UNIVERSITY OF SOUTHAMPTON COMP6212W1

SEMESTER 2 FINAL ASSESSMENT 2020/21

Computational Finance

This paper contains two sections.

Answer **All** questions in Section A**.**

Answer **Two** question in Section B

An outline marking scheme is shown in brackets to the right of each question.

5 page assessment paper

SECTION A

Answer ALL questions

Question A1

a) What benefits does "***Distributed Ledger Technology***" provide when developing a digital currency?

[10 marks]

b) What are the common ***user experience problems*** with smart contracts?

[7 marks]

c) Why is "***minimal design"*** important in developing smart contracts and how can you "***future proofing***" a smart contract?

[10 marks]

d) Using examples explain what are "**coloured coins"**?

[7 marks]

SECTION B

Answer *two* questions

Question B1

a) What is the difference between "***Fundamental analysis***" and "***Technical analysis***"?

[6 marks]

b) In the context of a portfolio, explain the relationship of ***variance***, ***risk***, ***covariance,*** and ***correlation***.

[12 marks]

c) Explain with the aid of a diagram what is meant by an "***effective frontier***" and how it may be used to select a portfolio.

[8 marks]

c) Describe in general terms how a "***Kalman filter***" is used in stock price prediction.

[7 marks]

Question B2

a) What are the advantage and disadvantage of "**automatic trading**", support your answer with an example?

[10 marks]

b) Explain how a "***Binomial Lattice***" works, with the aid of diagrams.

[9 marks]

c) How are the "***The Greeks***" used in computational finance?

[7 marks]

d) By using examples, explain a ***call/put parity***.

[7 marks]

Question B3

a) Give an overview of the use of machine learning for stock price prediction.

[7 marks]

b) Compare and contrast the statistical analysis and machine learning approaches in stock price prediction.

[12 marks]

c) Explain how "***Support Vector Machine"*** classification and regression can be used in stock price prediction.

[8 marks]

d) Explain how "***Exogenous variable****s"* can be used to aid machine learning in stock price prediction.

[6 marks]

END OF PAPER