QF635 BTC Future live Strategy

BTC Future | ML by YU Lingfeng

reading per second data on order book information

training for piecewise few hours

live trading for targeted number of trades

In [1]:
```
# Import the library notebook as a module
%run G12BTC.ipynb

#### 1.1
try:
    # Try to read the CSV file into a DataFrame
    ML_files = glob.glob('+++*.csv')
    MLdata = pd.read_csv(ML_files[-1], index_col=[0])

except FileNotFoundError:
    # Handle the case where the file is not found
    print("File not found or unable to read the file.")

# Display the DataFrame
#     print(MLdata.shape)
#     print(MLdata.head())


models = []

# Regression
models.append(("LASSO001", Lasso(alpha = 0.01)
              )
             )

model_results_10s =\
    model_training(models, MLdata, 0.8, period=10,
                   y_idx=1, x_idx_list=np.arange(2,MLdata.shape[1]),
                   threshold=1)



Threshold = 6
model_choice =\
    model_results_10s[0][2]

api_key, api_secret =\
    get_credential()

size = 0.01
target_trade_num = 20
trade_num = 0
N_tier = 20
Asset = 'BTCUSDT'
api_key, api_secret =\
    get_credential()

#############################################
```

```
print("initialize account")
stop_loss(api_key, api_secret, Asset, 3)
sleep(2)
while trade_num < target_trade_num:

    print('generate signal')
    # Get request to get order book snapshot of BTCUSDT
    response = requests.get('https://fapi.binance.com/fapi/v1/depth', params={'symbo
    sleep(2)
    # Get json object from response
    json_object = response.json()

    # call parse() method to convert json message to order book object
    order_book = parse(json_object)
    current_order_book =\
        [
            datetime.fromtimestamp(order_book.timestamp),
            order_book.mid(),
            order_book.spread(),
        ]\
        + order_book.n_bid_ask(N_tier)

    target =\
        model_choice.predict([current_order_book[2:]])[0]
    print(f"our target is {target}")
    spread =\
        current_order_book[2]
    best_long =\
        order_book.best_ask()
    best_short =\
        order_book.best_bid()
    print(f"mid price is {0.5*(best_short+best_short)}")
    print(f"best ask is {best_long}, best bid is {best_short}")
    print(f"spread is {spread}")

    recent =\
       recent_trade(api_key, api_secret, 'BTCUSDT')
    prices = [float(entry['price']) for entry in recent[:20]]

    # Find maximum and minimum prices
    max_price = max(prices)
    min_price = min(prices)


    print("Maximum price:", max_price)
    print("Minimum price:", min_price)
    if target - best_long > Threshold * spread:
        is_buy = True
        best_long = min(min_price, best_long)
        price_level = round(best_long*(1-0.001),1)
        TP_level = round(price_level*(1+0.0015),1)
        print(f"we shall long at {price_level}!")

    elif target - best_short < -Threshold * spread:
        is_buy = False
        best_short = max(max_price, best_short)
        price_level = round(best_short*(1+0.001),1)
        TP_level = round(price_level*(1-0.0015),1)
        print(f"we shall short at {price_level}!")

    else:
        print("we shall wait!")
        sleep(1)
        continue
```

```
    print('send limit order')

    send_limit_order(api_key,
                     api_secret,
                     Asset,
                     size,
                     is_buy,
                     'GTC',
                     price_level)

    sleep(10)
    print('send TP order')
    send_limit_order(api_key,
                     api_secret,
                     Asset,
                     size,
                     not is_buy,
                     'GTC',
                     TP_level)
    sleep(10)

    my_order =\
        get_open_orders(api_key, api_secret, Asset)
    positions =\
        get_open_positions(api_key, api_secret, Asset)
    sleep(2)

    if (len(my_order) == 0):
        if float(positions[0]['positionAmt']) == 0:
            sleep(2)
            print("we are starting over")


    while (len(my_order)>0):
        positions =\
            get_open_positions(api_key, api_secret, Asset)
        sleep(2)

        if(float(positions[0]['unRealizedProfit'])<-10):
            stop_loss(api_key, api_secret, Asset, 3)
            sleep(2)
            trade_num += 1
            break


        sleep(10)
        my_order =\
            get_open_orders(api_key, api_secret, Asset)
        sleep(2)
        if (len(my_order)==0):
            print(f'we have take profit at {TP_level}')
            trade_num += 1


#############################################

my_history =\
    trade_history(api_key, api_secret, Asset)

pnl = []
timetag = []
for i in range(len(my_history)):
    timetag +=\
```

