PASSWORD MANAGER WITH USERNAME RECOMMENDATION USING FISHER-YATES SHUFFLE ALGORITHM

By

UNDERGRADUATE THESIS
Submitted as one of the requirements to obtain
Sarjana Komputer (S.Kom.)

By
ALIVIANNISA AULIA SHABIRA
001202000122

FACULTY OF COMPUTING
INFORMATICS STUDY PROGRAM
CIKARANG
OCTOBER, 2023

PASSWORD MANAGER WITH USERNAME RECOMMENDATION USING FISHER-YATES SHUFFLE ALGORITHM

By

Aliviannisa Aulia
Shabira
001202000122

Approved:

Ronny Juwono, S. Pd, MT.	Cutifa Safitri, Ph.D.
Thesis Advisor	Program Head of Information Technology

Rila Mandala, Ph.D.
Dean of Faculty of Computing

STATEMENT OF ORIGINALITY

In my capacity as an active student at President University and as the author of the final project stated below:

Name : Aliviannisa Aulia Shabira

Student ID number : 001202000122

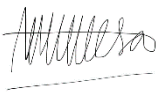
Study Program : Informatics

Faculty : Computer Science

I hereby declare that my final project entitled "**PASSWORD MANAGER WITH USERNAME RECOMMENDATION USING FISHER-YATES SHUFFLE ALGORITHM**" is to the best of my knowledge and belief, an original piece of work based on sound academic principles. If there is any plagiarism detected in this final project, I am willing to be personally responsible for the consequences of these acts of plagiarism and will accept the sanctions against these acts in accordance with the rules and policies of President University.

I also declare that this work, either in whole or in part, has not been submitted to another university to obtain a degree.

Cikarang, 2023



Aliviannisa Aulia Shabira

SCIENTIFIC PUBLICATION APPROVAL FOR ACADEMIC INTEREST

As an academic community member of the President's University, I, the undersigned:

Name : Aliviannisa Aulia Shabira

Student ID number : 001202000122

Study program : Informatics

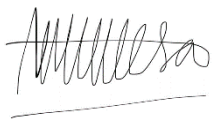
for the purpose of development of science and technology, certify, and approve to give President University a non-exclusive royalty-free right upon my final report with the title:

"PASSWORD MANAGER WITH USERNAME RECOMMENDATION USING FISHER-YATES SHUFFLE ALGORITHM"

With this non-exclusive royalty-free right, President University is entitled to converse, to convert, to manage in a database, to maintain, and to publish my final report. There are to be done with the obligation from President University to mention my name as the copyright owner of my final report.

This statement I made in truth.

Cikarang, 2023



Aliviannisa Aulia Shabira

ADVISOR APPROVAL FOR JOURNAL/INSTITUTION'S REPOSITORY

As an academic community member of the President's University, I, the undersigned:

Name : Rony Juwono

ID number : 201607622

Study program : Informatics

Faculty : Computing

declare that following thesis:

Title of thesis: **PASSWORD MANAGER WITH USERNAME RECOMMENDATION USING FISHER-YATES SHUFFLE ALGORITHM**

Thesis author : Aliviannisa Aulia Shabira

Student ID number : 001202000122

will be published in **journal / institution's repository / proceeding / unpublished.**

Cikarang, 2023

Ronny Juwono, S. Pd, M. T.

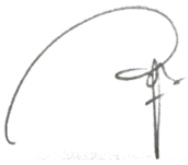
PANEL OF EXAMINER APPROVAL

The Panel of Examiners declare that the undergraduate thesis entitled **PASSWORD MANAGER WITH USERNAME RECOMMENDATION USING FISHER-YATES SHUFFLE ALGORITHM** that was submitted by **Aliviannisa Aulia Shabira** majoring in **Informatics** from the Faculty of Computer Science was assessed and approved to have passed the Oral Examination on Friday October 20, 2023.

