

# **Configuration Manual**

MSc Research Project Data Analytics

Laksana Vongchalerm X19101538

School of Computing National College of Ireland

Supervisor: Vladimir Milosavljevic

#### National College of Ireland

#### **MSc Project Submission Sheet**



#### School of Computing

Student Name:	Laksana Vongchalerm
Student ID:	X19101538
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Supervisor:	Vladimir Milosavljevic
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Word Count:	

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## **Configuration Manual**

#### Laksana Vongchalerm X19101538

### **1** Introduction

The configuration manual provides information about software were applied in the research project. Furthermore, screenshots and descriptions from the codes and outputs.

### 2 Data Set

The dataset is collected from UCI Machine Learning Repository as a CSV file. After downloading the file, it was imported into R Studio to solve the missing data.

#### **3** Hardware Requirements

The project was used to perform artefacts as below.

Operating System	Windows 11
Processor	Intel Core i5-10210U CPU @ 1.60GHz 2.11 GHz
RAM	8 GB
Memory	500 GB

#### 4 R Studio

The dataset is collected from UCI Machine Learning Repository as a CSV file. After downloading the CSV file, it was imported into R Studio to adjust the empty data. Figure 1 shows that the screenshot in R Studio.

```
setwd("D:/Work/R")
File[is.na(File)] = "unknown"
write.csv(File,"File.csv", row.names = FALSE)
View(File)
```

Figure 1: Missing Data

### 5 IBM SPSS Statistics

IBM SPSS Statistics is software that assists initial data analysis. After solving the empty data, we used the new file to import into the IBM SPSS Statistics to consider the missing data as an unknown.

### **6** WEKA Application

We used WEKA to do the imbalance data and create models like Logistic Regression and Decision Tree.

- Weka GUI Chooser Х \_\_\_\_ Program Visualization Tools Help Applications Explorer Experimenter The University of Waikato KnowledgeFlow Workbench Waikato Environment for Knowledge Analysis Version 3.8.5 (c) 1999 - 2020 Simple CLI The University of Waikato Hamilton, New Zealand
- 6.1 Open WEKA Application and click at the Explorer button.

Figure 2: WEKA Application

6.2 Click Open files > select the dataset > Open. The application shows WEKA interface, and the data is imbalance.

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Figure 3: Select dataset

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Figure 4: WEKA application interface

6.3 To solve the imbalance data, click choose > filters > supervised > Instance > SpreadSubsample. The application displays the balance data.

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Figure 5: Balance Data

6.4 After the data is balanced, select the Classify tab and then choose the machine learning algorithm. In this paper selected Logistic.

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Figure 6: Selecting the machine learning algorithm: Logistic Regression

6.5 Confirmation to select the machine learning algorithm by clicking the Start button then the application shows the results. Figure 8 shows the results of Logistic Regression with the AUC (Area under ROC Curve) was 93.4%, with precision and recall values of 87% and 86.9%, respectively.

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Figure 7: Confirmation the machine learning algorithm: Logistic Regression

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(Nom) y	Total Number of Instances 9280			
Result list (right-click for options 21:49:35 - functions.Logistic	TF Rate         FP Rate         FP recision         Recall         F-Measure         MCC         RCC Area         PRC Area         Class           0.851         0.112         0.884         0.851         0.867         0.739         0.934         0.948         no           0.888         0.149         0.856         0.872         0.739         0.934         0.906         yes           Weighted Avg.         0.869         0.131         0.870         0.869         0.739         0.934         0.927			
	=== Confusion Matrix === a b < classified as 3947 693   a = no 519 4121   b = yes			
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Figure 8: Logistic Regression result

6.6 For decision tree, select the Classify tab and then choose the machine learning algorithm. In this case selected trees > J48

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Figure 9: Selecting the machine learning algorithm: Decision Tree

6.7 Confirmation to select the machine learning algorithm by clicking the Start button then the application shows the results. Figure 11 shows the results of Decision Tree with the AUC (Area under ROC Curve) was 86.6%, with precision and recall values of 84.4%.

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Figure 10: Confirmation the machine learning algorithm: Decision Tree

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22:40:24 -	trees.J48				0.851	0.162	0.840	0.851	0.845	0.689	0.866	0.813	yes			
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Figure 11: Decision Tree Result

6.8 The most performance was Logistic Regression and then used the model to find the ranking by clicking the Select attributes tab and set the parameter as Figure 12. After set the parameter, click the Start button. The application shows the ranking as Figure 12.

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			0.189 +- 0.002	5 +- 0	20 pr.employed				
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			0.044 +- 0.001	11 +- 0	8 contact				
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Figure 12: Ranking Attributes