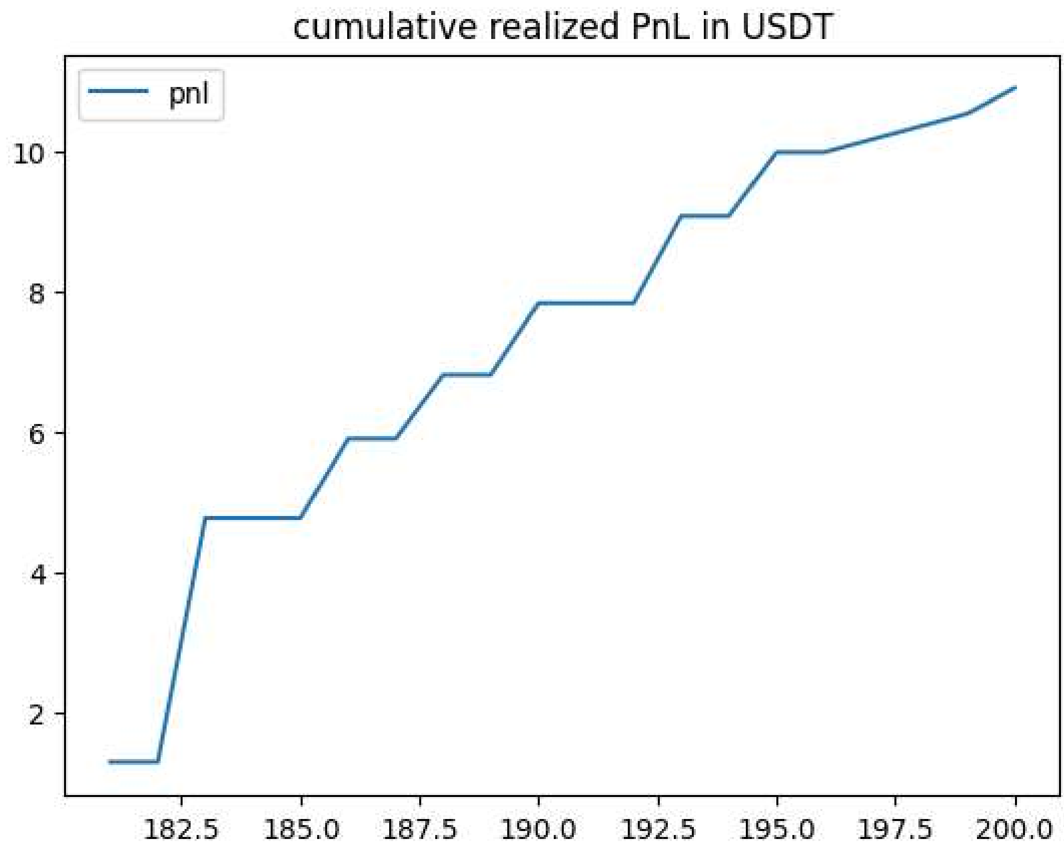
```
        [datetime\
            .fromtimestamp(
            my_history[i]['time']/1000
        )]
    pnl += [float(my_history[i]['realizedPnl'])]

history =\
    pd.DataFrame({'time': timetag, 'pnl': pnl})
history['win'] =\
    np.sign(history['pnl'])
history.iloc[-target_trade_num:]['win'].value_counts()
history.iloc[-target_trade_num:]['pnl'].cumsum().plot()
plt.legend()
plt.title("cumulative realized PnL in USDT")
```

```
All libraries and funcitons loaded
2024-05-11 00:58:06,034 [MainThread  ] [INFO ]  Query string: symbol=BTCUSDT&timesta
mp=1715360286034
ML training for LASSO001 done
number of sig: 122, win rate is 63.9344262295082O5%
wins 78, loses 44
most accurate model is LASSO001 at 63.934426229508205% accuracy
dotenv loaded successfully: True
dotenv loaded successfully: True
initialize account
All open orders cancelled successfully.
2024-05-11 00:58:06,276 [MainThread  ] [INFO ]  Query string: symbol=BTCUSDT&timesta
mp=1715360286227
No open positions!
generate signal
2024-05-11 00:58:10,717 [MainThread  ] [INFO ]  Query string: symbol=BTCUSDT
2024-05-11 00:58:10,821 [MainThread  ] [INFO ]  Query string: symbol=BTCUSDT&side=BU
Y&type=LIMIT&quantity=0.01&price=60519.8&timeInForce=GTC&timestamp=1715360290321
our target is 61067.37903315359
mid price is 61063.9
best ask is 61064.0, best bid is 61063.9
spread is 0.09999999999854481
Maximum price: 60710.0
Minimum price: 60580.4
we shall long at 60519.8!
send limit order
4035199590
2024-05-11 00:58:20,924 [MainThread  ] [INFO ]  Query string: symbol=BTCUSDT&side=SE
LL&type=LIMIT&quantity=0.01&price=60610.6&timeInForce=GTC&timestamp=1715360300424
send TP order
4035199667
```

```
2024-05-12 14:46:58,651 [MainThread  ] [INFO ]  Query string: symbol=BTCUSDT&timestamp=1715496418651
2024-05-12 14:46:58,865 [MainThread  ] [INFO ]  Query string: symbol=BTCUSDT&timestamp=1715496418951
2024-05-12 14:47:01,085 [MainThread  ] [INFO ]  Query string: symbol=BTCUSDT&timestamp=1715496421166