Panel of Examiner

TJONG WAN SEN

Chair of Panel Examiner



ROSALINA

Examiner I

PLAGIARISM CHECK RESULT

Password Manager with Username Recommendation using Fisher-Yates Shuffle Algorithm

ORIGINALITY REPORT

10%	13%	0%	6%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

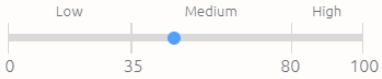
PRIMARY SOURCES

1	Submitted to President University Student Paper	3%
2	repository.president.ac.id Internet Source	2%
3	www.tutorialspoint.com Internet Source	2%
4	medium.com Internet Source	2%
5	github.com Internet Source	1%
6	Submitted to University Tun Hussein Onn Malaysia Student Paper	1%
7	Submitted to MCC Training Institute Student Paper	1%

These measurements have been normalized on a scale of 1–100 for display on this chart.

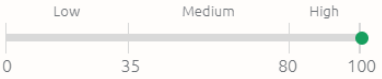
Readability: 46.8

Sentences with short words and low amount of syllables have high readability scores.



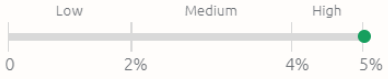
Perplexity: 150.5

How familiar a piece of text is to large language models like ChatGPT.



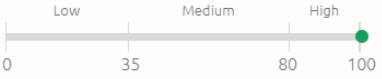
Percent SAT: 5.5%

Measures what percentage of words are SAT words, terms from a standardized college admissions exam known for its labyrinthine vocabulary lists.



Burstiness: 26503.9

Unique score developed by GPTZero in 2022 that correlates to variance in writing. Humans generally vary their writing patterns over time.

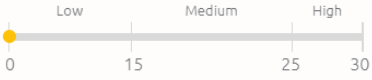


Simplicity: 25.6%

Measures what percentage of words are in the 100 most common words in the English language.

Average Sentence Length: 5.0 words

Unique score that correlates to variance in writing, where humans generally vary writing patterns.



ABSTRACT

This system saved the user's username and password so that they could easily remember their account on every page. Additionally, it contains a function that can recommend a username by using the fisher-yates shuffle algorithm. There is also a function on the website that allows users to sign in using face recognition. This function is powered by FaceApi.Js, which contains the MTCNN algorithm. Users will get the benefits from the existence of this system's development because it has made it easier for users to write down a note of their username and password on a more secure platform. This project was developed using the RAD methodology, which prioritizes finishing work in a relatively short amount of time. This methodology is very well suited for this project since the project being developed is not a very large project and is quite flexible due to the fact that there is a prototype stage. This enables developers to redesign the project at the same time without having to return to the initial stage again. The application of the integrated strategy led to the achievement of all planned features in the allotted amount of time and in the correct manner.

Keywords: *Password, Username, Recommendation, Face-Recognition, Fisher-Yates Shuffle Algorithm, MTCNN Algorithm, Rapid Application Development.*

DEDICATION

I would like to dedicate my final project to my Almighty God, my beloved family, my friends, my advisor, and all of my lecturers.

ACKNOWLEDGEMENT

First of all, I want to say Alhamdullilah Rabbil'alamin, all praise and thanks are for Allah, the lord of all creations. Thanks to his guidance and blessing, I was given the convenience to go through all the ups and downs while working on this final project. This final project report that I have produced was the last thing that was required of me in order to graduate with a Bachelor of Science degree. During the process of creating this final project, I was given a lot of help and encouragement from a variety of people. For this reason, I would like to extend my thanks to the following people:

1. Mr. Ivan Syahridwan and Mrs. Mita Kusumawaty, as my lovely parents who always support me in all fields, particularly in the field of education. Thank you for all your prayers, motivation, and everything you gave to me. I'm so grateful to be your daughter, and I never regret it. You are the best parents I have.
2. Muhammad Hafidz Ramadhan, as my one and only little brother who always be my everything partner. Thank you for becoming a place for me to talk and share every story.
3. Mr. Rony Juwono, as my thesis advisor who gave me guidance, knowledge, support, advice, and motivation during the preparation of my final project.
4. To all my lecturers in the Information Technology Major who taught me knowledge that I didn't know before.
5. Amelia Zhafira Azzahra and Ajeng Kacita Agrien, as my human diary who always accompanying me since 2016 until now, and if it's possible, forever till Jannah. Thank you for always being here beside me through all the ups and downs, with all the laughter and tears, and gave me emotional and physical support during the preparation of my final project.
6. Adya, Syifa, Hasbiya, Virgy, and Tasla, who always made my life full of rainbows and butterflies, gave me happiness and cheer me up whenever I'm on my lowest. Thank you for supporting me to complete my final project.
7. To all my college friends who always accompanied me to study from the first semester to the final semester. Thank you for encouraged and motivated me during college. I cannot stand here without all of your supports.
8. To 5 Seconds of Summer, Calum, Ashton, Luke and Michael, who produced songs that has always accompanied me since 2014 and also encouraged me in working on

my final project. Thank you for boosting up my moods with all the magical 5 albums.

