

**DURIO THE KING OF FRUITS – TWO-DIMENSIONAL (2D) PLATFORMER GAME
RANDOM LEVEL BASED ON DIFFICULTIES LEVEL**



UNIVERSITI TEKNIKAL MALAYSIA MELAKA

**DURIO THE KING OF FRUITS – TWO-DIMENSIONAL (2D) PLATFORMER
GAME RANDOM LEVEL BASED ON DIFFICULTIES LEVEL**

AHMAD FITRI BIN AHMAD



This report is submitted in partial fulfillment of the requirements for the Bachelor of [Computer Science (Software Development)] with Honours.

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

**FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY
UNIVERSITI TEKNIKAL MALAYSIA MELAKA**

2022/2023

DECLARATION

I hereby declare that this project report entitled
**[DURIO THE KING OF FRUITS- TWO-DIMENSIONAL (2D) PLATFORMER
GAME RANDOM LEVEL BASED ON DIFFICULTIES LEVEL**
is written by me and is my own effort and that no part has been plagiarized
without citations.

STUDENT : _____ Date : 30JUNE 2023
(AHMAD FITRI BIN AHMAD)



I hereby declare that I have read this project report and found
this project report is sufficient in term of the scope and quality for the award of
Bachelor of [Computer Science (Software Development)] with Honours.

SUPERVISOR : _____ Date : 30 JUNE 2023
(TS. DR HAMZAH ASYRANI)

DECLARATION

DEDICATION

To my beloved parents, I dedicate this report to you. You have always been my biggest supporters, and I would not be where I am today without your love and guidance. You have instilled in me a love of learning and a strong work ethic. I am so grateful for everything you have done for me.



ACKNOWLEDGEMENTS

I would like to thank Ts.Dr Hamzah Asyrani for giving me the opportunity to complete this project and for his valuable assistance throughout the process. His guidance and support were invaluable, and I am grateful for his willingness to share his knowledge and expertise with me.

I would also like to thank my beloved parents who have been giving me support and motivation throughout my project. Their encouragement and belief in me helped me to stay focused and motivated, and I am so grateful for their love and support.



ABSTRACT

This project focus on developing a game that integrated with random levels. Durio the King of Fruits is a 2D platformer game with randomly generated levels based on difficulty levels. Players control Durio, a spiky fruit who must jump, climb, and slide through a variety of levels to reach the end. The levels are randomly generated, so each time you play, the experience is different. The difficulty levels range from easy to hard, so players of all skill levels can enjoy the game. The game features a variety of power-ups that can help players progress through the levels. These power-ups include extra jumps, invincibility, and speed boosts. The game also features a variety of enemies that players must avoid or defeat. These enemies include spikes, falling rocks, and other fruits. Durio the King of Fruits is a challenging and fun game that is sure to entertain players of all ages. The randomly generated levels provide a new challenge each time you play, and the power-ups and enemies keep the game fresh. If players are looking for a fun and challenging platformer game, then Durio the King of Fruits is the game for them.

اونيورسيتي تيكنيكل مليسيا ملاك

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

ABSTRAK

Projek ini memberi tumpuan kepada membangunkan permainan yang disepadukan dengan tahap rawak. Durio the King of Fruits ialah permainan platformer 2D dengan tahap yang dijana secara rawak berdasarkan tahap kesukaran. Pemain mengawal Durio, buah berduri yang mesti melompat, memanjat, dan meluncur melalui pelbagai peringkat untuk mencapai penghujung. Tahap dijana secara rawak, jadi setiap kali anda bermain, pengalamannya berbeza. Tahap kesukaran terdiri daripada mudah kepada sukar, jadi pemain dari semua tahap kemahiran boleh menikmati permainan. Permainan ini menampilkan pelbagai power-up yang boleh membantu pemain maju melalui tahap. Peningkatan kuasa ini termasuk lompatan tambahan, kebal dan peningkatan kelajuan. Permainan ini juga menampilkan pelbagai musuh yang pemain mesti elak atau kalahkan. Musuh ini termasuk pancang, batu yang jatuh dan buah-buahan lain. Durio the King of Fruits ialah permainan yang mencabar dan menyeronokkan yang pasti menghiburkan pemain dari semua peringkat umur. Tahap yang dijana secara rawak memberikan cabaran baharu setiap kali anda bermain, dan peningkatan kuasa serta musuh mengekalkan permainan itu segar. Jika pemain sedang mencari permainan platformer yang menyeronokkan dan mencabar, maka Durio the King of Fruits adalah permainan untuk mereka.