2024-05-12 14:47:13,208 [MainThread  ] [INFO ]  Query string: symbol=BTCUSDT&timestamp=1715496433208
2024-05-12 14:47:15,428 [MainThread  ] [INFO ]  Query string: symbol=BTCUSDT&timestamp=1715496435514
2024-05-12 14:47:27,538 [MainThread  ] [INFO ]  Query string: symbol=BTCUSDT&timestamp=1715496447538
2024-05-12 14:47:29,758 [MainThread  ] [INFO ]  Query string: symbol=BTCUSDT&timestamp=1715496449843
2024-05-12 14:47:42,002 [MainThread  ] [INFO ]  Query string: symbol=BTCUSDT&timestamp=1715496462002
we have take profit at 60830.3
generate signal
2024-05-12 14:47:46,668 [MainThread  ] [INFO ]  Query string: symbol=BTCUSDT
2024-05-12 14:47:46,776 [MainThread  ] [INFO ]  Query string: symbol=BTCUSDT&side=BUY&type=LIMIT&quantity=0.01&price=60739.2&timeInForce=GTC&timestamp=1715496466276
our target is 60927.048452240575
mid price is 60919.3
best ask is 60919.4, best bid is 60919.3
spread is 0.09999999999854481
Maximum price: 61110.6
Minimum price: 60800.0
we shall long at 60739.2!
send limit order
4035743280
2024-05-12 14:47:56,885 [MainThread  ] [INFO ]  Query string: symbol=BTCUSDT&side=SELL&type=LIMIT&quantity=0.01&price=60830.3&timeInForce=GTC&timestamp=1715496476385
send TP order
4035743302
2024-05-12 14:48:07,004 [MainThread  ] [INFO ]  Query string: symbol=BTCUSDT&timestamp=1715496487004
2024-05-12 14:48:07,230 [MainThread  ] [INFO ]  Query string: symbol=BTCUSDT&timestamp=1715496487312
2024-05-12 14:48:09,449 [MainThread  ] [INFO ]  Query string: symbol=BTCUSDT&timestamp=1715496489535
2024-05-12 14:48:21,553 [MainThread  ] [INFO ]  Query string: symbol=BTCUSDT&timestamp=1715496501553
2024-05-12 14:48:23,779 [MainThread  ] [INFO ]  Query string: symbol=BTCUSDT&timestamp=1715496503865
2024-05-12 14:48:35,899 [MainThread  ] [INFO ]  Query string: symbol=BTCUSDT&timestamp=1715496515899
2024-05-12 14:48:38,015 [MainThread  ] [INFO ]  Query string: symbol=BTCUSDT&timestamp=1715496518015
we have take profit at 60830.3
```

