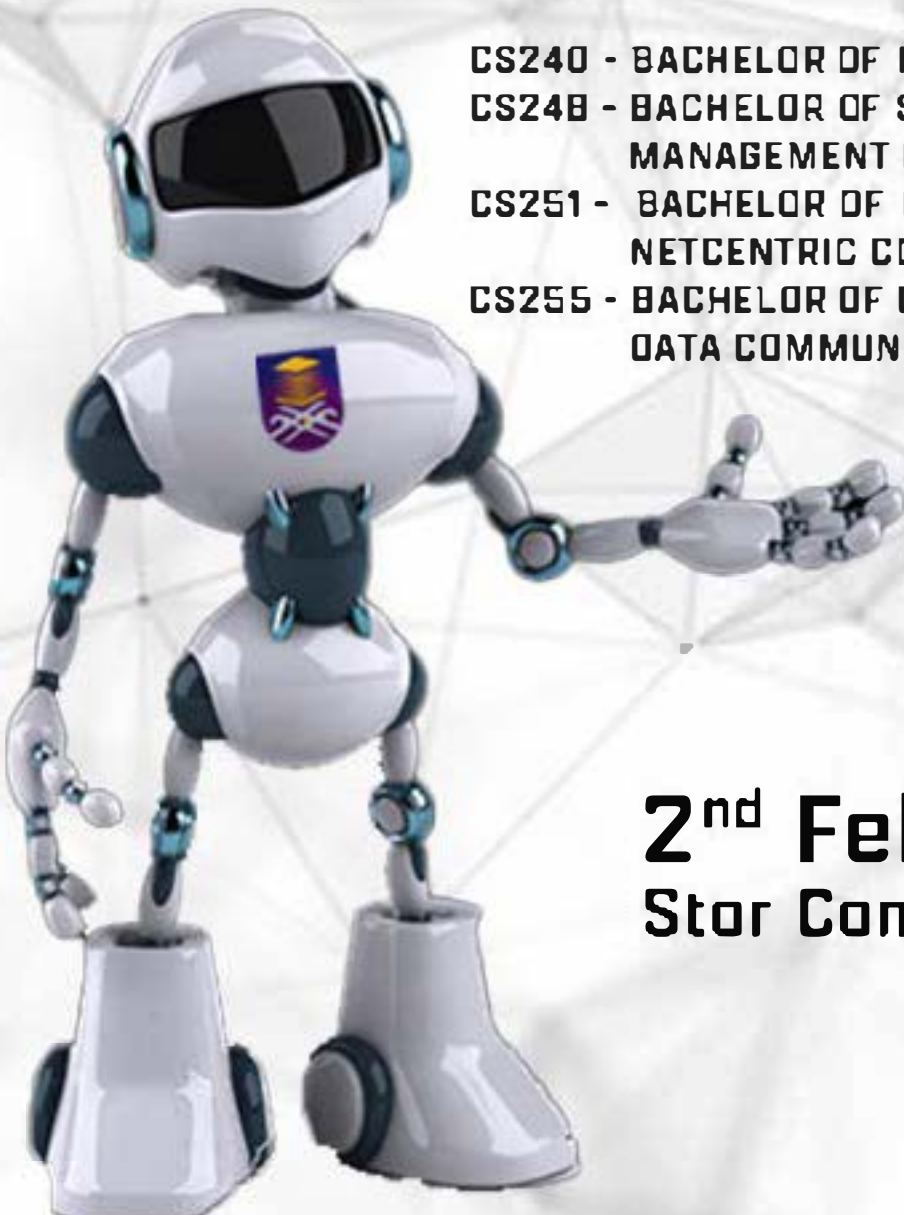


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RESEARCH EXHIBITION IN MATHEMATICS & COMPUTER SCIENCES

# REMACS 5.0

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- CS240 - BACHELOR OF INFORMATION TECHNOLOGY [HONS.]
  - CS248 - BACHELOR OF SCIENCES [HONS.]  
MANAGEMENT IN MATHEMATICS
  - CS251 - BACHELOR OF COMPUTER SCIENCE [HONS]  
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DATA COMMUNICATION & NETWORKING

**2<sup>nd</sup> February 2023**  
**Stor Complex, UiTM Perlis**

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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 5<sup>th</sup> 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

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RESEARCH EXHIBITION IN MATHEMATICS & COMPUTER SCIENCES  
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# RANKING FIVE MODELS OF LAPTOPS USING FUZZY PROMETHEE