اونيور سيتي تيكنيكل مليسيا ملاك

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

TABLE OF CONTENTS

DECLARATION.....	II
DECLARATION.....	II
DEDICATION.....	III
ACKNOWLEDGEMENTS.....	IV
ABSTRACT.....	V
ABSTRAK.....	VI
LIST OF TABLES.....	XI
LIST OF FIGURES.....	XII
LIST OF ABBREVIATIONS.....	XIV
LIST OF ATTACHMENTS.....	XV
CHAPTER 1: INTRODUCTION.....	16
1.1 Project Background.....	16
1.2 Problem Statement.....	16
1.3 Objective.....	17
1.4 Goals and Genre.....	17
1.5 Game Features.....	17
1.6 Conclusion.....	17
CHAPTER 2: LITERATURE REVIEW AND PROJECT METHODOLOGY.....	18
2.1 Introduction.....	18
2.2 Genre.....	18
2.3 Existing Games.....	18
2.4 Comparison of Existing Games.....	24
2.5 Project Methodology.....	26

2.6	Conclusion	27
CHAPTER 3: ANALYSIS.....		28
3.1	Requirement Analysis.....	28
3.1.1	Project Requirements.....	28
3.1.2	Technical Requirement.....	29
3.1.3	Software Requirement	30
3.1.4	Hardware Requirements	30
3.2	Project Schedule And Milestone.....	31
3.3	Conclusion	31
CHAPTER 4: DESIGN.....		32
4.1	Introduction.....	32
4.2	Game Architecture	32
4.3	Game Design.....	32
4.3.1	Gameplay	32
4.3.2	Core Mechanics	33
4.3.3	Flowboard	35
4.3.4	Level Progression	36
4.3.5	Storyline.....	36
4.3.6	User Interface / Interaction Model.....	37
4.4	Game Art.....	39
4.5	Conclusion	41
CHAPTER 5: IMPLEMENTATION.....		42
5.1	Introduction.....	42
5.2	Creation of Game Art.....	42
5.2.1	Production of Graphics	42

5.2.2	Production of Audio	45
5.2.3	Production of Video.....	45
5.3	Integration of Game Components.....	47
5.4	Game Configuration Management.....	48
5.4.1	Configuration Setup.....	49
5.4.2	Version Control Procedure	49
5.5	Implementation Status	50
5.6	Conclusion	51
CHAPTER 6: TESTING		52
6.1	Introduction.....	52
6.2	Test Plan.....	52
6.2.1	Test Organization.....	52
6.2.2	Test Environment.....	53
6.2.3	Test Schedule.....	54
6.3	Test Implementation.....	54
6.4	Test Result and Analysis.....	54
6.5	Conclusion	61
CHAPTER 7: PROJECT CONCLUSION		62
7.1	Introduction.....	62
7.2	Observation of Strength and Weakness	62
7.3	Proposition for Improvement.....	62
7.4	Contribution	63
7.5	Conclusion	63
REFERENCES.....		64

APPENDIX	65
APPENDIX A	65
APPENDIX B	82



LIST OF TABLES

Table 2. 1 Comparison of Super Mario Bros 3, Ori and The Blind Forest and Hollow Knight.....	25
Table 3. 1 Existing Game Analysis	28
Table 3. 2 Project Timeline	31
Table 5. 1 Audio in game	45
Table 5. 2 Testing Phase	50
Table 5. 3 Implementation Status	51
Table 6. 1 Type of Test.....	53



