



Equip Yourself with *Quant Jargon*: A Guide Featuring *Python*.

Zane Wu, 2024-10-23
CDA Tech Dept. (Industry Explorers)



Table of contents

01 Introduction

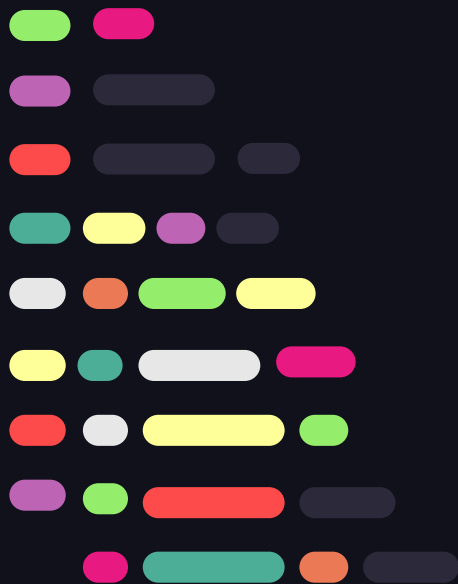
Gossip, what is Quant,
How do Quant firms operate, the taxonomy of Quant firms

02 Securities

Stock, other securities,
Trading Rules and Constraints, Stock codes

03 Data and Programming

Data, Performance metrics, Order book
3 little projects





01 { ..

Introduction

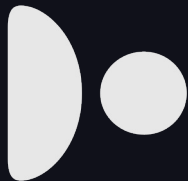
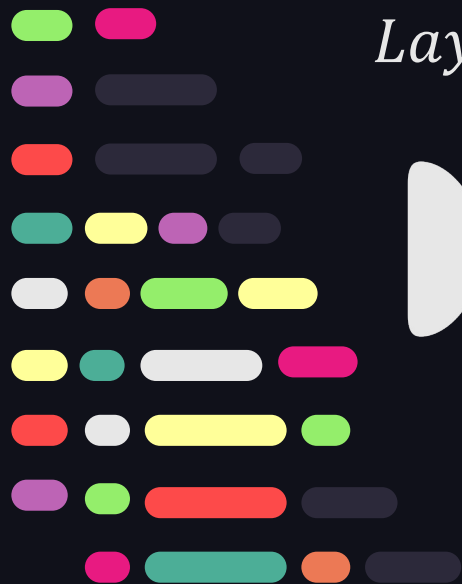


} ..

{ Gossip...



Layman → Hearsay Gamer → Noob → Master



Three kinds of investors

Technical

Seemingly mysterious



Fundamental

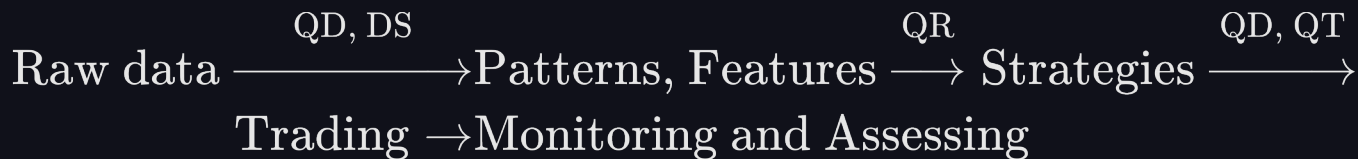
Focus on corporate finance, but sometimes contradicts with each other

Quantitative

Data-driven, powerful but sometimes obscure



How do Quant Firms Operate?



QR



Quantitative Researcher
designs strategies

Positions



QT

Quantitative Trader
executes strategies
and manages risk.

