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About me

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- Solution architect Microsoft Business Solutions @Inetum – Realdolmen
- Blogs:
  - https://jopx.blogspot.com
  - https://jopxfin.blogspot.com
- Twitter: @jopxtwits
- Got bored during Covid and started with Python

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The fine print

The information in this presentation represents an opinion and is for information purposes only. It is not intended to be investment advice. Seek a duly licensed professional for investment advice.

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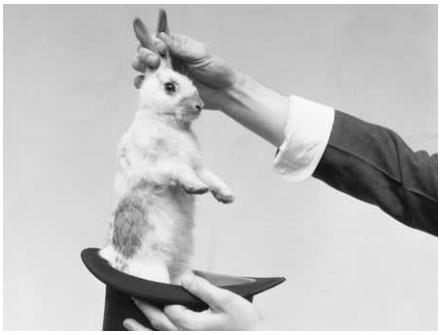
Objective

- Get you excited about investing/trading and data
- Get you thinking about quantitative/algorithmic trading
- Look at using Jupyter notebooks for trading/investing



What are we not covering?

- Crypto currencies, bonds, forex, derivative contracts (futures/options)
- Portfolio analysis and composition
- Usage of (advanced) machine learning algorithms
- The magic recipe

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Agenda

- Introduction to trading and finance
- Data first approach to trading
- Python, Anaconda and VS Code
- Quantitative trading system development process in Python examples
- Azure Machine Learning Service

https://github.com/jorisp/tradingnotebooks

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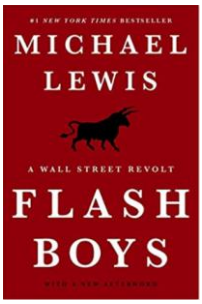
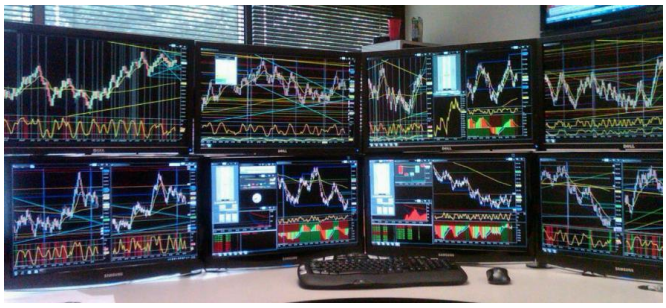
Trading vs investing





HFT trading → Day trading → Swing trading → Position trading → Investing

Milliseconds-minutes | Intraday | Few days to weeks | Weeks to months | Months to years …

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Word of warning: Efficient market hypothesis (EMH)

- EMH: Share prices reflect all information and consistently beating the market (adjusted for risk) is impossible (Fama and Samuelson, 1960)
- Active vs passive investing
- Criticisms:
  - Behavioral finance – systematic irrationality e.g. meme stocks (AMC and Gamestop), ;..
  - Many investors have consistently beaten the market
- https://www.youtube.com/watch?v=bM9bYOBuKF4

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So, do you believe that you can beat the market?

- Day Trading for a Living? by Fernando Chague, Rodrigo De-Losso, Bruno Giovannetti :: SSRN, (June, 2020) - 97% lost money
- The cross-section of speculator skill: Evidence from day trading (2013) – only 1% consistently beats the market

- What about smart money?
  - Over a 15-year period – 90% of actively managed funds failed to beat the market (Spiva 2020)

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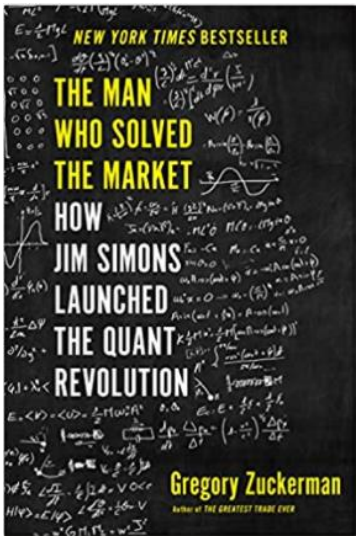
Data first approach towards trading

- RenTech – 66% average yearly return since 1988
- "There's no data like more data"(*)
- Quantitative or algorithmic trading
- Only 1 AI driven Belgian investment fund on the market - https://bit.ly/3mnLWAq



https://twitter.com/TrungTPhan/status/1424399014204637186?s=20

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Why Python?

