Problem Chosen	2022 MCM/ICM Summary Sheet	Team Control Number
A		0000

The LaTeX Template for MCM Version v6.3.1

Summary

Keywords: keyword1; keyword2

The LaTeX Template for MCM Version v6.3.1

LaTeX Studio

February 21, 2022

Summary

Keywords: keyword1; keyword2

Contents

1 Introduction

1.1 Background

which means , to develop a model that uses only the past stream of daily prices to date to determine each day if the trader should buy, hold, or sell their assets in their portfolio.

1.2 Problem Statement

1.

2.

3.

4.

5.

6. Determine how sensitive the strategy is to transaction costs

1.3 Problem Analysis

ARIMA ARIMAARIMA

2 Assumption

3 Data Processing

3.1 Data Screening

We analyzed the raw data in the LBMA-GOLD.csv and BCHAIN-MKPRU.csv files,final data status is as follows:

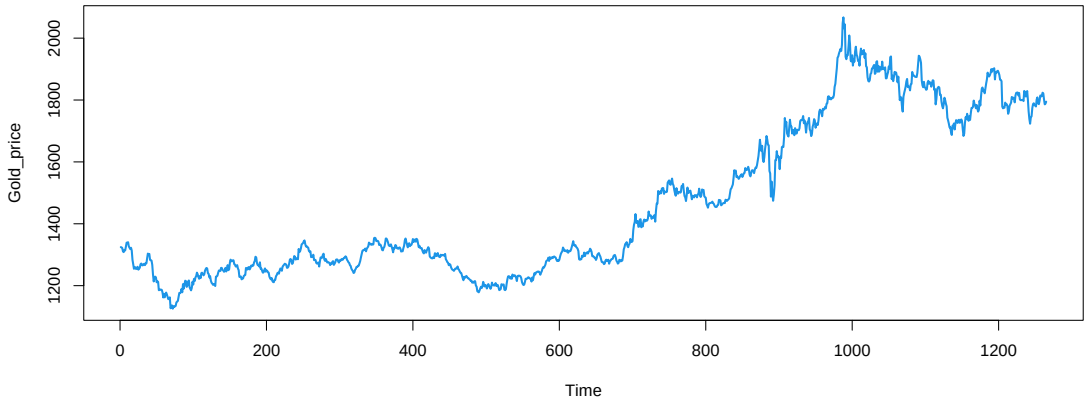
For the missing data in LBMA-GOLD.csv, we fill in the date according to the average of the day before and the day after.

3.2 Data Visualization

To observe the price trends of gold and bitcoin more visually, we visualize the given data and draw figure1and2

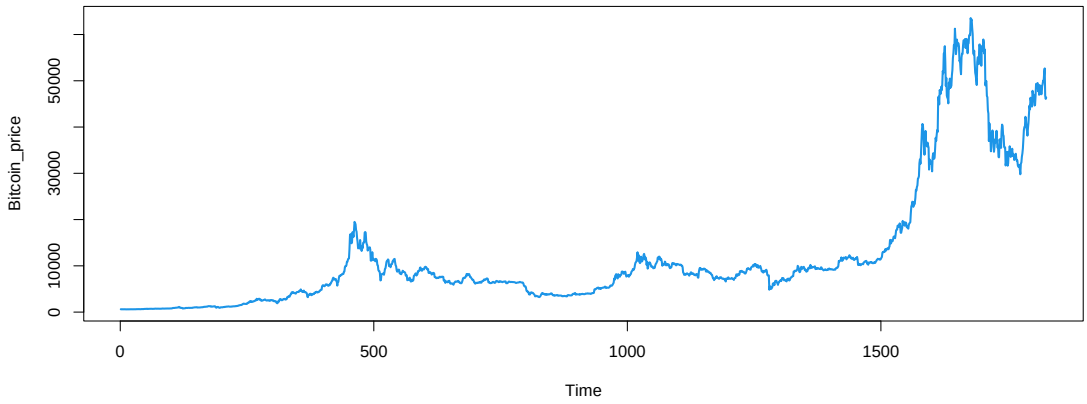
3.3 Mining Time Series

For subsequent data prediction using the time series model ARIMA, We perform stability test and white noise test on the raw data and processed data as a way to mine meaningful time series.



