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Perlis Branch
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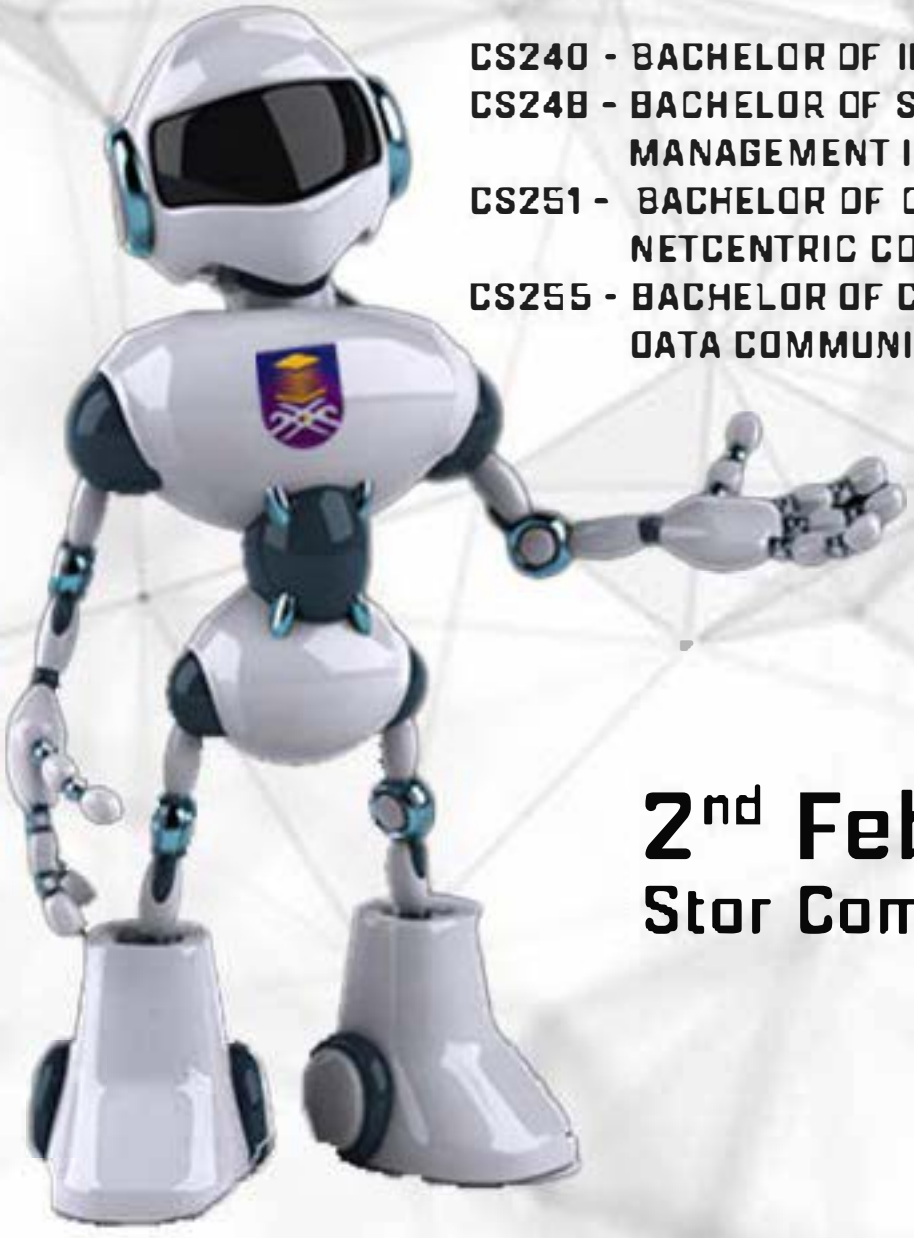
RESEARCH EXHIBITION IN MATHEMATICS & COMPUTER SCIENCES

REMACS 5.0



CS240 - BACHELOR OF INFORMATION TECHNOLOGY (HONS.)
CS248 - BACHELOR OF SCIENCES (HONS.)
MANAGEMENT IN MATHEMATICS
CS251 - BACHELOR OF COMPUTER SCIENCE (HONS)
NETCENTRIC COMPUTING
CS255 - BACHELOR OF COMPUTER SCIENCE (HONS)
DATA COMMUNICATION & NETWORKING

2nd Februory 2023

Stor Complex, UiTM Perlis

Organized by:
College of Computing, Informatics and Media
Universiti Teknologi MARA Perlis Branch

Research Exhibition in Mathematics and Computer Sciences (REMACS 5.0)

Research Exhibition in Mathematics and Computer Sciences (REMACS 5.0)

Editors
Rafiza Ruslan, Mohamad Najib Mohamad Fadzil, Noorfaizalfaird Mohd Nor, Mohammad Hafiz bin Ismail

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Preface

It is with great pleasure that we present this extended abstract book, titled "The 5th Research Exhibition in Mathematics and Computer Sciences (REMACS 5.0)". This book is a collection of research work in the fields of Computer Science and Mathematics, contributed by the final year students from Universiti Teknologi MARA, Perlis Branch. The aim of this book is to showcase the diversity and depth of research in these two interrelated fields.

Mathematics and Computer Science are two fields that have seen tremendous growth and advancement in recent years. With the rise of new technologies and the increasing demand for data-driven solutions, researchers in these fields have been working hard to develop new theories, algorithms, and models that can help solve some of the most pressing problems of our time. This book is a testament to their hard work and dedication.

The abstracts in this book cover a wide range of topics, including algebra, analysis, logic, computer architecture, algorithms, artificial intelligence, machine learning, computer network, netcentric computing and many more. The work presented here is both theoretical and practical, and has the potential to impact many areas of society, from finance and healthcare to education and security.