[Python and Statistics for Financial Analysis (Coursera)]

- General purpose language
- Concise, expressive and readable
- Interactivity with Jupyter notebooks
- Massive open-source software development community
- First class citizen in the Data & AI world
- https://www.python.org/

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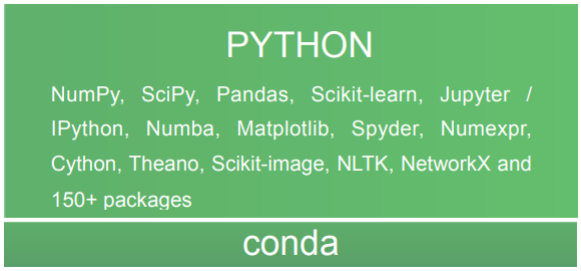

- Popular Python distro (150+ packages for data science)
- 25 M+ users
- Open-source individual edition - https://www.anaconda.com/products/individual
- **conda:** cross platform and language agnostic package and environment manager.
- **Environments:** custom isolated sandboxes with different versions of packages and/or python
- Conda sheat cheet - https://bit.ly/3liHtzU
- Be careful using both Pip and Conda

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Visual Studio Code Python extension

- Available in the extension marketplace
- Works on any OS
- Requires Python 3
- Features:
  - Syntax coloring
  - Code completion
  - Linting
  - Debugging
  - Code navigation
  - Code formatting
  - Jupyter notebook support

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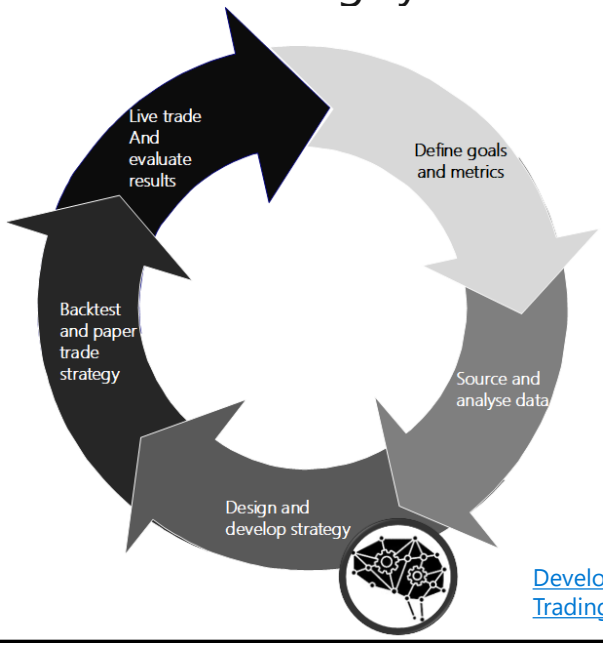
Quantitative trading system development process



- Non-linear process
- Extract signals to generate alpha
- Avoid investor bias and mistakes
- Risk vs return
- Back-testing framework

Development Process | Learning Path: Hands-On Algorithmic Trading with Python (oreilly.com)

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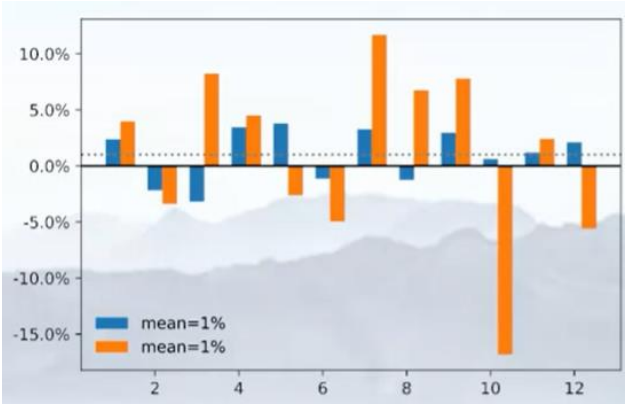
Risk and return

Goals and metrics of a trading/investment strategy



- Volatility as measure for risk
- Different metrics for comparing reward (return) to risk (standard deviation)
- Beta, Sharpe ratio, max drawdown, Sortino ratio, Calmar ratio, sterling ratio, …

Introduction to Portfolio Construction and Analysis with Python(Coursera)

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Demo2: Risk and return

Time for a live demo, what could wrong?

https://github.com/jorisp/tradingnotebooks/blob/master/riskratios.ipynb

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Source and analyze data
Types of data

Market data

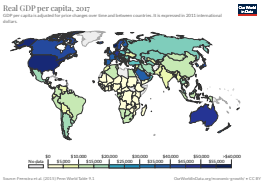
- OHLC
- Volume
- Market book

Technical indicators

- Derived from market data – (Exponential) Moving Average, Relative Strength Index, Moving Average Convergence/Divergence, …

Company data

- Revenue, debt financing, profit margin
- Ratios: PE, EPS, …
- Some gotchas to consider



Economic data

- GDP, inflation, interest rates, …
- Commodities
- Shipping prices
- …

Alternative data

- Non-traditional sources such as satellite imagery, social media activity, …
- Most hyped

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Source and analyze data
Where to find the data?