QD



Quantitative Developer
builds smart software



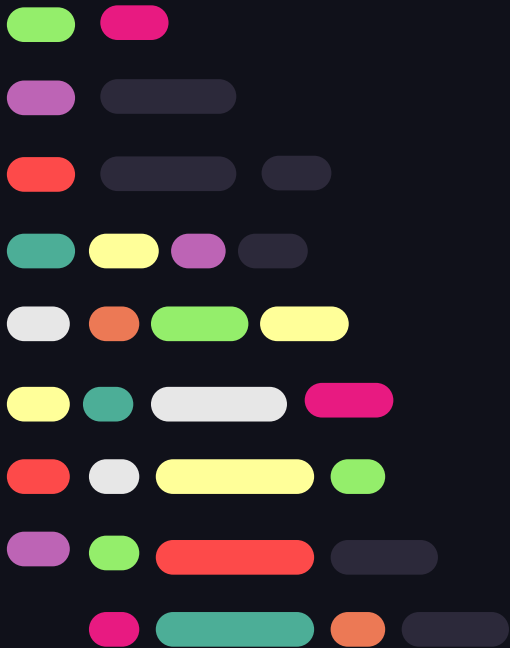
Others

P-quant
Q-quant





Task 01



Try to find Job Descriptions from the following resources:

- HFA Communities
- Internship Monk, Boss Zhipin
- FDU QIA, SJTU QAA
- Official Websites of Quant firms

Expected Result:

Actually we find that **QR and QD** are major job positions.



Taxonomy of Quant Firms





GUGGENHEIM

EXODUSPOINT®



WORLDQUANT

optiver▲



Renaissance



CITADEL



BRIDGEWATER



TOWER
RESEARCH CAPITAL



SIG
SUSQUEHANNA

MARSHALL WACE

HAPCAPITAL

GSA
Capital



Point 72

Goldman
Sachs



Jane
Street

HRT



PanAgora

BlackRock®

DE Shaw & Co



02 { ..

Securities



} ..

Before we go further..



Primary Market

Secondary Market



What do Quant firms trade?

■ 图表 量化机构 2023 年投资研究标的

选项	2022 年比例	选项	2023 年比例
A 股	78.68%	A 股股票	79.76%
期货	53.81%	期货	58.33%
期权	31.98%	期权	36.31%
债券	28.93%	债券	32.14%
港股	18.78%	港股	16.67%
美股	14.72%	美股	13.1%
新兴市场股票（印度、越南等）	7.61%	新兴市场股票	3.57%
数字货币	14.72%	数字货币	5.36%
其他	3.05%	场外衍生品	25%
(空)	3.05%	其他	6.55%

数据资料来源：《2022-2023 中国量化投资白皮书》问卷调查



Stock

Stocks are securities issued by companies to raise funds, representing partial ownership.

Buying stock makes you a **shareholder**, entitling you to a portion of profits and assets.

A-shares: Denominated in RMB, available to domestic and qualified foreign investors.





Stock



Free-Float Market Capitalization = Close \times Free-Float Shares

Details:



- Close VS. `rt_last`
- Trading Time





Other Securities



Bond

A borrowing promise issued by governments or companies to raise funds.

Index

A basket of representative stocks/assets reflecting market performance.

Fund

Pooled investor funds managed by professionals to diversify risk and enhance returns.

Future

Contracts to buy/sell assets at a future date for a set price.

Option

Rights to buy/sell assets at a specified price within a timeframe.

