PROJECT REPORT
HUNGARIAN ALGORITHM USING
STORED PROCEDURE

DAVID KURNIAWAN SUSILO
13.02.0038

Faculty of Computer Science
Soegijapranata Catholic University
2017
APPROVAL AND RATIFICATION PAGE

HUNGARIAN ALGORITHM USING STORED PROCEDURE

by

DAVID KURNIAWAN SUSILO - 13.02.0038

This project report has been approved and ratified by the Faculty of Computer Science on July, 12, 2017

With approval,

Supervisor,

Hironimus Lestari, S.Kom., M.Kom
NPP: 058.1.2007.273

Examiners,

1.) Rosita Herawati, ST., M.T
NPP: 058.1.2004.263

2.) Shinta Fadli Widyuningrum, S.Si., M.Cs
NPP: 058.1.2007.272

3.) Suyanto E.A., Ir., M.Sc

Faculty of Computer Science,

Erdi Widyarto Nugroho, ST., MT
NPP: 058.1.2002.254
STATEMENT OF ORIGINALITY

I, the undersigned:

Name : DAVID KURNIAWAN SUSILO
ID : 13.02.0038

Certify that this project was made by myself and not copy or plagiarize from other people, except that in writing expressed to the other article. If it is proven that this project was plagiarizes or copy the other, I am ready to accept a sanction.

Semarang, July, 12, 2017

[Signature]

DAVID KURNIAWAN SUSILO
13.02.0038
ABSTRACT

There are workers, jobs, and the costs data. They are mapped into table. One worker will do one job with the costs that have been noted. From the costs that have been noted, they are not optimal costs. So it needs to find the minim costs as the optimal costs. To find the minim costs with many workers and jobs data by manual computing is difficult. So it is offered Hungarian Algorithm to solve it.

Hungarian Algorithm works by mapping the workers, jobs, and costs data into table. The row and column in the table will be normalized and eliminated. The processes are looped iteratively until find the most minim costs.

The result from normalizing and eliminating row and column in table will be found the optimal costs from workers and jobs data.

Keyword: hungarian algorithm, stored procedure, assignment problem
PREFACE

This project is about making program to solve assignment problem by Hungarian algorithm with the optimum costs.

Hungarian algorithm is a combinatorial optimization algorithm that solves the assignment problem. It consists of a set of operations applied to a square matrix whose cells values are a function of the cost of assigning the job to the worker.

The assignment problem's data consists of workers, jobs, and costs. The data will be inserted into table in MySQL. While the Hungarian's process is in stored procedure. The stored procedure will normalize and eliminate rows and columns iteratively in the table in MySQL. So it obtains 0 costs in each row and column. Then, the workers and jobs are matched until get the perfect matching.
# TABLE OF CONTENTS

Cover ......................................................................................................................... i
APPROVAL AND RATIFICATION PAGE ................................................................. ii
STATEMENT OF ORIGINALITY ........................................................................ iii
ABSTRACT ............................................................................................................... iv
PREFACE ................................................................................................................ v
TABLE OF CONTENTS ........................................................................................ vi
ILLUSTRATION INDEX ....................................................................................... vii
INDEX OF TABLES ............................................................................................... viii
CHAPTER 1 INTRODUCTION .................................................................................. 1
  1.1 Background .................................................................................................. 1
  1.2 Scope .......................................................................................................... 2
  1.3 Objective ..................................................................................................... 2
CHAPTER 2 LITERATURE STUDY ......................................................................... 3
CHAPTER 3 RESEARCH METHODOLOGY ......................................................... 5
CHAPTER 4 ANALYSIS AND DESIGN ............................................................... 7
  4.1 Analysis ...................................................................................................... 7
  4.2 Design ....................................................................................................... 11
CHAPTER 5 IMPLEMENTATION AND TESTING ............................................. 14
  5.1 Implementation ......................................................................................... 14
  5.2 Testing ...................................................................................................... 38
CHAPTER 6 CONCLUSION .................................................................................. 42
REFERENCES ....................................................................................................... 
APPENDIX ........................................................................................................... A
ILLUSTRATION INDEX

Illustration 5.1: Input Number of data.................................................................14
Illustration 5.2: First Input Sample.................................................................38
Illustration 5.3: First Data Sample.................................................................39
Illustration 5.4: First Output Sample...............................................................39
Illustration 5.5: Second Input Sample..............................................................39
Illustration 5.6: Second Data Sample...............................................................40
Illustration 5.7: Second Output Sample...........................................................40
Illustration 5.8: Third Input Sample.................................................................40
Illustration 5.9: Third Sample Data.................................................................41
Illustration 5.10: Third Output Sample............................................................41
INDEX OF TABLES

Table 4.1: Example Source Data.............................................................................. 7
Table 4.2: Process 1.................................................................................................. 8
Table 4.3: Result of Normalizing Row..................................................................... 8
Table 4.4: Result of Normalizing Column............................................................... 9
Table 4.5: Only Zero Cost........................................................................................ 9
Table 4.6: Covered Zero Cost................................................................................ 10
Table 4.7: Result of Substracted and Added by Smallest Cost.............................. 10
Table 4.8: Only Zero Cost...................................................................................... 10
Table 4.9: Sample of Table Process........................................................................ 11