Market data
- yFinance
- Quandl (*)
- Alphavantage

Technical indicators
- Calculate yourself (Python TA-Lib)
- Alphavantage
- yFinance

Company data
- yFinance
- Alphavantage

Economic data
- Quandl
- World Bank
- St. Louis FED (FRED)
- Fama/French dataset

Alternative data
- Quiver Quantitative
- Build your own models e.g. NLP on earnings transcripts
- FSMA(**)

Pandas-datareader as wrapper library around multiple sources

Build a web scraper with Python and Beautiful Soup

(*) Quandl recently renamed to Nasdaq Data Link
(**) FSMA insider trading list https://www.fsma.be/en/transaction-search

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Design and develop a strategy

- Generating alpha
- Main strategies:
  - Momentum trading – "The trend is your friend (until it ends)
  - Mean reverting trading strategy
- SMA cross-over example

Quant	Momentum (time-series or cross-sectional)	Pair-trading, most types of statistical arbitrage	Advanced models (e.g. HMM, regime switching)	HF Market-making, Cash-futures arbitrage	News-based automated trading
Technical	MA cross-over, Continuation patterns	Swing, Retracement, Pivot trading	Opening range, dual thrusts, patterns	Range-based short gamma (vol selling)	Nothing much here
Fundamental	Factor-based investing	value investing	value/ RV (relative value) strategies	Cross-asset, cross country RV/ short gamma	Usually discretionary
	Trending	Mean-reverting	Break-out	Carry	Event-based

Quantinsti Youtube - https://bit.ly/3iLo352

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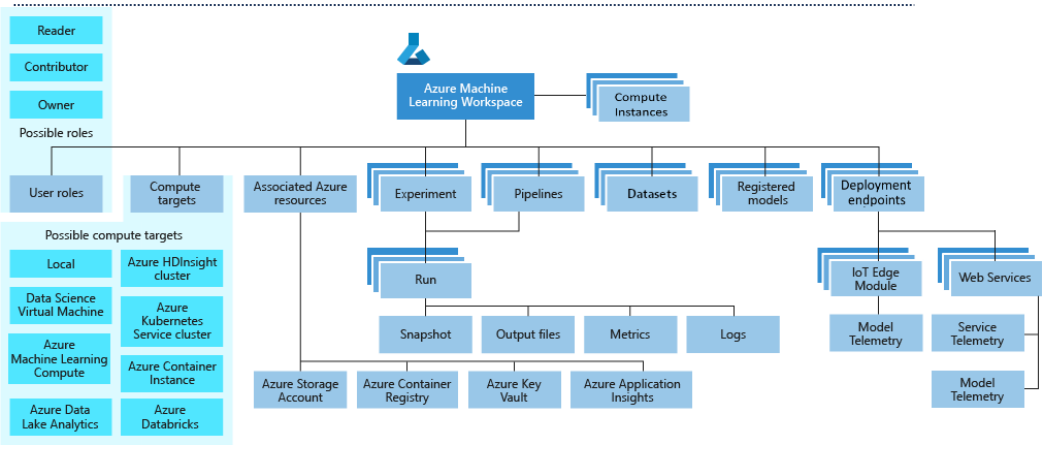
Azure Machine Learning service

Set of Azure Cloud Services + Python SDK



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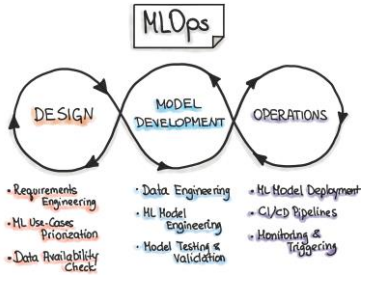
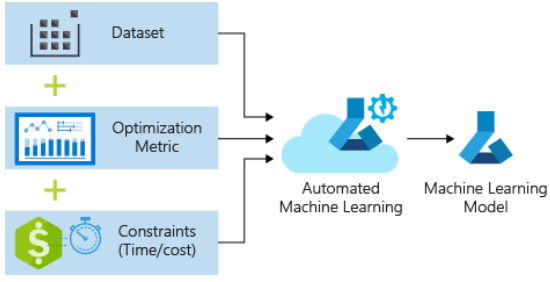
Azure Machine Learning Service