Digital Currency

Electronic money secured by cryptography for online transactions





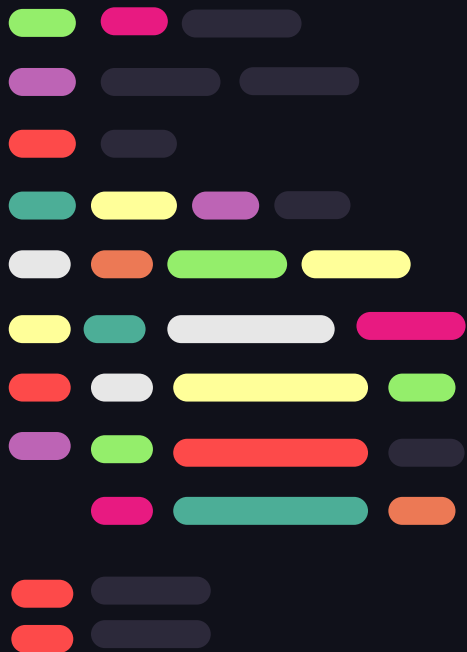
Details in Trading: Interval

10:33:27	19.35↓	933	10:34:09	19.31	1865
10:33:30	19.36↑	1504	10:34:12	19.30↓	856
10:33:33	19.35↓	1756	10:34:15	19.30	1040
10:33:36	19.35	1610	10:34:18	19.31↑	1300.2
10:33:39	19.34↓	1250	10:34:21	19.30↓	992
10:33:42	19.34	1045	10:34:24	19.31↑	895
10:33:45	19.35↑	1055	10:34:27	19.31	802
10:33:48	19.32↓	1097	10:34:30	19.31	1128
10:33:51	19.34↑	912	10:34:33	19.30↓	1573
10:33:54	19.33↓	1171	10:34:36	19.30	1159
10:33:57	19.33	1405	10:34:39	19.30	2041
10:34:00	19.33	932.2	10:34:42	19.29↓	913
10:34:03	19.33	856	10:34:45	19.29	1737
10:34:06	19.31↓	6816			

The **Tick** data of 300059.SZ on 10/14/2024

- Col 1: a time series with 3-second intervals.
- Col 2: the latest price.
- Col 3: trading volume in "lots" (1 lot = 100 shares in the A-share market).

Task 02



Tick Data Research

Find Tick data for the following:

- CSI 300
- Scientific Innovation 50 ETF
- Futures (Soybean Meal 2501, CSI 1000 2501)

Consider the following question:

- Is Tick data *snapshot data* or *atomic data*?





Details in Trading: Rules



T+0

Investors can sell securities bought on the same trading day, but multiple buy-sell operations are not unlimited.

T+1



Stocks bought on the same day can only be sold on the next trading day. Funds from a sale can be used immediately for other purchases, but the sold stock cannot be repurchased that day.



Details in Trading: Hidden Costs

Transaction Costs

expenses incurred during buying and selling, including commissions and fees

Slippage

the difference between the expected and actual execution prices

Margin

the amount investors must deposit to secure trades, enabling leveraged trading



Stock Code

```
def code_check(code: str) -> str:
    """
    支持A股股票(`stk`)、ETF(`etf`)、指数(`idx`)、股指期货(`cfe`)的分类 \n
    如果有新品种上市, 请修改此函数, last update 20240910
    """
    # 首位字符对应品种的情况用`db_dict`映射, 特殊情况用if, else
    db_dict = {
        '1': 'etf', '3': 'stk', '4': 'stk', '5': 'etf',
        '6': 'stk', '8': 'stk', '9': 'idx'
    }
    if '.' not in code:
        raise ValueError('请用\'.\'分割代码或补充交易所后缀')

    code, suffix = code.split('.')
    s0, s3 = code[0], code[0:3]
    if s0 == 'I':
        return 'cfe'
    if s0 == '0':
        return 'stk' if suffix == 'SZ' else 'idx'
    if s3 == '399' or s3 == '899':
        return 'idx'
    if s3 == '920':
        return 'stk'
    return db_dict[s0]
```





03 { ..

Data and Programming



} ..



Recall: Three kinds of investors



M: 一阳吞三阴，主力做多强……今天上证指数的MA5超过MA10了，是金叉！ALL IN, BUY CHINA!



ER: 牛市暴涨结束了，看看我挚爱的药明康德……嗯？居然是三连阴？还好抛的早！我想想……当前市场处于预期大拐点向行情大拐点的过渡阶段，随着增量政策不断落地，基本面会改善的……后续有望开启以信用周期重新上行为核心特征的年度级别的牛市行情！生物医药行业成长性强，持续关注！

Q: （沉默不语）（接入Wind API）（对分钟级数据回测）牛市拉升没跟上，看来之前的LSTM又要重新调参了。（导出基本面因子、量价因子）（遗传算法，特征工程）（Epoch 1 - Epoch 30）（反复炼丹）（再次回测）（自动交易）（紧盯）。

An Overview of Style Factors



Type	Examples
Size	Market Cap, Free-float Market Cap
Valuation	P/E, P/B, EBITDA
Earnings	ROE, Gross Margin
Growth	Earnings Growth Rate, Sales Growth Rate
Volatility	Historical Volatility
Momentum	X-Month Cumulative Return
Liquidity	Volume, Turnover





Project 01

000300.SH[沪深300] 2023/12/01 09:30 收 3490.50 幅 -0.16%[-5.70] 开 3494.22 高 3494.22 低 3490.41 换 0.00% 振 0.11% 额 36.86亿

