School of Computing  
CA326 Year 3 Project Proposal Form

**SECTION A**

Project Title Building a Neural Network to predict Stock prices

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Student 3 Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ID Number \_\_\_\_\_\_\_\_\_\_\_

*(A third team member is exceptional and requires detailed justification.)*

Staff Member Consulted Rob Brennan

1. **Description:**

Our project is to build a neural network, to test the neural network we will use it to predict stock prices. The neural network will be built using Python 3. When attempting to predict stock prices there is little certainty of the price of stocks remaining steady, this issue can be combated by implementing a neural network as neural networks do require any stationarity to be used and are effective in finding the relationships between data and using it to predict new data or in this case predict stock prices. The data required for this project can be found and acquired quite easily using a python API, e.g. Yahoo finance API. The main goal of our project will be to understand and develop a neural network from scratch. We will start off by developing a simplistic neural network and at each iteration the model will build in complexity from the previous with the end goal of developing a long short-term model (LSTM), a type of recurrent neural network. LSTM has memory cells, by having the extra element of long-term memory, the network has data about the data in prior layers as memory which allows the model to find the relationships between the data itself. For this project we have chosen to use Adam as our optimizer as it has been designed specifically for training neural networks and combines the advantages of AdaGrad and RMSProp, two other extensions of stochastic gradient descent. For the stock price prediction we plan on predicting into the future within the selected time frame, showing the predicted percentage change. We will develop a user interface to present the neural network results which will allow the user to simply select which company stock that they would like to see predicted.

1. **Division of Work**

We will both work together on learning about and building the neural network as neural networks can be quite complicated.

The main areas of work include the following:

* Efficiently parsing stock data - Paul
* Developing neural network models - Janesh, Paul
* Feeding data into neural network models - Janesh, Paul
* Developing a user interface to display data output by the neural network model - Janesh

1. **Programming language(s)**

* Python 3

1. **Programming tool(s)**

* Pandas
* Yahoo Finance API
* numpy
* sklearn
* Gitlab
* Trello
* Atom editor

1. **Learning Challenges**

* Learn python modules such as pandas, numpy and sklearn.
* Learn how to develop a neural network from scratch.
* Learn more about long short-term models.
* Handling and cleaning large datasets

1. **Hardware / software platform**

* PC
* Linux
* Windows 10

1. **Special hardware / software requirements**

* No special requirements