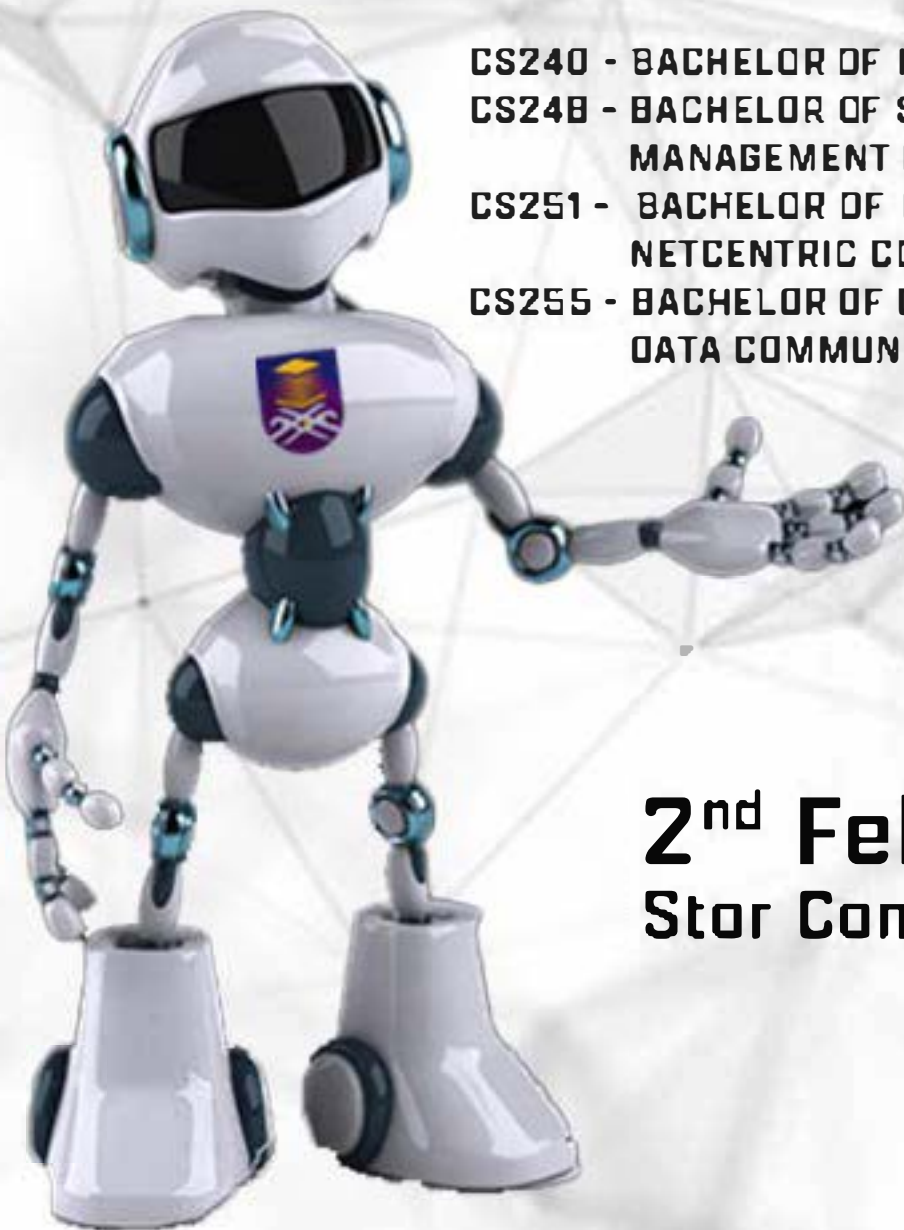

RESEARCH EXHIBITION IN MATHEMATICS & COMPUTER SCIENCES

REMACS 5.0



CS240 - BACHELOR OF INFORMATION TECHNOLOGY [HONS.]
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2nd February 2023
Stor Complex, UiTM Perlis

Organized by:
College of Computing, Informatics and Media
Universiti Teknologi MARA Perlis Branch

**Research Exhibition in Mathematics and Computer Sciences
(REMACS 5.0)**

Research Exhibition in Mathematics and Computer Sciences (REMACS 5.0)

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Preface

It is with great pleasure that we present this extended abstract book, titled "The 5th Research Exhibition in Mathematics and Computer Sciences (REMACS 5.0)". This book is a collection of research work in the fields of Computer Science and Mathematics, contributed by the final year students from Universiti Teknologi MARA, Perlis Branch. The aim of this book is to showcase the diversity and depth of research in these two interrelated fields.

Mathematics and Computer Science are two fields that have seen tremendous growth and advancement in recent years. With the rise of new technologies and the increasing demand for data-driven solutions, researchers in these fields have been working hard to develop new theories, algorithms, and models that can help solve some of the most pressing problems of our time. This book is a testament to their hard work and dedication.

The abstracts in this book cover a wide range of topics, including algebra, analysis, logic, computer architecture, algorithms, artificial intelligence, machine learning, computer network, netcentric computing and many more. The work presented here is both theoretical and practical, and has the potential to impact many areas of society, from finance and healthcare to education and security.

We hope that this book will serve as a valuable resource for future students in the fields of Mathematics and Computer Science. We also hope that it will inspire more students to pursue innovative and groundbreaking research in these two fields. Finally, we would like to express our gratitude to all the contributors for their hard work and dedication, without which this book would not have been possible.