9. Last but not least, I want to thank me. I want to thank me for believing in me. I want to thank me for all doing this hard work. I want to thank me for having no days off. I want to thank me for never quitting. I want to thank me for just being me at all times.

Even though this final project is far from perfect, hopefully it will be useful for students and all the readers.

TABLE OF CONTENTS

ABSTRACT 9

DEDICATION 10

ACKNOWLEDGEMENT 11

TABLE OF CONTENTS 13

LIST OF TABLES 16

LIST OF FIGURES 17

CHAPTER I INTRODUCTION ..... **Error! Bookmark not defined.**

1.1 Background ..... **Error! Bookmark not defined.**

1.2 Problem Statement ..... **Error! Bookmark not defined.**

1.3 Objectives ..... **Error! Bookmark not defined.**

1.4 Scope and Limitations ..... **Error! Bookmark not defined.**

1.4.1 Scope ..... **Error! Bookmark not defined.**

1.4.2 Limitations ..... **Error! Bookmark not defined.**

1.5 Project Methodology ..... **Error! Bookmark not defined.**

1.6 Final Project Outline ..... **Error! Bookmark not defined.**

CHAPTER II LITERATURE REVIEW ..... **Error! Bookmark not defined.**

2.1 Password ..... **Error! Bookmark not defined.**

2.2 Password Manager ..... **Error! Bookmark not defined.**

2.3 Fisher-Yates Shuffle Algorithm ..... **Error! Bookmark not defined.**

2.4 Face Recognition ..... **Error! Bookmark not defined.**

2.4.1 Face-API ..... **Error! Bookmark not defined.**

2.4.2 MTCNN ..... **Error! Bookmark not defined.**

2.5 Related Work ..... **Error! Bookmark not defined.**

CHAPTER III SYSTEM ANALYSIS ..... **Error! Bookmark not defined.**

3.1 System Overview ..... **Error! Bookmark not defined.**

3.2 Function Analysis..... **Error! Bookmark not defined.**

3.3 Use Case Diagram..... **Error! Bookmark not defined.**

3.4 Use Case Narrative..... **Error! Bookmark not defined.**

3.5 Swimlane Diagram..... **Error! Bookmark not defined.**

3.5.1 Swimlane Diagram of Create Account **Error! Bookmark not defined.**

3.5.2 Swimlane Diagram of Getting Password Recommendations **Error! Bookmark not defined.**

3.5.3 Swimlane Diagram of Accessing the Sign-in Page **Error! Bookmark not defined.**

3.5.4 Swimlane Diagram for Sign-In with Username and Password **Error! Bookmark not defined.**

3.5.5 Swimlane Diagram for Sign-in using Face Recognition..... **Error! Bookmark not defined.**

3.5.6 Swimlane Diagram to do Account Recovery **Error! Bookmark not defined.**

3.5.7 Swimlane Diagram to Access Dashboard ... **Error! Bookmark not defined.**

3.5.8 Swimlane Diagram for Saving Password **Error! Bookmark not defined.**

3.5.9 Swimlane Diagram Username and Password Recommendation **Error! Bookmark not defined.**

3.5.10 Swimlane Diagram to See the Details of the Other Website **Error! Bookmark not defined.**

3.5.11 Swimlane Diagram to Edit the Account Details **Error! Bookmark not defined.**

3.6 Hardware and Software Requirement **Error! Bookmark not defined.**

3.6.1 Hardware Requirement ..... **Error! Bookmark not defined.**

3.6.2 Software Requirement..... **Error! Bookmark not defined.**

CHAPTER IV SYSTEM DESIGN..... **Error! Bookmark not defined.**

4.1 User Interface Design ..... **Error! Bookmark not defined.**

4.1.1 Create Account Page ..... **Error! Bookmark not defined.**

4.1.2 Sign-In Page ..... **Error! Bookmark not defined.**

4.1.3 Account Recovery Page ..... **Error! Bookmark not defined.**

4.1.4 Dashboard Page ..... **Error! Bookmark not defined.**

4.1.5 Account Details Page ..... **Error! Bookmark not defined.**

4.2 Class Diagram ..... **Error! Bookmark not defined.**

CHAPTER V SYSTEM IMPLEMENTATION **Error! Bookmark not defined.**