We hope that this book will serve as a valuable resource for future students in the fields of Mathematics and Computer Science. We also hope that it will inspire more students to pursue innovative and groundbreaking research in these two fields. Finally, we would like to express our gratitude to all the contributors for their hard work and dedication, without which this book would not have been possible.

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EVENT SCHEDULE

8:00 – 8:30 am
•Registration

8:00 am – 12:00 pm
•FYP Project Presentation

12:00 - 2:00pm
•Lunch Break

2:15 – 2:35 pm
•National & Wawasan Setia Anthems
•Doa Recitation

2:35 – 2:45 pm
•Welcoming Address by Director of REMACS 5.0

2:45 – 2:55 pm
•Officiating & Closing Remarks from Rector of UiTM Perlis

2:55 – 3:00 pm
•REMACS 5.0 Montage

3:00 – 4:00 pm
•Awarding of Winners:
•Best Poster
•Best Project Award

•Photo Session

•End of Ceremony

Dress Code: Formal / Corporate

List of Papers

RESEARCH EXHIBITION IN MATHEMATICS & COMPUTER SCIENCES

REMACS 5.0

EXTENDED ABSTRACTS

FORECASTING UNEMPLOYMENT RATE IN MALAYSIA: COMPARISON BETWEEN ARIMA AND FUZZY TIME SERIES

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Abstract

According to Malaysia Labour Force Survey, the definition of unemployed is the person who was available for work but did not work during a reference period. Unemployment occurs when a person is available for work and actively looking for work but cannot find one. As unemployment is a gauge of economic health, a higher unemployment rate will negatively affect the labour market. In 2020, a new virus known as Coronavirus spread all through the world. According to the World Health Organization (2020), Covid-19 began as a localized health crisis but quickly became a global health crisis with severe economic consequences. Regarding Malaysia Informative Data Centre (MysIDC), the unemployment rate in Malaysia has rosily increased by 1.3% from 3.3% in 2019 to 4.6% in 2021. It will affect the country if it keeps increasing for the following year. Because of that, this study wanted to find the best model to forecast the unemployment rate. This study focused on the unemployment rate in Malaysia from 1982 to 2021. Two models; ARIMA and Fuzzy Time Series, will be used to determine which is better for forecasting by finding the minor error value. The result shows that the ARIMA (1,1,0) model better forecasts the unemployment rate than Fuzzy Time Series since it shows the smallest value for MAPE and MSE.

Keywords*: ARIMA, Forecast, Fuzzy Time Series, unemployment rate*

1. Introduction

The unemployment issue is one of the most common problems faced by many countries worldwide. When the country has inflation or any crisis, it will affect the company in that country. During the pandemic because of Covid-19, the Malaysian government imposed a Movement Control Order (MCO) to control the outbreak. As a result, many companies are allowing employees to work from home and some of the employees lost their jobs because the corporations wanted to minimize operational expenses. Hence, the study's primary goal is to find a suitable model to predict the unemployment rate in Malaysia. This study used secondary data of the unemployment rate in Malaysia from 1982 to 2021.

2. Methodology

The secondary data were collected from the government website (MysIDC). This study compares ARIMA and Fuzzy Time Series models toward the unemployment rate in Malaysia. Two error measures, Mean Square Error (MSE) and Mean Absolute Percentage Error (MAPE), were used to evaluate the best model to predict the unemployment rate. Firstly, the unemployment data were analyzed using the ARIMA model. We ran five possible ARIMA models and verified that ARIMA (1,1,0) is the best model due to the Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC). In the second step, the data was analyzed using Fuzzy Time Series and got the error measure value. Lastly, we compared the ARIMA and Fuzzy Time Series model using the error measure obtained. The model with the lowest value of error measure indicates the best model to predict the unemployment rate in Malaysia.

3. Results and Discussion

The result found that the MSE and MAPE for the ARIMA model are 0.1491 and 7.1549, respectively. While Fuzzy Time Series results showed that MSE 0.2519 and MAPE 12.4772. Based on a comparison for the model of ARIMA and the Fuzzy Time Series, both error measure value for the ARIMA model is lower than Fuzzy Time Series. Therefore, it concludes that the Arima model is the best model to forecast the unemployment rate in Malaysia.

4. Novelty of Research / Product

A few studies have conducted the study case about the unemployment rate in Malaysia but using different models. Wang (2009) used Artificial Neural Network to forecast the unemployment rate in China and found that neural network is okay in predicting but hard to choose one to do the work. S. F. Ramli et al., (2018), compared ARIMA and Holt's Exponential Smoothing Method. They discovered that ARIMA (2,1,2) model is the best model compared with Holt's method. Dritsaki (2020) studied the unemployment rate in Greece using Sarima Model and concluded that the forecast value's result.

5. Conclusion

The main objective of this research is to find a suitable model to use to predict the unemployment rate is achieved. The best model to use is ARIMA (1,1,0) which has the smallest value among the other models. Since ARIMA (1,1,0) is the suitable method, the Malaysian Government can use this model to predict the rate of the unemployment rate for 2023.

REFERENCE LIST

Dritsaki, C. (2020). *Forecast of Sarima Models : A n Application to Unemployment Rates of Greece Related papers Forecast of Sarima Models : A n Application to Unemployment Rates of Greece*. https://doi.org/10.12691/ajams-4-5-1

Hanapi, Z., & Nordin, M. S. (2014). Unemployment among Malaysia Graduates: Graduates'Attributes, Lecturers' Competency and Quality of Education. *Procedia - Social and Behavioral Sciences*, *112*(Iceepsy 2013), 1056–1063. https://doi.org/10.1016/j.sbspro.2014.01.1269

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