LIST OF FIGURES

Figure 2. 1 Super Mario Logo.....	19
Figure 2. 2 Choose Player.....	19
Figure 2. 3 Collect coins.....	20
Figure 2. 4 Final Scene.....	20
Figure 2. 5 Ori And The Blind Forest logo.....	21
Figure 2. 6 Forest theme.....	22
Figure 2. 7 Boss Enemy.....	22
Figure 2. 8 Hollow Knight Logo.....	23
Figure 2. 9 Dungeon Dark Theme.....	23
Figure 2. 10 Hollow Knight Boss Enemy.....	24
Figure 2. 11 Game Development Life Cycle (GDLC).....	26
Figure 4. 1 Game Architecture.....	
Figure 4. 2 Game Flowboard.....	32
Figure 4. 3 Level Design.....	35
Figure 4. 4 UI Sketch.....	36
Figure 4. 5 Main Menu.....	37
Figure 4. 6 Instructions.....	37
Figure 4. 7 Gameplay.....	38
Figure 4. 8 Player UI.....	38
Figure 4. 9 Game World.....	39
Figure 4. 10 Durio.....	39
Figure 4. 10 Durio.....	40
Figure 4. 11 Painapel.....	40
Figure 4. 12 Apel.....	40
Figure 4. 12 Apel.....	41
Figure 5. 1 Moving Platform.....	
Figure 5. 2 Enemy Painapel.....	43
Figure 5. 2 Enemy Painapel.....	43
Figure 5. 3 Enemy Apel.....	44
Figure 5. 3 Enemy Apel.....	44
Figure 5. 4 Wind Generator.....	44
Figure 5. 4 Wind Generator.....	44
Figure 5. 5 Main Character Idle Animation.....	45
Figure 5. 5 Main Character Idle Animation.....	45
Figure 5. 6 Main Character Run Animation.....	46
Figure 5. 6 Main Character Run Animation.....	46

Figure 5. 7 Main Character Jump Animation.....	46
Figure 5. 8 Main Character Attack Animation.....	46
Figure 6. 1 Gender.....	54
Figure 6. 2Age.....	55
Figure 6. 3 Gamer	55
Figure 6. 4 Learn	56
Figure 6. 5 Instruction	56
Figure 6. 6 Main Menu	57
Figure 6. 7 Easy to play.....	57
Figure 6. 8 Challenging.....	58
Figure 6. 9 Terms of game.....	58
Figure 6. 10 Enemy	59
Figure 6. 11 Interested	59
Figure 6. 12 Platformer.....	60
Figure 6. 13 Hard	60



اونيورسيتي تيكنيكل مليسيا ملاك

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

LIST OF ABBREVIATIONS

FYP	-	Final Year Project
GDLC	-	Game Development Life Cycle
AI	-	Artificial Intelligent
UI	-	User Interface
GUI	-	Graphical User Interface
2D	-	Two Dimensional



اونيورسيتي تيكنيكل مليسيا ملاك

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

LIST OF ATTACHMENTS

		PAGE
Appendix A	Script	49
Appendix B	Project Timeline	66



CHAPTER 1: INTRODUCTION

1.1 Project Background

The goal of the project is to create a 2D platformer with an in-game random level generator. Every level of the game features a unique puzzle. The mechanism for generating random levels is one of the game's key elements. Each replay is unique and difficult thanks to the system's usage of algorithms to generate custom puzzle problems for users. In order to provide the best possible gaming, the difficulty levels are also produced at random and are matched to the skill level of the player.

1.2 Problem Statement

The traditional approach to designing puzzle games is to create static levels that offer a predetermined set of challenges. However, this approach can lead to a repetitive and predictable gameplay experience. The problem with this approach is that it does not offer players the variability and unpredictability that they desire in a puzzle game.

To address this problem, "Durio The King of Fruits" uses random level generation, which generates unique levels for each playthrough. This approach ensures that the game remains fresh and exciting, providing players with a new experience every time they play.

The challenge with this approach is to create a random puzzle generation system that generates levels that are both challenging and engaging. The system must also match the player's skill level, providing a gameplay experience that is neither too easy nor too difficult.

