

Expression of Interest

Project Title	Backtesting and Optimisation of Stock Investment Strategies
Organisation or Supervisor	University of Nottingham
Contact person (sponsor)	Daniel Karapetyan
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Team Number:	29

Team Members

Name	Email Address
Vishal Pittala	psyvp2@nottingham.ac.uk
Alfie Rushby	psyar13@nottingham.ac.uk
Alan Stephen	psyas15@nottingham.ac.uk
Oliver Davy-Bowker	efyod1@nottingham.ac.uk
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Alexander Lockey	psyal6@nottingham.ac.uk

Description of Team Skills (You must provide clear evidence of to what extent the team has the Highly Desirable and where possible the Desirable Skills detailed on the Original Project form)

(750 words Max)

We find this project appealing because it aims to provide valuable insights into the complex game of stock trading. It is the perfect opportunity to employ computer modelling. Therefore, we are excited to apply comprehensive back testing to generate useful long-term investment guidance for users.

Our team has a good knowledge of statistics and a keen interest in the economy. Stock trading is a strong suit for Alan Stephen, who not only researched speculative markets during his Economics A-Level but also explored computer modelling in stock trading during his A-Level Computer Science project. Alan also has a wealth of statistics knowledge owing to his study of Further Mathematics and Further Statistics at A-Level. This ability in statistics is mirrored by our team members, with each of us having completed a statistics module during A-Level Mathematics or an equivalent program.

GUI design and development is also a strong area for our team, with each of us having created a modified version of Othello in Java using the Swing library. However, Alfie Rushby has a particular interest in GUI design. Alfie has an appreciation for consistent, clear, and intuitive GUI design, which he has exercised during his various computer game projects.

Working with data is a skill that all members of the team have displayed during the first year, especially during the Fundamentals of Artificial Intelligence module. The coursework piece for that module involved the application of machine learning techniques using the scikit-learn Python library. Although we all share this experience, Alan's knowledge is unmatched in our team given his background in data handling that he gained during his A-Level project.

Presently, TradingView seems to be the main application for backtesting, though it does require the knowledge of the Pine programming language to define stock strategies, making it unfriendly to some users. Bearing this in mind, we believe it would be best to suit the application towards a more amateur audience in order to fill the gap in the market. An audience such as this would most likely prefer more simpler indicators of success such as net profit / loss or Return.

Python presents itself to be the most suitable language for this project, given the simplicity of accessing stock data through its numerous APIs, such as "alpha-vantage", "googlefinance" and "yahoo-finance", yahoo finance seems to be our most reliable option due to its wide scale and reliability. Python is also a great option because of the accessibility of its GUI libraries, which provide a powerful prototyping platform and a visually appealing end-product. For the GUI, wxWidgets seems to be the best option, once designed on one system it can be used on other operating systems with little to no modifications; allowing a broader range of users to access it, additionally it provides a remarkably sleek-looking interface and comes with a rich variety of features.

Our plan is to follow an agile process, more specifically a mixture of the Kanban and SCRUM methodologies. This allows us to have team roles and sprints whilst also having the flexibility of Kanban. We intend to track progress and divide work in this project through these milestones:

1. Constructing a module to simulate the value of a non-static portfolio through existing data.
2. Producing a GUI to manage the stock strategies and to display the output of the simulation.
3. Having a system to define stock strategies.
4. Developing a system to consistently acquire data on stocks.
5. An implementation of automated parameter tuning.

To give us more flexibility, these milestones will not necessarily be completed in order. Some milestones can be completed in parallel with minimal method stubs, such as the production of the GUI, this allows for efficient development and specialisation of each member's skills.

We intend to work in 2-4-person sub teams, with complete transparency between each. This means, in the case that someone is incapable of work, there will not be an entire facet of development paused as other members pick up their tasks. If there are undiscovered requirements for which we do not have the skills to fulfil, we believe that we will be able to acquire those skills without heavy detriment to the project. We also believe our team is very skilled and efficient with researching given our grades during previous academic modules.

(Max 750 words)

Date of Submission of EoI	19 th of October 2022
Date of Pitch	26 th of October 2022
Notification of award	

Please make sure to submit a CV for each member of the team together with the EoI using the submission format available on Moodle.