Use review template for what point to cover

State hypothesis . . . run experiment to disprove your hypothesis

References for problem,

Our target audience is masters students in our class who have not taken the NC module

Am I trying to use genetic programming, algorithm or evolution . . .

# Abstract

# Introduction

Question being asked - would it be feasible

Objective – beat return on if you had bought one share and held for 15 years

An extension of the classic portfolio optimisation problem – without variance

Just need to code enough to show promise

Morgan Stanley using AI – becoming more and more popular

**Motivation**

**Background**

**Paper layout**

Lit review, problem description, proposed variation

Natural computing, genetic programming . . . at a level a bus analytics student could understand

What role would a ge or NC alg play in bus an

Significance of the problem . . . and in bus an

Why that algorithm

Problem statement/objective

Method/Alg/Variation

Specific GE algorithm that Pony uses?

## Natural Computing

## Short term trading strategies

There are sites to try out/execute: <https://www.quantopian.com>

Can a market be predicted? No but a strategy can work without deterministic market

Efficiencies - As the financial markets become more efficient, can trading strategies be developed from natural computing methods

## Neural Networks

What algorithm and why?

Nueral network will not show workings - intended to be a continually developing AI rather than a single use program

Intended as a continually evolving strategy that uses latest data rather than outputting a strategy to be analysed and implemented

Designed to be left alone - Argue that it can be left alone

Genetic programming would also be an ideal candidate

Neural network selected as it may be more advanced . . .

# Literary Review

Archived excel sheet only covers genetic programming

# Experiment

Question being asked - would it be feasible

Just need to code enough to show promise

Assumptions is that S&P companies do not change over time (they are updated . . .)

Fitness function

Simple is better

No cost of placing a trade

Not including variance but this could be included

my trades do not influence market

Trade on opening price everyday

Removed NaN cells from dataset

Setup and results

Frist experiment . . . . random buy/sell with probability 50% . .. . . Cash after 16 years:

Final result, cash remaining after 10000: 49376.2923

Site run times as a constraint and reasoning for simplifying

## Assumptions

Cover the point that model does not consider global/outside indicators and influencers

We do not need to show workings to execute . . . some banks may not like this

## Problem Description

## Experiment Results

# Discussion

Analyses

# Conclusion

Restate objective

Further research – add other variables, add ability to buy/sell portions not all, add hold option, two objectives – minimise variance

Refer back to objective . . . was it achieved

Think about presentation and visuals

# References

Need to cover:

Natural Computing

Particular algorithms

Examples of algorithm on different problem

Limitations of alg

Problem itself