1.3 Objective

This project embarks on the following objectives:

- i. To study how the use of random level generation affects player engagement. This involves analyzing player feedback and behavior to determine whether the system is effective in creating a challenging and engaging gameplay experience. To build and make various combo attacks as game mechanics.
- ii. To develop a random level generation system that is both effective and efficient. This involves researching and implementing algorithms that generate levels that are challenging, engaging, and match the player's skill level.
- iii. To evaluate the game's overall success in the market. This involves analyzing sales data, player feedback, and critical reviews to determine whether the game meets expectations and achieves its goals.

1.4 Goals and Genre

The game is about a fruit Durian named Durio who fought with others fruit to be the best among them. On his way to become the best, he must fight various fruits from each level and defeat them. All levels have different obstacles and fruits, so the player needs to move carefully before moving forward.

Platformer is the main genre in this game. The sub-genre in this project is action because the player can kill enemy.

1.5 Game Features

The target audiences and groups for the game are for players who likes 2D game and face new challenges when they play new game.

Players must survive and find a way out of the forest.

1.6 Conclusion

The expected outcome of "Durio The King of Fruits" is a successful and engaging 2D platformer game that utilizes random level generation to provide players with a fresh and challenging gameplay experience every time they play. The game's vibrant visual design, coupled with its unique and challenging gameplay mechanics, is expected to attract a wide audience of puzzle game fans, as well as fans of the durian fruit. The game's success will be measured

by positive critical reviews, high player engagement, and strong sales figures, all of which will contribute to the overall success of the game.

CHAPTER 2: LITERATURE REVIEW AND PROJECT METHODOLOGY

2.1 Introduction

This chapter will cover the game's genre, the project's list of relevant existing games, a comparison of those games, and the project's methodology.

2.2 Genre

Video games known as "platformers" let players control a character who navigates a number of levels by jumping and climbing between platforms. Objects like holes, spikes, and adversaries are frequently present throughout the levels as obstacles. In order to get through these challenges and finish the level, players must employ the climbing and leaping skills of their character.

Platformers can have varying levels of difficulty. Platform games vary in their intended audience, with some catering to more casual players and others to more seasoned ones. The amount and variety of obstacles in each level, as well as how quickly the player must advance, frequently determine how challenging a game is.

2.3 Existing Games

1. Super Mario Bros. 3

A legitimate sequel to Super Mario Bros. was Super Mario Bros. 3. It offered bigger levels, fresh power-ups, and more inventive gameplay. These innovations gave the game a new, exhilarating vibe and paved the stage for future Mario games. Super Mario Bros. 3's stages were larger and more intricate than those in the first game. They also have additional hidden power-ups and extra levels to find. Players had to carefully explore the

levels in order to uncover everything, which increased the game's difficulty and rewards. Super Mario Bros. 3 added additional power-ups in addition to the larger stages.

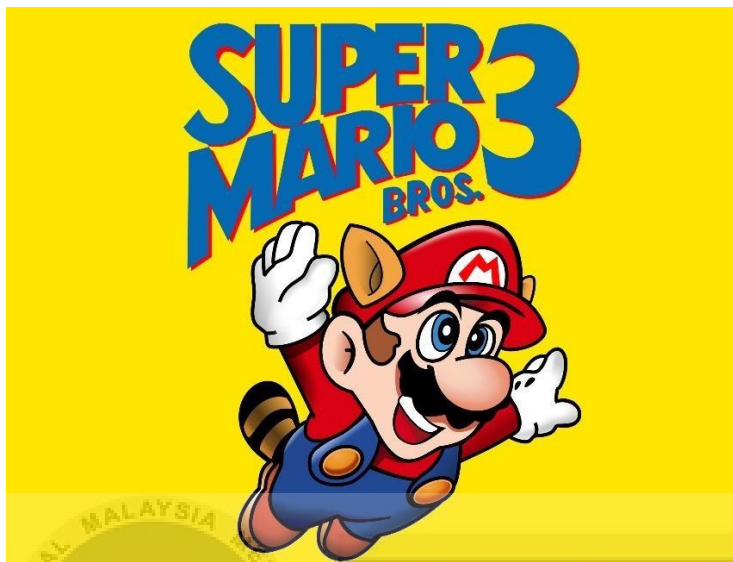


Figure 2. 1 Super Mario Logo

This is the main character of Super Mario Bros 3 named Mario



Figure 2. 2 Choose Player

The player can decide to play with friends.



