Stock Trading vs Benji

Problem Statement:
Beat Benji at trading stocks using AI!

Overview

In this project, you'll dive into the world of algorithmic trading and machine learning with a twist - you'll be competing against our society's pet fish (Benji) making random trades! Inspired by the viral video from Michael Reeves ;)

This project involves building algorithms that can predict stock prices and using them to choose an investment strategy. Each team will submit a portfolio of stocks alongside some justification of their choices, which will then be evaluated in the real market! There are some additional rules listed below, including the pool of allowed stocks and some adjustments as well as a useful python notebook for getting started with retrieving and analysing stock data.

No one has ever beaten Benji at trading. Will you be the first!?

Some Inspiration

Here is an example for how a prediction pipeline could work:

1. **Data Ingestion**: Pull in and clean real or historical market data from free sources, setting it up for use in your algorithm. Use free resources, such as Yahoo Finance API or Kaggle datasets, to access historical stock market data.
2. **Feature Engineering**: Create useful features, such as moving averages, price trends, or volatility metrics, that help the model make informed trade decisions.
3. **Model Training**: Use Scikit-learn or PyTorch to build and train an ML model that adapts to trends in the data. Some strong model choices include LSTMs for processing time series data and decision trees for interpretable, feature based predictions.
4. **Backtesting**: Simulate your model's performance on historical data using custom-built backtesting functions in Python, with results that help you evaluate performance and make improvements.

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Resources

- [I Gave My Goldfish $50,000 to Trade Stocks](#) by Michael Reeves
- [Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow](#) by Géron A.
- [YouTube Series on Algorithmic Trading](#)
- ∞ **Goldfish vs AI - Getting Started.ipynb**

Extra Details

The list of eligible stocks can be found in this Stocks from ESGU .

Additional Rules:

We will be applying the following rules when testing your stock choices in the real market. You should include these in your modelling for accurate predictions.

- **Currency Conversion Impact**
  Algorithm Consideration: For every trade involving international stocks, incorporate an additional 0.30% round-trip cost (0.15% for buying and 0.15% for selling).

  Example: If investing £1,000 in a US stock, expect a £3 total fee due to currency conversion (£1.50 for buying and £1.50 for selling).

- **Adjust Returns for Dividend Tax**

  For dividend-paying stocks, teams should adjust their expected returns by 15% of the annual dividend yield if investing in US-listed companies.

Submission
Groups must submit their final stock selections by **Code Night of Week 1 Term 2** (we allow for late submissions but please let an exec know BEFORE THE DEADLINE). The exact date of code night will be decided closer to the time.
The submission should include:
- A list of the chosen stocks.
- A brief explanation of the rationale behind each selection.
- Any relevant data or analysis used to support the decisions.

Preferred Format for the Stock Choices:
Symbol,% of Portfolio
AAPL, 10
MSFT, 15
TSLA, 5

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