

Universiti Teknologi MARA

**FORECASTING THE AIR POLLUTION
INDEX USING ARTIFICIAL NEURAL
NETWORK AT MUAR, JOHOR,
MALAYSIA**

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**Report submitted in fulfillment of the requirements
for Bachelor of Science (Hons.) Management
Mathematics Faculty of Computer and Mathematical
Sciences**

July 2020

STUDENT'S DECLARATION

I certify that this report and the research to which it refers are the product of my own work and that any ideas or quotation from the work of other people, published or otherwise are fully acknowledged in accordance with the standard referring practices of the discipline.



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AUGUST 5, 2020

ABSTRACT

Clean and quality air is an essential element in maintaining a healthy quality of life. Air pollution is a serious issue that should be addressed by everyone around the world as it is one of the most important factors contributing to the quality of life and the environment. In addition, there is a simple way to describe the air quality known as Air Pollution Index (API). With the index reference reading system, the API can easily detect changes in air quality. This study mainly focuses on forecasting the Air Pollution Index. In this study, secondary data was used which is obtained from the Department of Environment (DOE) regarding the Air Pollution Index in Malaysia. The dataset is the daily dataset Air Pollution Index (API) at Muar, Johor, Malaysia. The data is taken from the 1st of January 2015 to the 31st of December 2015. The method that was used in this study named Artificial Neural Network (ANN). Warren McCulloch and Walter Pitts developed this model by constructing a neural network computer model based on algorithms and mathematics and they are known as threshold logic. This study shows that ANN was conducted using the software named R Studio. It is shown that ANN was more accurately to be used as a forecasting method and to improve the accuracy of the forecasting compare to Naïve, Mean and ARIMA model using the lowest measures error which are Mean Error (ME), Root Mean Squared Error (RMSE), Mean Absolute Error (MAE), Mean Absolute Percentage Error (MAPE), and Mean Absolute Scaled Error (MASE). Besides, this study may also help the public to know the forecasted value API for the next three days.

Keywords: ANN, API, Naive, Mean, ARIMA, ME, RMSE, MAE, MAPE, MASE

TABLE OF CONTENTS

CONTENTS	PAGE
SUPERVISOR’S APPROVAL	ii
DECLARATION	iii
ACKNOWLEDGEMENT	iv
ABSTRACT	v
TABLE OF CONTENTS	vi
LIST OF FIGURES	viii
LIST OF TABLES	ix

CHAPTER ONE: INTRODUCTION

1.1	Background of the Study	1
1.2	Problem Statement	3
1.3	Objective of the Study	4
1.4	Scope of the Study	4
1.5	Significance of the Study	4

CHAPTER TWO: LITERATURE REVIEW

2.1	Introduction	6
2.2	Air Pollution Index (API)	6
2.3	Overview of Past Research of API	7
2.4	Artificial Neural Network (ANN)	9
2.5	Summary	11

CHAPTER THREE: RESEARCH METHODOLOGY

3.1	Method of Data Collection	12
3.2	Method of Data Analysis	12
3.3	Method of Artificial Neural Network (ANN)	13

CHAPTER FOUR: RESULTS AND DISCUSSIONS

4.1	Introduction	17
4.2	Artificial Neural Network (ANN)	18

CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS

5.1	Conclusions	24
5.2	Recommendations	25

REFERENCES		26
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