

UNIVERSITI TEKNOLOGI MARA

TECHNICAL REPORT

**PERPETRATORS PROFILING BASED ON
VICTIMS ATRIBUTES USING LOGISTIC
REGRESSION MODEL**

P14M19

**SITI NURZATIHAH BINTI MOHAMAD AZMAN
NOR EMILIYA FATIN BINTI AMBERI
NUR FARAH AMIRA BINTI MUSTAPPA KAMAL**

**Bachelor of Science (Hons.) Management Mathematics
Faculty of Computer and Mathematical Sciences**

JULY 2019

UNIVERSITI TEKNOLOGI MARA

TECHNICAL REPORT

**PERPETRATORS PROFILING BASED ON
VICTIMS ATRIBUTES USING LOGISTIC
REGRESSION MODEL**

P14M19

**SITI NURFATIHAH BINTI MOHAMAD AZMAN
NOR EMILIYA FATIN BINTI AMBERI
NUR FARAH AMIRA BINTI MUSTAPPA KAMAL**

**Report submitted in partial fulfilment of the requirement
for the degree of
Bachelor of Science (Hons.) Management Mathematics
Faculty of Computer and Mathematical Sciences**

JULY 2019

TABLE OF CONTENT

ACKNOWLEDGEMENT	II
TABLE OF CONTENT	III
LIST OF FIGURES	IV
LIST OF TABLES	IV
ABSTRACT.....	V
1.0 INTRODUCTION	1
1.1 Problem Statement	2
1.2 Objectives	2
1.3 Scope	2
1.4 Significance of the Study	3
1.5 Definition of Terms and Abbreviations.....	3
2.0 LITERATURE REVIEW	4
2.1 Historical Background of Offender	4
2.2 Factors of Environmental That Influence the Motif of Offender	5
2.3 Crime’s Mathematical Modelling.....	6
3.0 METHODOLOGY AND IMPLEMENTATION	8
3.1 Data Collection	8
3.2 Testing of variables	13
3.2.1 Omnibus Test.....	13
3.2.2 Wald Statistic.....	14
3.3 Mathematical Modelling for Criminal Profiling	16
3.3.1 Binomial Logistic Regression Model.....	16
3.3.2 Multinomial Logistic Regression Model.....	18
4.0 RESULT AND DISCUSSION	19
4.1 Wald Statistic and Omnibus test	19
4.2 Binomial Logistic Regression Model	22
4.3 Multinomial Logistic Regression Model	25
5.0 CONCLUSIONS AND RECOMMENDATIONS	27
5.1 Conclusion	27
5.2 Recommendation.....	27
REFERENCES	28
APPENDIX A.....	30

APPENDIX B	32
------------------	----

LIST OF FIGURES

Figure 1: Relationship between offender and victim for binomial categories.....	8
Figure 2: Relationship between offender and victim for multinomial categories	9
Figure 3: Relationship between victims and offender (Strangers and Unknown) for year 2004 until 2007	12

LIST OF TABLES

Table 1: Gender of Offender and Victims for year 2004 until 2007	9
Table 2: Race of Victims and Offender for year 2004 until 2007	10
Table 3: Weapon that used by offender for year 2004 until 2007	10
Table 4: Relationship between victims and offender (Biological) for year 2004 until 2007.....	11
Table 5: Relationship between victims and offender (Non-Biological) for 2004 until 2007.....	11
Table 6: Relationship between victims and offender (Acquaintance) for year 2004 until 2007	12
Table 7: Result for Omnibus Test and Wald Statistics.....	15
Table 8: Multinomial Logistic Regression Model SPSS output.....	18
Table 9: Binomial Logistic Regression Model SPSS output.....	19
Table 10: Odds ratio for the independent variables according to years.....	22
Table 12: Odds ratio for the victims and offender age according year.....	23
Table 13: Odds ratio for the weapon used by the offenders to commit crime according year.....	24
Table 14: Odds ratio of independent variables according to years	25

ABSTRACT

Nowadays people always read about criminal such as raping, killing, robbery and others especially among people who are have relationship with offender. Murder or rape is one of common criminal that people often heard in news because these numbers of cases are increase every day. In order to solve the crime, forensic department and police will cope together. Additionally, there is a lack of research about victims and offender relationship when it comes to solving the crime and not all mathematical method can give the absolute answer to calculate the perpetrators profiling. The objectives of this research are to calculate the probability of relationship between victims and offender of the murder cases using Logistic Regression Model and to the determined whether the model is suitable to be used to analyze the data. In this research, there are two types of logistic regression that are use which are binomial and multinomial. For the binomial, there are two categories of dependent variable only and four categories of dependent variables for multinomial regression. The result from shows that the R^2 the model is less than 60 percent. Even though the R^2 is not significant but there are a few tests that are significant such as Omnibus and Wald test. Therefore, this method is still valid to use to analyse the data set. For the recommendation data can be analyze by using other model such as Association Rule Mining (ARM) because ARM is one of the models that can show the relationship between data items and large data set in various type of database.