5.1 Create Account Page ..... **Error! Bookmark not defined.**

5.1.1 Sign-Up Page Features ..... **Error! Bookmark not defined.**

5.2 Sign In Page ..... **Error! Bookmark not defined.**

5.2.1 Features of Sign-In Page ..... **Error! Bookmark not defined.**

5.2.2 Features of Face Recognition Page **Error! Bookmark not defined.**

5.3 Account Recovery Page ..... **Error! Bookmark not defined.**

5.3.1 Features of Account Recovery Page **Error! Bookmark not defined.**

5.4 Dashboard Page ..... **Error! Bookmark not defined.**

5.4.1 Features of Dashboard Page ..... **Error! Bookmark not defined.**

5.5 The Details of Other Website Account Page **Error! Bookmark not defined.**

5.5.1 Features of Details Page ..... **Error! Bookmark not defined.**

CHAPTER VI SYSTEM TESTING ..... **Error! Bookmark not defined.**

6.1 Testing Environment ..... **Error! Bookmark not defined.**

6.1.1 Create Account Page Testing Scenario **Error! Bookmark not defined.**

6.1.2 Sign-In Page Testing Scenario ..... **Error! Bookmark not defined.**

6.1.3 Account Recovery Page Testing Scenario .. **Error! Bookmark not defined.**

6.1.4 Dashboard Page Testing Scenario **Error! Bookmark not defined.**

6.2 Testing Summary ..... **Error! Bookmark not defined.**

CHAPTER VII CONCLUSION AND FUTURE WORKS**Error! Bookmark not defined.**

7.1 Conclusion..... **Error! Bookmark not defined.**

7.2 Future Works..... **Error! Bookmark not defined.**

REFERENCES ..... **Error! Bookmark not defined.**

LIST OF TABLES

Table 2.1 Comparation Table .....**Error! Bookmark not defined.**

Table 3.1 Table of Function Description ……...**Error! Bookmark not defined.**

Table 3.2 Use Case Narrative for “Create Account”**Error! Bookmark not defined.**

Table 3.3 Use Case Narrative for “Get Password Recommendation”.....**Error! Bookmark not defined.**

Table 3.4 Use Case Narrative for “Access Sign-In Page”**Error! Bookmark not defined.**

Table 3.5 Use Case Narrative for “Sign in using username and passwords”**Error! Bookmark not defined.**

Table 3.6 Use Case Narrative for “Sign in using Face Recognition”.....**Error! Bookmark not defined.**

Table 3.7 Use Case Narrative for “Account Recovery Page”**Error! Bookmark not defined.**

Table 3.8 Use Case Narrative for “Access Dashboard” .**Error! Bookmark not defined.**

Table 3.9 Use Case Narrative for “Save Password for The Other Website”**Error! Bookmark not defined.**

Table 3.10 Use Case Narrative for “Get Username and Password Recommendation” .....**Error! Bookmark not defined.**

Table 3.11 Use Case Narrative for “Access the Account Details for The Other Website”.....**Error! Bookmark not defined.**

Table 3.12 Use Case Narrative for “Edit the Account Details for the Other Websites” Use Case.....**Error! Bookmark not defined.**

Table 4.1 Label Description from Figure 4.1……..**Error! Bookmark not defined.**

Table 4.2 Label Description from Figure 4.2 and 4.3**Error! Bookmark not defined.**

Table 4.3 Label Description from Figure 4.4 ..**Error! Bookmark not defined.**

Table 4.4 Label Description from Figure 4.5, 4.6, and 4.7**Error! Bookmark not defined.**

Table 4.5 Label Description from Figure 4.8 and 4.9**Error! Bookmark not defined.**

Table 6.1 Create Account Page Testing Scenario**Error! Bookmark not defined.**

Table 6.2 Sign-In Page Testing Scenario..... **Error! Bookmark not defined.**
Table 6.3 Account Recovery Page Testing Scenario **Error! Bookmark not defined.**
Table 6.4 Dashboard Page Testing Scenario ... **Error! Bookmark not defined.**
Table 6.5 Account Details Page Testing Scenario **Error! Bookmark not defined.**

