MINING STUDENT'S PERFORMANCE IN SPM USING STATISTICS AND NEURAL NETWORKS FOR TECHNICAL SUBJECT

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ABSTRAK (BAHASA MELEYU)

Pencapaian pelajar di dalam peperiksaan menjadi penanda aras yang penting dalam menentukan kualiti pendidikan di Malaysia. Data-data peperiksaan telah dikumpul mulai ujian-ujian bulanan yang telah dijalankan sehingga ke percubaan SPM untuk diuji dengan peperiksaan SPM yang sebenar. Ini juga melibatkan data-data lain yang berkaitan seperti latar belakang keluarga dan maklumat berkenaan persekolahan pelajar. Data mentah diproses serta dianalisa menggunakan kaedah Statistik. Kaedah Statistik memberikan analisis yang bernilai kepada model pencapaian. Kemudian, kombinasi unit input, unit tersembunyi dan unit output diuji untuk meramal pencapaian sebenar pelajar. 7 model diuji berdasarkan 7 matapelajaran teras untuk mengaitkannya dengan faktor-faktor lain menggunakan analisis diskriptif. Justeru, hubungan itu dikaji dengan teliti untuk mengukuhkan model jangkaan. Keputusan yang telah diperolehi menunjukkan Rangkaian Neural mempunyai potensi yang tinggi untuk meramal pencapaian pelajar di masa hadapan.

ABSTRACT (ENGLISH)

Academic performance has become an important evidence of determining the quality in Malaysia's education system. The examination data is collected on the previous students' examinations yet to be tested for their coming SPM. The other related data such as family background and schooling information are also involved. The raw data is preprocessed and analyzed using statistical method. The results from the statistical analysis indicate the significant contribution of these attributes to the achievement model. The combinations of input variables, hidden layer and output nodes are explored to predict the students' performance. Seven models are constructed based on seven subjects to relate them with other factors for the purpose of descriptive analysis. The relationship between examination results and other factors are investigated thoroughly to enhance the prediction model. The result indicates that Neural Networks has high potential to be used in predicting students' performance.

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DEDICATION

To my parents Abdul Latiff and Jainamboo, my wife Zubaidah, and to my children

Basyirah, Muhammad Arif and Muhammad Amran.

CHAPTER 2: LITERATURE REVIEW

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LIST OF ABBREVIATIONS

AI	Artificial Intelligence
ANN	Artificial Neural Networks
BP	Backpropagation Algorithm
FF	Feed Forward Algorithm
MLP	Multilayer Perceptrons
NC	Neural Connection
NN	Neural Networks
SPM	Sijil Pelajaran Malaysia
BM	Bahasa Melayu
BI	Bahasa Inggeris
MAT	Mathematics
SCI	Science
SEJ	Sejarah
PI	Pendidikan Islam
PENDO	Pendawaian Domestik
SMK	Sekolah Menengah Kebangsaan
SMM	Sistem Maklumat Murid
BMM	Borang Maklumat Murid
HMM	Hamparan Markah Murid

CHAPTER 1

INTRODUCTION

This section discusses the background of the study that consists of general overview on data mining techniques, which have been used in this study. A brief description on selected domain, education domain is also reviewed. The section also consists of the problem statement, list of project objectives, significance of the study conducted and the study scope. Finally, this section presents the thesis organization that describing the structure of this report.

1.1 Background

The word mining has been used to describe the activity of digging coal or other essential substances out of the ground. The Cambridge Advanced Learner's Dictionary defines the word mining in several ways. As an information technology jargon, mining commonly implies data mining, and is defined as applying a specific algorithm for the discovery of hidden knowledge, unexpected patterns and new rules in large databases, (Dunham, 2003). Fayyad et al. (1996) defined data mining as "the use of algorithms to

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