IMPROVING CLASS TIMETABLING USING GENETIC ALGORITHM

A Thesis submitted to the Graduate School in partial fulfilment of the requirements for the degree Master of Science (Intelligent System), Universiti Utara Malaysia

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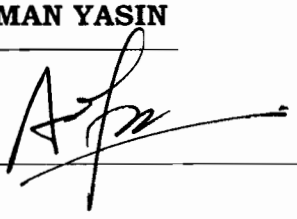
(Signature) : 

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ABSTRACT

Timetables are used to schedule classes and teachers in school. It involved assigning times and places to appropriate events by making use of available resource. Badly designed timetables are not just inconvenient but proved expensive in terms of wasting time and money. Hence, the major aim of this research is to investigate the internal mechanism of genetic algorithm in solving and improving class timetabling problem. We have targeted the research on class timetabling problem. Hence, Genetic Algorithm (GA) is used as one of the most popular optimization solutions. It has been implemented in various applications such as scheduling. The flows of GA are using selection, crossover and mutation operators applied to populations of chromosomes. This paper reports the powerful techniques using GA in scheduling. Class timetabling problem is one of the applications in scheduling. In one aspect, it deals with subjects such that it fulfils the process time slot. These aspects are important for the class timetabling so it can be done in a smooth way and no lecture can sit more than one classroom in a same time slot. The other constraint is the lecture workload should be arranged less than two classes in one day. The class timetabling problem at Sekolah Menengah Kebangsaan Bandar Baru Sintok is introduced and the prototype has been developed using Java language. The prototype suggested several feasible solutions to the user.

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Dedicated to,,,,,,,

My Loving Parents

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LIST OF ABBREVIATIONS

ACS	Ant Colony System
BSc. IT	Bachelor of Science Information Technology
CBR	Case Base Reasoning
CTS	Class Timetabling System
FIFO	First In First Out
GA	Genetic Algorithm
GDA	Great Deluge Algorithm
GUI	graphic user interface
HC	Hill Climbing
IS	Information System
JSDK 1.5.0_08	Java Software Development Kit version 1.5.1_08
MA	Memetic Algorithm
NP	Nondeterministic Polynomial
PMRP	Point to Multipoint Routing Problem
TEDI	Timetabling Tool for Educational Institutions
UPJJ	Unit Pendidikan Jarak Jauh
UUM	Universiti Utara Malaysia

CHAPTER 1

INTRODUCTION

The aim of this paper is to discuss on the project background that mainly involves in class timetabling using Genetic Algorithm (GA). The problem statement, the objective and the significance of the study and scope will be discussed in this section.

1.1 Problem Statement

Nowadays, Schools are using timetables to schedule teachers and classes to fully utilize available resources. This is done by assigning correct times and places to appropriate events. Hence, the timetables must be designed to satisfy all user requirements, or else it would be a waste of time and resources.

Prior to the existence of the general algorithms such as evolutionary algorithm (EA), timetable builders tend to plan school timetable manually or using computer

The contents of the thesis is for internal user only

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