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BSc Computer Science

**Module Title**

Machine Learning

**Assessment Title**

Project Final Report

**Assessment Weighting**

60% of the module mark

**Student Name**

Reece Turner (22036698)

James Burt (20016437)

Joseph Barnes (21033821)

**Group Number**

Group 23

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PREDICTING BITCOIN MARKET PRICES

*By James Burt, Josep Haines and Reece Turner.*

# ABSTRACT (200)

With Machine Learning and Finance intersecting in recent years, this study aims to bridge the gap between the subjects using ML models as the vehicle for accurately predicting Time Series data on Cryptocurrencies. We cover a range of Time Series Models such as Long Short-Term Memory (LSTM), Auto Aggressive Integrated Moving Average (ARIMA), and compare against others, to investigate how they perform on historical price data without being discriminate to a bias. Our Bitcoin dataset covers the last 4 years as a basis due to market conditions in recent years caused by COVID-19, recessions and the 2024 halving event. This makes it a perfect time to analyse and evaluate models by splitting the dataset into training, validation, and test sets. In doing so, we can investigate not only how the models learn and adapt to hyperparameters, but also evaluate each model’s ability to generalise unseen data. Our study will measure the performance by cost functions and mathematical proofs to further optimise predictions. This study uses supervised learning with performance bias checks, such as Mean Squared Error, to measure its applicability towards real world predictions with data coming from public Interfaces such as Yahoo Finance.

# INTRODUCTION

## The problem.

## Aims and objectives.

## Scope and results.

# RELATED WORK

# DATA

# METHODS

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# APPENDIX