TIMETABLE MANAGER

BASED ON MULTIDIMENSIONAL ARRAY SOLVING ALGORITHM

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DISSERTATION

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DECLARATION OF THE CANDIDATE

I hereby certify that this dissertation does not incorporate acknowledgement of any material previously submitted for a degree or diploma in any university, and to the best of my knowledge and belief it does not contain any material previously published or written by another person or myself except where due reference is made in the next text.

_____ _____

K.R.S. Koswatte Date

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DECLARATION OF THE SUPERVISOR

I hereby certify that I have supervised and accepted this as the dissertation for the partial fulfilment of the requirement for the master in science degree in operational research.

_____ _____

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DEDICATION

This dissertation is dedicated to you all, with love, who works, worked and will work for the wellbeing of all beings.

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ABSTRACT

Multi-index assignment problems were introduced as a natural extension of linear assignment problems. It seems that this would be a new branch of methods that could be used for solving Multi Index Assignment Problems.

In this study, a method is introduced to solve the multi index assignment problems, where the method is very similar to Hungarian method. The name “Multidimensional Array Solving Algorithm” (MASA) is used for the algorithm presented here. As the name implies the method could be used to solve problems related to multi-dimensional assignment problems. This method would be very useful when applying to practical computing problems. Even though the example is used for a three dimensional assignment problem, it could be extended to higher order assignment problems and applied to many situations with slight modifications. However, this part is not studied yet and may have lot of different variations.

MASA is also used to develop the algorithm of the software developed under the project. The database desktop application named as the timetable manager is developed with use of object oriented programming. The same application is applied to solve the example. Depending on the number of resources or objects in a dimension, the solving time would increase rapidly. However, due to line and matrix operations, the running time possibly could be reduced.

TABLE OF CONTENTS

Declaration of the Candidate ii

Declaration of the Supervisor iii

Dedication iv

Acknowledgement v

Abstract vi

Table of Contents vii

List of Tables ix

List of Figures xi

Abbreviations xii

1. Introduction 1

1.1 Problem Definition and Background 1

1.2 Objectives 2

1.3 Scope of Project 2

1.4 Significance of Project 3

1.5 Content of Dissertation 3

2. Literature Review 5

2.1 Linear Assignment Problems 5

2.2 Quadratic Assignment Problems 6

2.3 Multi-index Assignment Problems 6

2.4 Exact & Experimental Solution Methods 7

2.5 Software Implementation of LAP and MAP Optimization 7

3. Methodology 9

3.1 Linear Assignment Problems (LAP) 9

3.2 Problem Definition for LAP 9

3.3 Algorithms for LAP 9

3.4 Hungarian Method for LAP 10

3.5 Multi- index Array Solving Algorithm (MASA) for Multi-index assignment problems 10
3.6 Problem Definition for MAP 11
3.7 Three Dimensional Assignment Problems 12
3.8 Multi-index Array Solving Algorithm (MASA) 13
3.9 Time table manager Software Architecture 15
4. Analysis 17
4.1 Example of Solving 3-PAP with MASA 17
4.2 Solving with Excel Solver using Simplex Method 47
4.3 Example by Simulating the Application 51
5. Conclusion 66
5.1 Comparison of MASA with Other Methods for Solving MAPs 66
5.2 Limitations of MASA 68
5.3 Future Developments & Recommendations 69
Bibliography 71
Appendix A- Important Coding in The Timetable Manager 73
Appendix B-Software implementations for the Hungarian algorithm 124

LIST OF TABLES

Table 4-1: Step 1- Example MAP Represented on a Table 19
Table 4-2: Step 2 20
Table 4-3: Output of Step 2 21
Table 4-4: Step 3 22
Table 4-5: Operations planes of Step 3 23
Table 4-6: Step 4 24
Table 4-7: Output of Step 4 25
Table 4-8: Step 5 26
Table 4-9: Operations Planes of Step 5 27
Table 4-10: Step 6 28
Table 4-11: Output of Step 6 29
Table 4-12: Step 7 30
Table 4-13: Operations Planes of Step 7 31
Table 4-14: Step 8 32
Table 4-15: Output of Step 8 33
Table 4-16: Step 9 34
Table 4-17: Operations Planes of Step 9 35
Table 4-18: Step 10 36
Table 4-19: Output of Step 10 37
Table 4-20: Step 11 38
Table 4-21: Operations Planes of Step 11 39
Table 4-22: Step 12 40
Table 4-23: Output of Step 12 41
Table 4-24: Step 13 42
Table 4-25: Operations Planes of Step 13 43
Table 4-26: Step 14 44
Table 4-27: Operations Planes of Step 14 45
Table 4-28: Answer for the MAP 46
Table 4-29: Answer for the MAP 47
Table 4-30: Output tables of the Excel Solver 48
Table 4-31: Excel Solver Report 48
Table 4-32: Excel Solver Report 49

Table 4-33: Excel Solver Report.....50
Table 4-34: Answer for the Example MAP 65

LIST OF FIGURES

Figure 3-1: Flow Chart of the Hungarian Method 11
Figure 3-2: Flow Chart of MASA 14
Figure 3-3: Basic Database Architecture 15
Figure 4-1: Flow Chart of Steps of the Example 18
Figure 4-2: Add Period Interface 1 51
Figure 4-3: Add Period Interface 2 52
Figure 4-4: Add Period Interface 3 52
Figure 4-5: Add Student Group Interface 53
Figure 4-6: Query Student Group Interface 1 54
Figure 4-7: Query Student Group Interface 2 54
Figure 4-8: Add Subject Interface 55
Figure 4-9: Add Teacher Interface 56
Figure 4-10: Query Teacher Interface 1 56
Figure 4-11: Query Teacher Interface 2 57
Figure 4-12: Score View& Edit Interface 58
Figure 4-13: Query Score Interface 59
Figure 4-14: Auto Assign Command Interface 59
Figure 4-15: Query Student Group Time table Interface 1 60
Figure 4-16: Query Student Group Time table Interface 2 61
Figure 4-17: Query Student Group Time table Interface 3 61
Figure 4-18: Query Student Group Time table Interface 4 62
Figure 4-19: Query Teacher Timetable Interface 1 62
Figure 4-20: Query Teacher Timetable Interface 2 63
Figure 4-21: Query Teacher Timetable Interface 3 63
Figure 4-22: Query Teacher Timetable Interface 4 64
Figure 5-1: Advanced MASA for higher order MAPs 67

ABBREVIATIONS

3-D - 3 Dimensional

3-DAP - Three Dimensional Assignment Problems

3-PAP - Planner 3 Dimensional Assignment Problems

LAP - Linear Assignment Problem

LBAP - Linear Bottleneck Assignment Problems

LSAP - Linear Sum Assignment Problem

MAP - Multi-Index Assignment Problem/Multi-Dimensional Assignment Problems

MASA – Multi-index Array Solving Algorithm

NP - Non-deterministic Polynomial-time hard

OP - Operations Plane

QAP - Quadratic Assignment Problem