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## **Abstract**

In modern college classrooms, computers are a common sight. Laptops are apparently brought by students as a learning aid since they make e-books easily accessible, can replace handwritten notes, enable rapid online access to material relating to the day's lecture, and allow for quick computations for arithmetic or statistics issues. It is crucial to research students' needs in this study. Four key features—price, battery, storage, and weight—were identified by several students after observation and comments. That's why, it is prior to looking at other characteristics, this is a crucial quality to consider while choosing the finest laptop model. This research has considered five brands of laptops from five different companies. This research has three goals in mind. Foremost, to determine the most important criterion for buying a laptop. In addition, the study aims to rank laptop brands using the fuzzy Preference Ranking Organization Method for Enrichment Evaluation (PROMETHEE) and its final objective is to compare the fuzzy PROMETHEE ranking with the original ranking. Twenty respondents are required to evaluate this issue using linguistic variables ranging from “very poor” to “very good”. The components are ordered using Fuzzy PROMETHEE. The findings of this study might be beneficial to many students. Future research might broaden the scope of the project by including a variety of criteria and objectives.

*Keywords: Ranking, Fuzzy PROMETHEE, Laptops*

## **1. Introduction**

The objectives of this research are to determine the most important criterion for buying a laptop, to rank laptop brand by using fuzzy PROMETHEE and to compare the fuzzy PROMETHEE ranking with the original ranking. This study will focus on ranking five models of laptops from five different brands and companies which are Acer Aspire 5, Asus Vivo book S15, Lenovo Legion Y740, HP Omen 17, and Dell G5 15. The criteria that will be considered in ranking the laptops are price, storage, weight, and battery. The laptops will be ranked using fuzzy PROMETHEE.

## **2. Methodology**

Data were collected from student UiTM Perlis Branch who is the user of one brand of laptop from five type of brand that be ranked. Data for this study will be collected by asking the decision makers to assess the importance of the alternatives criteria and rate the performance of alternatives based on criteria using linguistic variables. The linguistic variables will then be converted into their corresponding fuzzy numbers. By doing this, the fuzzy weight of criteria and fuzzy performance of the alternative will be obtained.

## **3. Results and Discussion**

The alternative for this research is Acer Aspire 5, Asus Vivo book S15, Lenovo Legion Y740, HP Omen 17 and Dell G5 15. Meanwhile, for the criteria are price, storage, weight, and battery. The ranking has been decided by their net flow value. The highest Net Flow value is ranked by the highest rank. Meanwhile, the lowest Net Flow value was ranked by the lowest rank. Fuzzy PROMETHEE method resulting, Acer Aspire 5 is rank by first place with highest Net Flow value 0.367339, second is Asus Vivo book S15 with 0.042305 net flow value, third placing by Lenovo Legion Y740 with 0.000297, fourth place rank by HP Omen 17 with net flow value -0.07212 and Dell G5 15 is ranked by place 5 with Net Flow value -0.33782.

#### 4. Novelty of Research / Product

There is collection of research that using PROMETHEE method in solving problems. For example, Abdullah et al.; (2019), using the PROMETHEE and the conventional criterion preference functions, suggested a preference for green providers. Afful-Dadzie et al. (2015) used the (fuzzy PROMETHEE) method to analyze and choose early-stage but high-potential start-up enterprises in a government high-priority field like information and communications technology. Academics and practitioners have been interested in the PROMETHEE family of outranking algorithms and their applications since Behzadian et al. (2010). This study established the ideas for a new family of outranking systems (Brans & Vincke, 1985). D. U. Ozsahin et al. (2017), aims to analyze and compare the most prevalent nuclear medicine imaging devices using a multi-criteria decision-making technique choice, with fuzzy PROMETHEE as the theory of interest. (Li and Li, (2010). (PROMETHEE) techniques were applied to a manufacturing organization by Tuzkaya et al. (2010) to demonstrate their usefulness. However, there hasn't been any research on ranking the brands of the five distinct laptop manufacturers that Malaysia has imported from: Acer, Asus, Lenovo, HP, and Dell. Therefore, the purpose of this study is to present a rating of five selected laptop brands utilising a verifiable scientific PROMETHEE approach.

#### 5. Conclusion

Fuzzy PROMETHEE can handle the subjectivity and ambiguity of human thoughts. When making choices, people can become confused. Humans have always made decisions based on a single criterion, even though multiple criteria should be considered.

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