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EVENT SCHEDULE

8:00 – 8:30 am

- Registration

8:00 am – 12:00 pm

- FYP Project Presentation

12:00 - 2:00pm

- Lunch Break

2:15 – 2:35 pm

- National & Wawasan Setia Anthems
- Doa Recitation

2:35 – 2:45 pm

- Welcoming Address by Director of REMACS 5.0

2:45 – 2:55 pm

- Officiating & Closing Remarks from Rector of UiTM Perlis

2:55 – 3:00 pm

- REMACS 5.0 Montage

3:00 – 4:00 pm

- Awarding of Winners:
 - Best Poster
 - Best Project Award

- Photo Session

- End of Ceremony

Dress Code: Formal / Corporate

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EXTENDED ABSTRACTS

RESEARCH EXHIBITION IN MATHEMATICS & COMPUTER SCIENCES
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A FUZZY PROMETHEE APPROACH FOR CHOOSING THE MOST PREFERABLE HEALTH INSURANCE COMPANIES

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Abstract

An insurance is a firm or agency that will guarantee coverage for a specified loss, damage, illness, or death in exchange for the payment of a specific premium. A person pays for protection from any unforeseen financial losses when they get insurance. The insurance company would pay them if something unfortunate happens to them. Selecting an insurance company is challenging because it necessitates careful consideration and study to make the best choice. The decision-making process is harder by each person's individual perception. Different people have different tastes when it comes to insurance companies. Because of this, it is crucial to follow the right procedure while choosing the best insurance company. The objectives of this study are to rank insurance companies by using fuzzy PROMETHEE and to evaluate the performance of the insurance companies by the comparison of fuzzy PROMETHEE ranking and the original ranking. Three insurance companies which are Great Eastern, AIA, and PRUDENTIAL will be ranked in this study. The contribution, coverage, deductible, and waiting period are the criteria that will be considered in this study. The insurance companies will be ranked by using the fuzzy PROMETHEE. A decision maker is required to rate the alternatives and criteria in this study. As a result, the most preferable health company is Great Eastern as the first, AIA as the second and PRUDENTIAL as the last. The findings of this study will be beneficial for many people. Future researchers are recommended to widen the scope of the project by considering varieties of alternatives and criteria.

Keywords: insurance companies, fuzzy PROMETHEE, ranking

1. Introduction

This research is studied to rank the insurance companies namely Great Eastern, AIA and PRUDENTIAL using fuzzy PROMETHEE. It is also to evaluate the performance of the insurance companies by the comparison of original ranking and fuzzy PROMETHEE ranking. Seven criteria are considered in this study namely contribution, coverage, deductible and waiting period using fuzzy PROMETHEE method. The criteria and alternatives are rated by a decision maker using linguistic variables in this study.

2. Methodology

Data were collected by interviewing a decision maker who is an employee who just started working and still in confusion to choose an affordable insurance company. The information about each of the insurance companies was explained briefly to the decision maker. The companies were ranked by the decision maker based on the information given. Next, the quotations of the decision maker based on his details from each company were then explained in specifics. The insurance companies were rated based on each criterion by the decision maker. The ratings were then evaluated using fuzzy PROMETHEE method to find the ranking of the insurance companies. By the ranking, the performance of each insurance companies was analysed.

3. Results and Discussion

For this research, Great Eastern, AIA and PRUDENTIAL were considered as the alternatives and contribution, coverage, deductible and waiting period of each company as the criteria. The ratings from the decision maker were calculated using the steps in fuzzy PROMETHEE. The alternatives were

ranked by their net flows where net flow is the subtraction of the fuzzy leaving flow and fuzzy entering flow. By the calculation of fuzzy PROMETHEE, Great Eastern was the first rank, AIA was the second and PRUDENTIAL was the third with the net flow of 0.2542, -0.0877 and -0.1666 respectively. To choose the best alternative, the highest net flow was the right choose. We can conclude that Great Eastern with the lowest net flow is the most preferable insurance company.

4. Novelty of Research / Product

There have been a few of studies about the investigation of various applications using fuzzy PROMETHEE. Previous research about ranking the most popular cancer treatment methods such as chemotherapy, radiotherapy, hadron therapy, immunotherapy, hormone therapy, and surgery were studied based on some criteria. (Ozsahin, 2019). A previous researcher used fuzzy PROMETHEE and the standard criterion preference functions to evaluate a green supplier preference using four alternatives, five decision makers and seven criteria. (Abdullah, 2019). In the study of previous research, fuzzy PROMETHEE was used to examine the efficacy of several natural wastewater treatment strategies, including stabilisation ponds (SP), built wastelands, aquatic plant use (AP), soil filters (SF), and wastewater reuse for irrigation (RWI). (Gichamo, 2020). A study was conducted for landslide susceptibility mapping (LSM) production using FAHP and PROMETHEE II on eight landslide-related raster-based layers. (Roodposhti, 2014). In a government-high priority industry, such as information and communications technology, a researcher proposed a research to analyse and choose early-stage yet high potential start-up companies. (Afful-Dadzie, 2015). These are all the researches that have been studied by the previous researchers. However, there has not been any research on ranking insurance companies namely Great Eastern, AIA and PRUDENTIAL in Malaysia. Therefore, the goal of this research is to provide the ranking of insurance companies using scientific method that can be proved and trusted which is fuzzy PROMETHEE.

5. Conclusion

Fuzzy PROMETHEE can successfully rank the health insurance companies. Similarities and differences can also be determined by the evaluation of the insurance companies' performance by the comparison of fuzzy PROMETHEE ranking and the original ranking. Future researchers are recommended to widen the scope of the project by considering varieties of alternatives and criteria.

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