Key features





- Support MLOps process
- Track ML models with MLFlow (https://mlflow.org/) and AzureML
- AutoML - https://bit.ly/3v64bOX

- AutoML - https://bit.ly/3v64bOX

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Summary

- Start by building a foundational portfolio with index ETFs
- Diversify and spread out amounts to entering the market.
- Trading and building a trading system is a full-time activity
- No easy way to make money fast
- Python and Jupyter Notebooks easy solution to gather/transform/visualize information
- Use Azure when you need to scale or get started quickly (otherwise work locally)

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What do you think?

1.Open the form
2.Provide constructive feedback
3.Be eligible for an amazing prize

bit.ly is CASE SENSITIVE!

http://bit.ly/dMC2021_FeedbackTuesday

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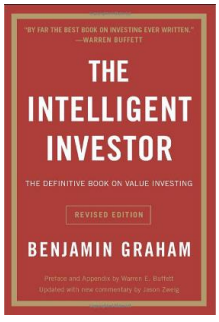
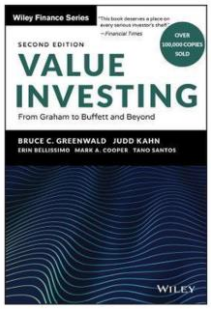
My favorite books on investing

- The intelligent investor, Benjamin Graham
- Verdubbel je geld in vijf jaar, Sam Hollanders
- God dobbelt niet op de beurs, Jan Longeval
- Value investing. From Graham to Buffett and Beyond, Bruce C. Greenwald





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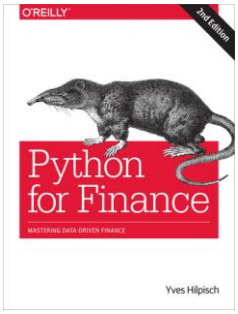
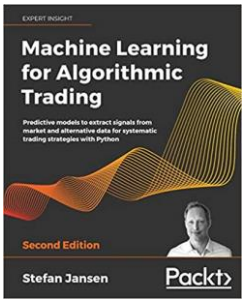
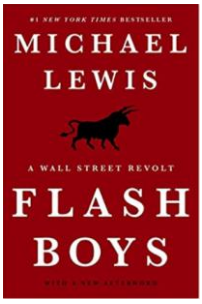
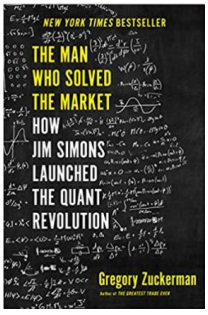
My favorite books on trading

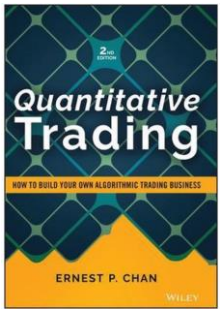
- Python for Finance, Yves Hilpisch
- Machine Learning for Algorithmic Trading, Stefan Jansen
- Flash Boys, Michael Lewis
- The man who solved the market, Gregory Zuckerman
- Quantitative trading: how to build your own algorithmic trading business (2nd edition), Ernest Chan











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- Chess Capital podcast – Alles over waardebeleggen - https://spoti.fi/301gXmj (NL)
- Inside Beleggen Podcast van Trends - https://spoti.fi/303EPFV (NL)
- De Beurs van Tegenwoordig (De Tijd) - https://spoti.fi/3mA4nly (NL)

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  - Coursera courses
- Python
  - https://docs.microsoft.com/en-us/learn/paths/python-first-steps/
  - https://aka.ms/python-getting-started
  - PyCon and PyVideo.org
  - Master the basics of Conda environments in Python - https://www.youtube.com/watch?v=1VVCd0eSkYc
  - https://realpython.com/beautiful-soup-web-scraper-python/
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- Sourcing data
  - Quiver Quantitative - https://www.quiverquant.com/ (Alternative financial data)
  - https://github.com/ranaroussi/yfinance
  - https://www.alphavantage.co/
  - https://data.nasdaq.com/ (Quandl)
  - https://mrjbq7.github.io/ta-lib/

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