LIST OF FIGURES

Figure 1.1 Rapid Application Development Methodology**Error! Bookmark not defined.**

Figure 2.1 Fisher-Yates Shuffle Algorithm Explanation**Error! Bookmark not defined.**

Figure 2.2 Fisher-Yates Shuffle Algorithm Explanation**Error! Bookmark not defined.**

Figure 2.3 Fisher-Yates Shuffle Algorithm Explanation**Error! Bookmark not defined.**

Figure 2.4 Fisher-Yates Shuffle Algorithm Explanation**Error! Bookmark not defined.**

Figure 2.5 Fisher-Yates Shuffle Algorithm Explanation**Error! Bookmark not defined.**

Figure 2.6 Network structure of P-Net .....**Error! Bookmark not defined.**

Figure 2.7 Network structure of R-Net.....**Error! Bookmark not defined.**

Figure 2.8 Network structure of O-Net.....**Error! Bookmark not defined.**

Figure 3.1 Use Case Diagram .....**Error! Bookmark not defined.**

Figure 3.2 Swimlane Diagram of Create Account**Error! Bookmark not defined.**

Figure 4.1 Sign-In Page Design .....**Error! Bookmark not defined.**

Figure 4.2 Face Recognition Page Design.....**Error! Bookmark not defined.**

Figure 4.3 Account Recovery Page Design .....**Error! Bookmark not defined.**

Figure 4.4 Dashboard Page Design.....**Error! Bookmark not defined.**

Figure 4.5 Dashboard Page Design.....**Error! Bookmark not defined.**

Figure 4.6 Dashboard Page Design.....**Error! Bookmark not defined.**

Figure 4.7 Details of Other Website Account Page Design**Error! Bookmark not defined.**

Figure 4.8 Details of Other Website Account Page Design**Error! Bookmark not defined.**

Figure 4.9 Class Diagram of The Application.**Error! Bookmark not defined.**

Figure 5.1 Sign-Up Page Interface.....**Error! Bookmark not defined.**

Figure 5.2 Sign-Up Page Interface.....**Error! Bookmark not defined.**

Figure 5.3 The Code of The Sign-Up Page Interface**Error! Bookmark not defined.**

Figure 5.4 The TypeScript Code for Sign-up ..**Error! Bookmark not defined.**

Figure 5.5 The Code for The Username Recommendation**Error! Bookmark not defined.**

Figure 5.6 Sign-In Page Interface ..... **Error! Bookmark not defined.**

Figure 5.7 Sign-In Page Interface ..... **Error! Bookmark not defined.**

Figure 5.8 The Code of The Sign-in Interface. **Error! Bookmark not defined.**

Figure 5.9 The Code of the Face Recognition Interface. **Error! Bookmark not defined.**

Figure 5.10 The TypeScript Code for Sign-in . **Error! Bookmark not defined.**

Figure 5.11 The TypeScript Code for Face-Recognition **Error! Bookmark not defined.**

Figure 5.12 Account Recovery Page Interface **Error! Bookmark not defined.**

Figure 5.13 The Code of the Account Recovery Page interface **Error! Bookmark not defined.**

Figure 5.14 The TypeScript Code for Account Recovery Page **Error! Bookmark not defined.**

Figure 5.15 Dashboard Page Interface ..... **Error! Bookmark not defined.**

Figure 5.16 Dashboard Page Interface ..... **Error! Bookmark not defined.**

Figure 5.17 The Code of The Dashboard Page Interface **Error! Bookmark not defined.**

Figure 5.18 The TypeScript Code for The Dashboard Page **Error! Bookmark not defined.**

Figure 5.19 The TypeScript Code for The Dashboard Page **Error! Bookmark not defined.**

Figure 5.20 The Code for The Username Recommendation **Error! Bookmark not defined.**

Figure 5.21 The Details of Other Website Account Page Interface **Error! Bookmark not defined.**

Figure 5.22 The Details of Other Website Account Page Interface **Error! Bookmark not defined.**

Figure 5.23 The Code of The Details Page Interface **Error! Bookmark not defined.**

Figure 5.24 The TypeScript Code for The Details Page. **Error! Bookmark not defined.**