(a) 1

Figure 1: Gold price tendency



(a) 2

Figure 2: Bitcoin price tendency

3.3.1 Stability Test

First,we test the stability of the original data by comparing two methods, the image observation and the unit root test.

Testing unit rootand result is shown below:

Secondly,the first-order difference data is obtained according to the first-order difference of the original data, and the two methods abrove are also used to test.The result is as follows.4

Thirdly,utilizing second order difference we obtained second order difference data with two methods testing The result is shown in5.

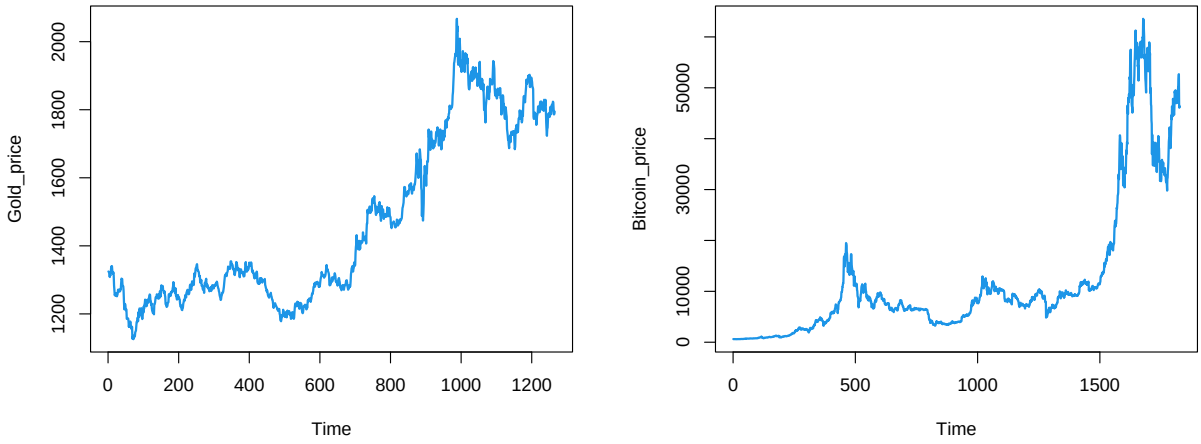


Figure 3: Raw data visualization

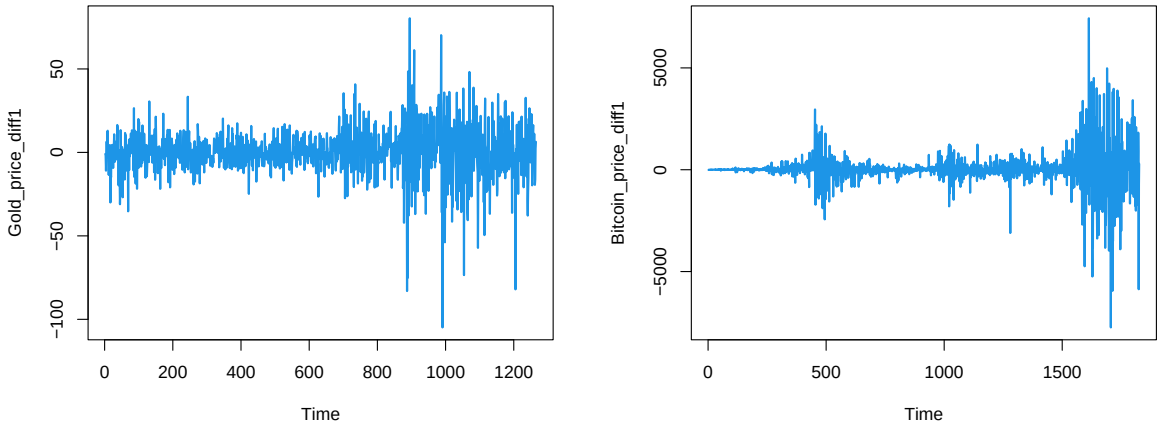


Figure 4: first order difference data

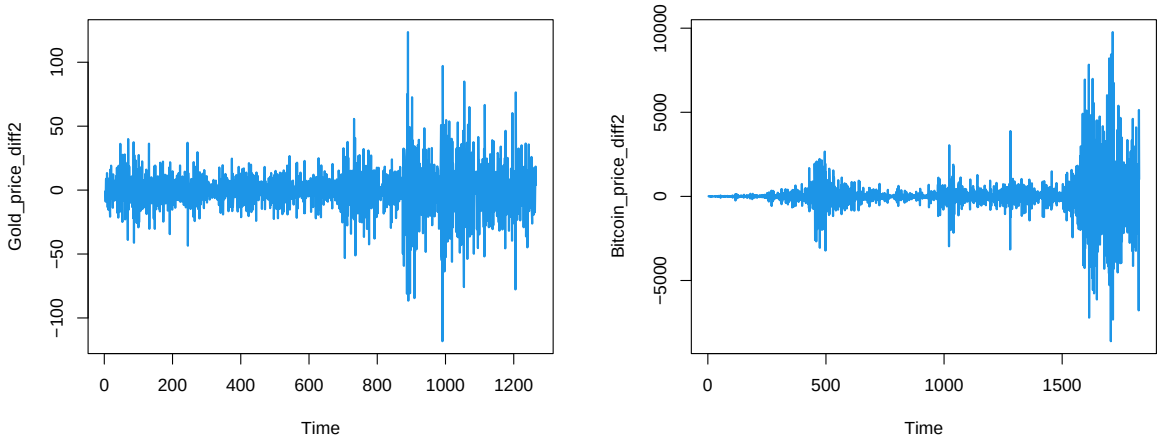


Figure 5: second order difference data

3.3.2 White Noise Test

4 PartModel Development

4.1 Time Series Model ARIMA - Data Forecasting

4.1.1 Train the Model With All the Data

4.1.2 Model Validating

4.1.3 Model Prediction and Visualization

4.1.4 Batch prediction of data

4.2 Investment Decision Model - Dynamic Programming

4.2.1 Buy and Sell Standard Setting

4.2.2 Portfolio Optimal Ratio Identification

4.2.3 Positioning Standard Identification

4.2.4 Daily Portfolio Determinations

5 Part:Strategy Evaluation

5.1 Set Perturbation Terms

5.2 Comparison Illustrates the Best Strategy

6 Part:Sensitivity Analysis

6.1 Assuming Changes In Commission

6.2 Visualization Results

7 Evaluate of the Model

[2] Lamport, Leslie, LaTeX: " A Document Preparation System ", Addison-Wesley Publishing Company, 1986.

