

Universiti Teknologi MARA

**Personalized Grocery Basket Recommendation Using
Content-Based Filtering Algorithm**

Fatin Nadhirah Binti Azlan

**Thesis submitted in fulfilment of the requirements for Bachelor of
Computer Science (Hons.)
Faculty of Computer and Mathematical Sciences**

February 2021

ACKNOWLEDGEMENT

Alhamdulillah, praises and thanks to Allah because of His Almighty and His utmost blessings, I was able to finish this research within the time duration given. Firstly, my special thanks goes to my supervisor, Norizan Binti Mohamad, for her guidance, advice and support in order to complete this project. I truly appreciate everything she has taught me.

Thank you too to my subject lecturer, Norlina Binti Mohd Sabri for her guidance and detailed instructions on how to complete this project as well as encouraging me to stay motivated during the development of this project.

Special appreciation goes to my parents, Azland Bin Abdul Aziz and Rohana Binti Ahmad for making sure I am always in my best condition throughout making this project from the start till the end.

Lastly, I would like to give my gratitude to all my friends in class CS2306C for making me stay motivated throughout making this project, whether directly or indirectly. They also provide ideas that helped me in completing this project.

Thank you so much.

ABSTRACT

With the emergence of e-commerce, recommendation system has become a demand to recommend the right items to the right users. Recommendation system is a part of data mining, which is a process of obtaining useful information from a large amount of data. There are two problems that initiates the development of this project. One is the users having difficulty to identify which website that gives the best recommendation for the item they want, and the other problem is time consuming for customers to find the right items. For this project, literature study is done to understand the best approach to solve problems, then the system is developed using Python language with interfaces, and lastly evaluation is done to test the accuracy. The output that are shown to users are the item being recommended with its price and the website being collected. This project achieved all the objectives but has several limitations such as not optimal evaluation method, lack of user interface and the strict user input.

TABLE OF CONTENTS

CONTENT	PAGE
SUPERVISOR APPROVAL	ii
STUDENT DECLARATION	iii
ACKNOWLEDGMENT	iv
ABSTRACT	v
TABLE OF CONTENTS	vi
LIST OF FIGURES	ix
LIST OF TABLES	xi
CHAPTER 1: INTRODUCTION	
1.1 Background of the Study	1
1.2 Problem Statements	2
1.3 Objectives	3
1.4 Research Scopes	3
1.5 Project Significances	4
1.6 Overview of Research Framework	5
1.7 Summary	5
CHAPTER 2: LITERATURE REVIEW	
2.1 Recommendation System	6
2.1.1 The Use of Recommendation System	6
2.1.2 Phases of Recommendation Process	7
2.1.3 Recommendation System Algorithm	11
2.2 E-Commerce Recommendation System	12
2.2.1 Existing Problem with E-Commerce Recommendation System	12

2.2.2	Benefits of Using Recommendation System in E-Commerce	13
2.3	Content-Based Filtering Algorithm	14
2.3.1	Architecture	14
2.3.2	Implementation of Content-Based Filtering Algorithm in Various Problems	16
2.4	Similar Works	17
2.5	Implication of Literature Review	19
2.6	Conclusion	20

CHAPTER 3: RESEARCH METHODOLOGY

3.1	Overview of Research Methodology Framework	21
3.1.1	Details of Research Methodology Framework	21
3.2	Preliminary Study	22
3.2.1	Literature Study	23
3.3	Data Analysis	23
3.3.1	Data collection	24
3.3.2	Data Cleaning	25
3.4	Design	26
3.4.1	Design Interface	27
3.4.2	Process in Building Personalized Grocery Basket Recommendation System	29
3.5	Implementation	29
3.5.1	Hardware and Software	30
3.6	Evaluation	30
3.6.1	5-Fold Cross Validation	31
3.7	Conclusion	32

CHAPTER 4 RESULT AND FINDING

4.1	Conceptual Framework	34
4.2	Program Codes for Algorithm	35