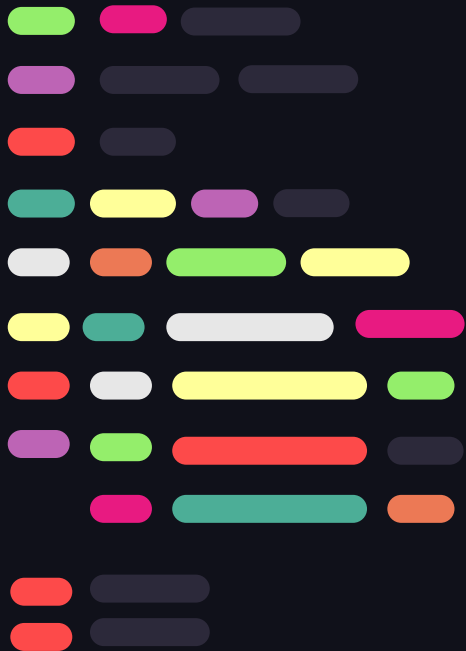
MA(5)=3496.23 MA(10)=3496.73 MA(20)=3497.54 MA(60)=3494.56

2023/12/01-2023/12/01 (220M)





Project 02



Calculate the CSI 300 Index (I) and get

$$\frac{I_{2024-09-27}}{I_{2024-09-30}}$$


Expected output:




















0.92




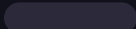














Order Book – Easy Ver.



	1				4	
	SELL	BID		OFFER	BUY	
	x 3				11	
		BID			BUY	
	8				25	
	SELL	BID		OFFER	BUY	
	8				27	
	SELL	BID		OFFER	BUY	









Order Book – Normal Ver.



沪铝2411

20880

15:00:00

卖五	20905	29
卖四	20900	86
卖三	20895	4
卖二	20890	26
卖一	20885	12
买一	20875	63
买二	20870	3
买三	20865	7
买四	20860	4
买五	20855	1



Matchmaking:

- Price Priority
- Time Priority





{ .. Looking forward...

α β

σ

IR

Σ

Sharpe Ratio

IC

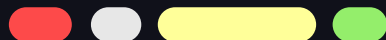
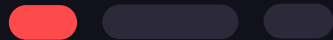


}

..



Project 03



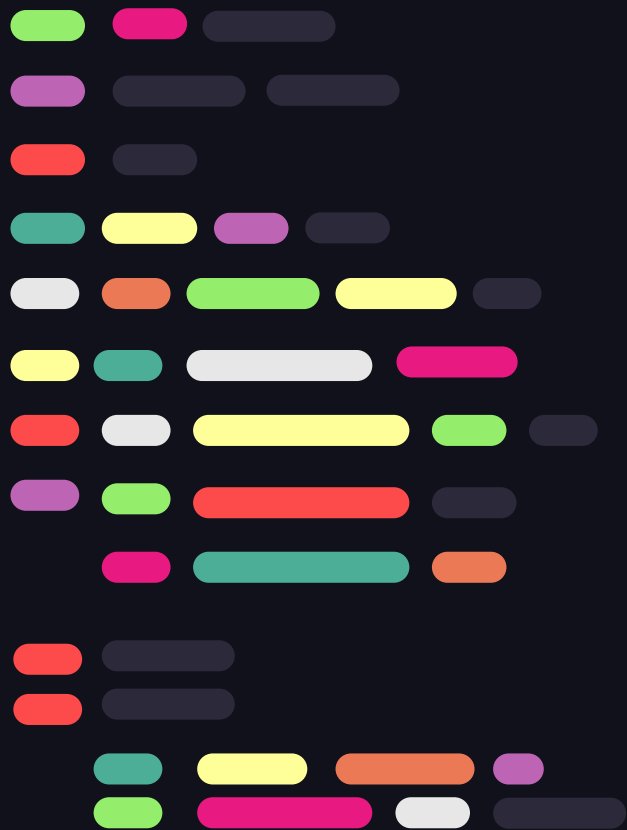
Find the *maximum drawdown* of the daily closing prices of the CSI 300 in history.

Return the value with its dates.

Expected output:

0.72 2007-10-16 2008-11-04





Thanks! }

CDA Tech Dept.