[3] https://www.latexstudio.net/

Appendices

Appendix A First appendix

In addition, your report must include a letter to the Chief Financial Officer (CFO) of the Goodgrant Foundation, Mr. Alpha Chiang, that describes the optimal investment strategy, your modeling approach and major results, and a brief discussion of your proposed concept of a return-on-investment (ROI). This letter should be no more than two pages in length.

Dear, Mr. Alpha Chiang

Sincerely yours,

Your friends

Here are simulation programmes we used in our model as follow.

Input matlab source:

```
function [t,seat,aisle]=OI6Sim(n,target,seated)
pab=rand(1,n);
for i=1:n
    if pab(i)<0.4
       aisleTime(i)=0;
    else
        aisleTime(i)=trirnd(3.2,7.1,38.7);
    end
end
```

Appendix B Second appendix

some more text **Input C++ source:**

```
//============================================================================
// Name        : Sudoku.cpp
// Author      : wzlf11
// Version     : a.0
// Copyright   : Your copyright notice
// Description : Sudoku in C++.
//============================================================================

#include <iostream>
```

```
#include <cstdlib>
#include <ctime>

using namespace std;

int table[9][9];

int main() {

    for(int i = 0; i < 9; i++){
        table[0][i] = i + 1;
    }

    srand((unsigned int)time(NULL));

    shuffle((int *)&table[0], 9);

    while(!put_line(1))
    {
        shuffle((int *)&table[0], 9);
    }

    for(int x = 0; x < 9; x++){
        for(int y = 0; y < 9; y++){
            cout << table[x][y] << " ";
        }

        cout << endl;
    }

    return 0;
}
```