Figure 2. 3Collect coins

Mario needs to collect coin as point in the game

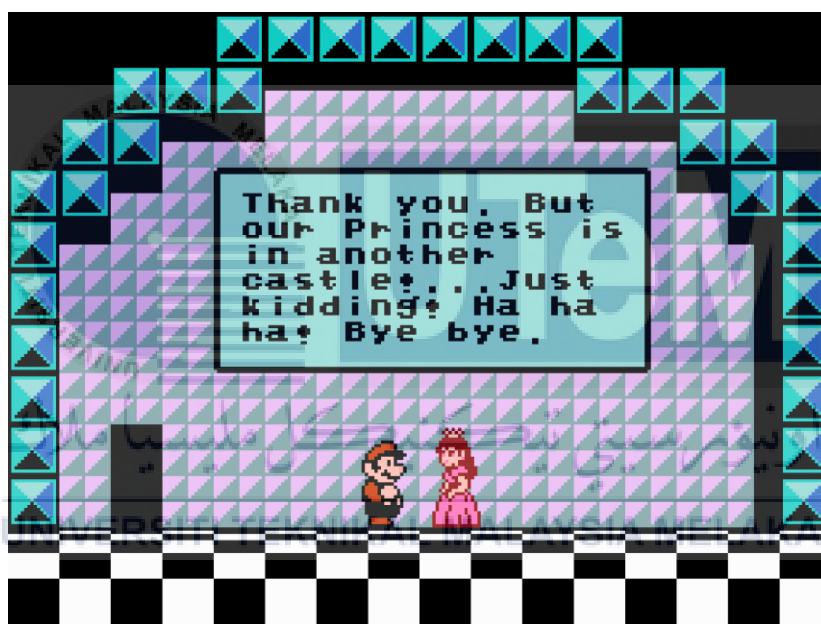


Figure 2. 4 Final Scene

This is the final scene after Mario completes all levels. He saves the princess from traps in the castle.

2. Ori And The Blind Forest

A beautiful story, stirring soundtrack, and the best aspects of Metroidvanias come together in Ori and the Blind Forest to create an aesthetically gorgeous and emotionally stirring game. The bioluminescent graphics and audio of the game are both just amazing. Additionally, the narrative is exceptionally well-written and will stick with the player long after they have finished the game.

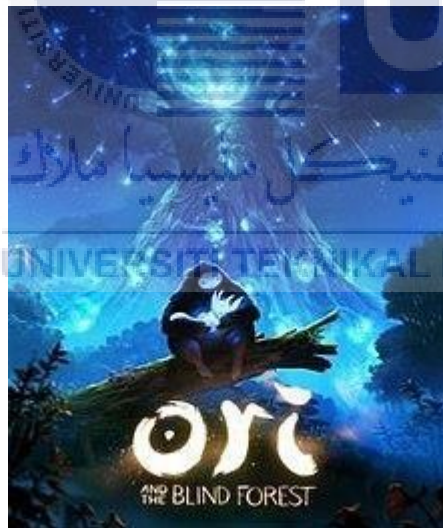


Figure 2. 5 Ori And The Blind Forest logo



Figure 2. 6 Forest theme



Figure 2. 7 Boss Enemy

اونيورسيتي تيكنيكل مليسيا ملاك

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

3. Hollow Knight

A well-known action-adventure game named Hollow Knight takes place in Hallownest, a crumbling underground kingdom. A little knight that the player controls journeys across the realm, engages in conflict with foes, and unearths its mysteries. Intense action, gorgeous hand-drawn graphics, and