = "Automated Trading",
                                command=lambda: popupmsg("This is not live yet"))

        tradeButton.add_separator()
        tradeButton.add_command(label = "Quick Buy",
                                command=lambda: popupmsg("This is not live yet"))
        tradeButton.add_command(label = "Quick Sell",
                                command=lambda: popupmsg("This is not live yet"))

        tradeButton.add_separator()
        tradeButton.add_command(label = "Set-up Quick Buy/Sell",
                                command=lambda: popupmsg("This is not live yet"))

        menubar.add_cascade(label="Trading", menu=tradeButton)

        startStop = tk.Menu(menubar, tearoff = 1)
        startStop.add_command( label="Resume",
                               command = lambda: loadChart('start'))
        startStop.add_command( label="Pause",
                               command = lambda: loadChart('stop'))
        menubar.add_cascade(label = "Resume/Pause client", menu = startStop)

        helpmenu = tk.Menu(menubar, tearoff=0)
        helpmenu.add_command(label="Tutorial", command=tutorial)
```

```
        tk.Tk.config(self, menu=menubar)

        self.frames = {}

        for F in (StartPage, BTCe_Page):

            frame = F(container, self)

            self.frames[F] = frame

            frame.grid(row=0, column=0, sticky="nsew")

        self.show_frame(StartPage)

        tk.Tk.iconbitmap(self, default="clienticon.ico")

    def show_frame(self, cont):

        frame = self.frames[cont]
        frame.tkraise()


class StartPage(tk.Frame):

    def __init__(self, parent, controller):
        tk.Frame.__init__(self,parent)
        label = tk.Label(self, text=("""ALPHA Bitcoin trading application
        use at your own risk. There is no promise
        of warranty."""), font=LARGE_FONT)
        label.pack(pady=10,padx=10)

        button1 = ttk.Button(self, text="Agree",
                             command=lambda: controller.show_frame(BTCe_Page))
        button1.pack()

        button2 = ttk.Button(self, text="Disagree",
                             command=quit)
        button2.pack()



class PageOne(tk.Frame):

    def __init__(self, parent, controller):
        tk.Frame.__init__(self, parent)
        label = tk.Label(self, text="Page One!!!", font=LARGE_FONT)
        label.pack(pady=10,padx=10)

        button1 = ttk.Button(self, text="Back to Home",
                             command=lambda: controller.show_frame(StartPage))
        button1.pack()
```

```
class BTCe_Page(tk.Frame):

    def __init__(self, parent, controller):
        tk.Frame.__init__(self, parent)
        label = tk.Label(self, text="Graph Page!", font=LARGE_FONT)
        label.pack(pady=10,padx=10)

        button1 = ttk.Button(self, text="Back to Home",
                             command=lambda: controller.show_frame(StartPage))
        button1.pack()




        canvas = FigureCanvasTkAgg(f, self)
        canvas.show()
        canvas.get_tk_widget().pack(side=tk.BOTTOM, fill=tk.BOTH, expand=True)

        toolbar = NavigationToolbar2TkAgg(canvas, self)
        toolbar.update()
        canvas._tkcanvas.pack(side=tk.TOP, fill=tk.BOTH, expand=True)

app = SeaofBTCapp()
app.geometry("1280x720")
ani = animation.FuncAnimation(f, animate, interval=2000)
app.mainloop()
```

The next tutorial: Acquiring RSI Data From Sea Of BTC API

You've reached the end!

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