Out[1]:
```
Text(0.5, 1.0, 'cumulative realized PnL in USDT')
```



In [9]:
```
history[128:].to_csv("20240511-12 API trading 20 times.csv")
history[128:]
```

Out[9]:

	time	pnl	win
128	2024-05-11 00:58:20.985	0.0000	0.0
129	2024-05-11 01:22:09.615	2.3020	1.0
130	2024-05-11 01:22:28.856	0.0000	0.0
131	2024-05-11 01:22:33.797	0.9070	1.0
132	2024-05-11 01:22:49.293	0.0000	0.0
...	...	...	...
196	2024-05-12 14:47:47.037	0.0000	0.0
197	2024-05-12 14:47:57.590	0.1822	1.0
198	2024-05-12 14:47:57.919	0.1822	1.0
199	2024-05-12 14:47:58.016	0.1822	1.0
200	2024-05-12 14:48:31.012	0.3644	1.0

73 rows × 3 columns

In [5]:
```
Image("1st order sanity check.png")
```

```
plt.title("cumulative realized PnL in USDT")
```

Out[5]:

```
All libraries and funcitons loaded
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C&timestamp=1715360300424
send TP order
4035199667
```
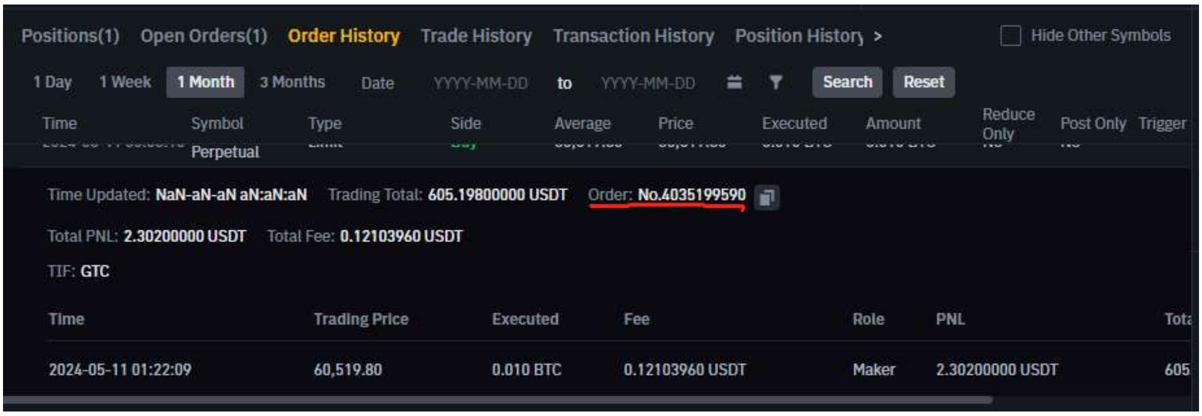

In [6]:

```
Image("1st order 4035199590.png")
```

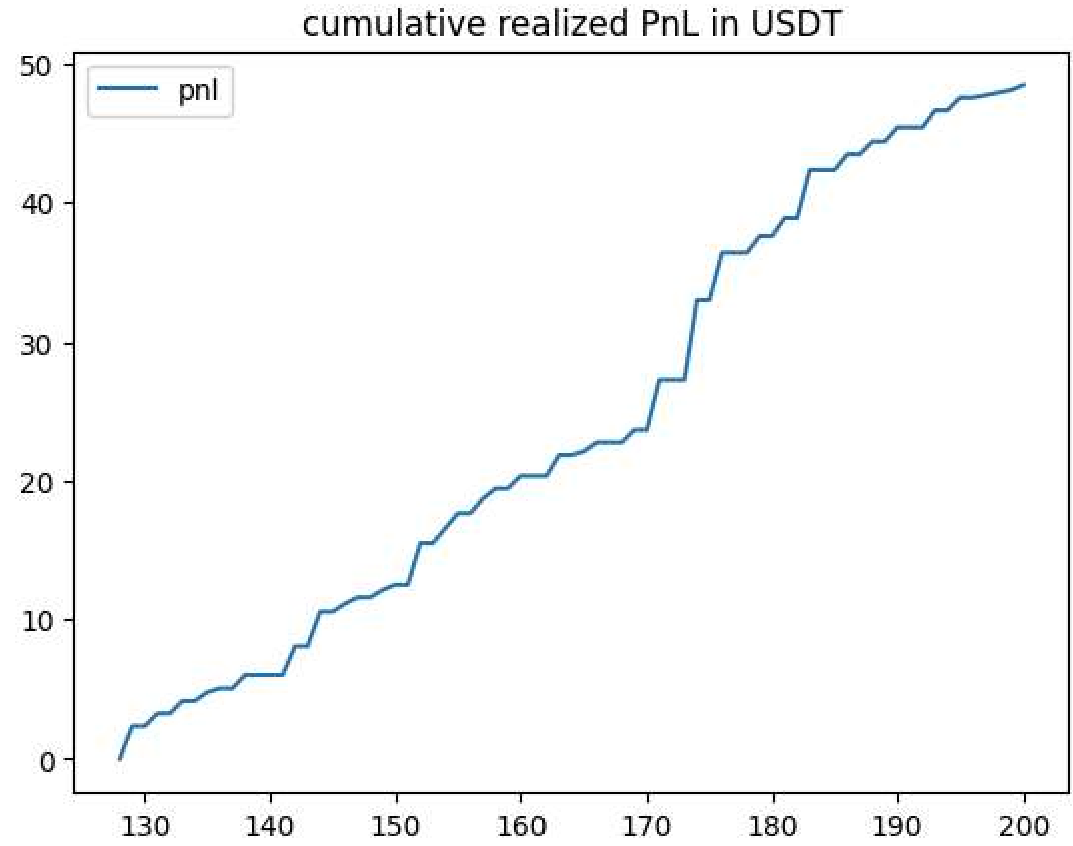
Out[6]:



In [7]:

```
Image("20240511-12 API trading 20 times.png")
```

Out[7]:


cumulative realized PnL in USDT
pnl
50
40
30
20
10
0
130
140
150
160
170
180
190
200

In [ ]: