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| |  |  |  | | --- | --- | --- | | ***Credit Hours System***  ***CMPN402***  ***Machine Intelligence***  ***Spring 2019*** |  | ***Cairo University Faculty of Engineering*** | |
| *Wehrmacht Team* |
| *Scrabble Game* |
|  |
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Abstract

[Insert Abstract]

Table of Contents

[Abstract 1](#_Toc1786228)

[List of Figures 5](#_Toc1786229)

[List of Tables 6](#_Toc1786230)

[Team Contacts 7](#_Toc1786231)

[1. Introduction 9](#_Toc1786232)

[1.1 About Scrabble 9](#_Toc1786233)

[1.2 History of Scrabble 9](#_Toc1786234)

[1.3 Game Rules 9](#_Toc1786235)

[1.3.1 Notation System 9](#_Toc1786236)

[1.3.2 Sequence of Play 9](#_Toc1786237)

[1.3.3 Making a Play 9](#_Toc1786238)

[1.3.4 End of Game 9](#_Toc1786239)

[1.3.5 Scoring 9](#_Toc1786240)

[1.3.6 Acceptable Words 9](#_Toc1786241)

[1.3.7 Challenges 9](#_Toc1786242)

[2. Market Survey 11](#_Toc1786243)

[2.1 Intended Customers 11](#_Toc1786245)

[2.2 Online Gaming Marketing Analysis 11](#_Toc1786246)

[2.3 Popularity of Scrabble 11](#_Toc1786247)

[2.4 Scrabble games in the Market 11](#_Toc1786248)

[2.4.1 Quackle 11](#_Toc1786249)

[2.4.2 Maven 11](#_Toc1786250)

[3. Research 13](#_Toc1786251)

[3.1 Board Representation 13](#_Toc1786253)

[3.1.1 Sub 13](#_Toc1786254)

[3.1.2 Sub 2 13](#_Toc1786255)

[3.2 Move Generation 13](#_Toc1786256)

[3.2.1 Sub 13](#_Toc1786257)

[3.3 Searching the Best State 13](#_Toc1786258)

[3.3.1 Search Tree 13](#_Toc1786259)

[3.3.2 Search Algorithms 13](#_Toc1786260)

[3.3.3 Depth-First Search 13](#_Toc1786261)

[3.4 State Evaluation 13](#_Toc1786262)

[3.5 Game Implementation 13](#_Toc1786263)

[3.5.1 Programming Language 13](#_Toc1786264)

[3.5.2 Libraries 13](#_Toc1786265)

[3.5.3 Implemented Projects 13](#_Toc1786266)

[4. GUI 15](#_Toc1786267)

[4.1 Phase 1: Preparation 15](#_Toc1786269)

[4.2 Phase 2: Implementation 15](#_Toc1786270)

[5. Implementation 17](#_Toc1786271)

[5.1 Game Rules Phase 1 18](#_Toc1786273)

[5.1.1 Algorithms Used 18](#_Toc1786274)

[5.1.2 Challenges Faced 18](#_Toc1786275)

[5.1.3 Code Implementation 18](#_Toc1786276)

[5.2 Board Representation and Move Generation 18](#_Toc1786277)

[5.2.1 Algorithms Used 18](#_Toc1786278)

[5.2.2 Challenges Faced 18](#_Toc1786279)

[5.2.3 Code Implementation 18](#_Toc1786280)

[5.3 Evaluation 18](#_Toc1786281)

[5.3.1 Algorithms Used 18](#_Toc1786282)

[5.3.2 Challenges Faced 18](#_Toc1786283)

[5.3.3 Code Implementation 18](#_Toc1786284)

[5.4 Optimized Move Generation 18](#_Toc1786285)

[5.4.1 Algorithms Used 18](#_Toc1786286)

[5.4.2 Challenges Faced 18](#_Toc1786287)

[5.4.3 Code Implementation 18](#_Toc1786288)

[5.5 Searching Phase 18](#_Toc1786289)

[5.5.1 Algorithms Used 18](#_Toc1786290)

[5.5.2 Challenges Faced 18](#_Toc1786291)

[5.5.3 Code Implementation 18](#_Toc1786292)

[5.6 Quiescence Search 18](#_Toc1786293)

[5.6.1 Algorithms Used 18](#_Toc1786294)

[5.6.2 Challenges Faced 18](#_Toc1786295)

[5.6.3 Code Implementation 18](#_Toc1786296)

[6. Communication 20](#_Toc1786297)

[6.1 Send to the server 20](#_Toc1786299)

[6.1.1 Sub 20](#_Toc1786300)

[6.2 Receive from the server 20](#_Toc1786301)

[6.2.1 Sub 20](#_Toc1786302)

[7. Integration 22](#_Toc1786303)

[8. Testing 24](#_Toc1786305)

[8.1 Testing Plan 24](#_Toc1786307)

[8.1.1 Unit Testing 24](#_Toc1786308)

[8.1.2 Module Testing 24](#_Toc1786309)

[8.2 Testing Phases 24](#_Toc1786310)

[8.2.1 Sub 24](#_Toc1786311)

[8.3 Evaluation’s Test Cases 24](#_Toc1786312)

[8.3.1 THIS IS THE LONGEST PART OF THE REPORT 24](#_Toc1786313)

[9. Tools Used 26](#_Toc1786314)

[9.1 Python 26](#_Toc1786316)

[9.2 C++ 26](#_Toc1786317)

[9.3 C# 26](#_Toc1786318)

[9.4 Unity 26](#_Toc1786319)

[10. Conclusion and Future Scope 28](#_Toc1786320)

[11. References 30](#_Toc1786321)

[11.1 Introduction References 30](#_Toc1786324)

[11.2 Market Survey References 30](#_Toc1786325)

[11.3 Research References 30](#_Toc1786326)

[11.4 Implementation References 30](#_Toc1786327)

[11.5 Testing References 30](#_Toc1786328)

List of Figures

**No table of figures entries found.**

List of Tables

[Inset List of Tables]

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| Omar Osama Saleh | 1132225 |  | Research |
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| Amr Khaled | 1152003 |  | Implementation |
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| Mohamed Basel Mohamed | 1152253 |  | Implementation |
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| Mostafa Mufeed | 1162249 |  | Documentation |

Section 1: Introduction



1. Introduction

## About Scrabble

Scrabble is a word game in which two to four players score points by placing tiles bearing a single letter onto a board divided into a 15×15 grid of squares. The tiles must form words that, in crossword fashion, read left to right in rows or downward in columns, and be included in a standard dictionary or lexicon.

The name is a trademark of Mattel in most of the world, but of Hasbro, Inc. in the United States and Canada. The game is sold in 121 countries and is available in 29 languages; approximately 150 million sets have been sold worldwide and roughly one-third of American and half of British homes have a Scrabble set. There are around 4,000 Scrabble clubs around the world.

## History of Scrabble

In 1938, American architect Alfred Mosher Butts created the game as a variation on an earlier word game he invented called Lexiko. The two games had the same set of letter tiles, whose distributions and point values Butts worked out by performing a frequency analysis of letters from various sources, including The New York Times. The new game, which he called "Criss-Crosswords," added the 15×15 gameboard and the crossword-style game play. He manufactured a few sets himself, but was not successful in selling the game to any major game manufacturers of the day.

## Game Rules

### Notation System

### Sequence of Play

### Making a Play

### End of Game

### Scoring

### Acceptable Words

### Challenges

Section 2: Market Survey

2. Market Survey



## Intended Customers

Our main targeted customers are:

* Gamers who love challenging games
* Lovers of Scrabble
* Gaming Software Developers

## Online Gaming Marketing Analysis

Online gaming market is expected to witness substantial growth over the forecast period. This may be attributed to increasing number of users taking up online gaming as an entertainment tool, the following figure represents how much people have consumed in online Gaming during the past few years.

[INSERT FIGURE]

And according to a lot of Statistics:

* The average age of gamers: 35
* The average age of game purchasers: 38
* Households that own a device used for playing video games: 65%
* Households that own a device exclusively for playing video games: 48%
* The average number of years gamers have been playing: 13

## Popularity of Scrabble

Scrabble is very popular among both men and women…

## Scrabble games in the Market

### Quackle

### Maven

Section 3: Research

3. Research



## Board Representation

### Sub

### Sub 2

## Move Generation

### Sub

## Searching the Best State

### Search Tree

### Search Algorithms

### Depth-First Search

## State Evaluation

## Game Implementation

### Programming Language

### Libraries

### Implemented Projects

Section 4: GUI

4. GUI



## Phase 1: Preparation

One of the important (if not the most) factor of enjoying games is in its graphics and GUI. So we decided to implement a simple yet beautiful design to our Scrabble game. While doing the market research, we found out that the Unity engine is one of leading platforms in the industry while also being easy to learn so we went with it.

## Phase 2: Implementation

FILL TEXT

[Insert Final GUI Figure]

Section 5: Implementation

5. Implementation



## Game Rules Phase 1

### Algorithms Used

### Challenges Faced

### Code Implementation

## Board Representation and Move Generation

### Algorithms Used

### Challenges Faced

### Code Implementation

## Evaluation

### Algorithms Used

### Challenges Faced

### Code Implementation

## Optimized Move Generation

### Algorithms Used

### Challenges Faced

### Code Implementation

## Searching Phase

### Algorithms Used

### Challenges Faced

### Code Implementation

## Quiescence Search

### Algorithms Used

### Challenges Faced

### Code Implementation

Section 6:  Communication

6. Communication



## Send to the server

### Sub

## Receive from the server

### Sub

Section 7: Integration

7. Integration



The integration team have used Unity for the GUI implementation and C# for the game logic.

[INSERT INTEGRATION FIGURE]

Section 8:  Testing

8. Testing



## Testing Plan

### Unit Testing

### Module Testing

## Testing Phases

### Sub

## Evaluation’s Test Cases

### THIS IS THE LONGEST PART OF THE REPORT

[Insert table for each test case]

Section 9:  Tools Used

9. Tools Used



## Python

Python is a programming language. It's used for many different applications. It's used in some high schools and colleges as an introductory programming language because Python is easy to learn, but it's also used by professional software developers at organizations, such as Google, NASA, and Lucasfilm Ltd.

[Insert Python Logo]

## C++

C++ is a general-purpose programming language. It has imperative, object-oriented and generic programming features, while also providing facilities for low-level memory manipulation

[Insert C++ Logo]

## C#

C# is a multi-paradigm programming language encompassing strong typing, imperative, declarative, functional, generic, object-oriented, and component-oriented programming disciplines.

[Insert C# Logo]

## Unity

Unity is a cross-platform game engine developed by Unity Technologies, which is primarily used to develop both three-dimensional and two-dimensional video games and simulations for computers, consoles, and mobile devices.

[Insert Unity Logo]

Section 10: Conclusion and Future Scope

10. Conclusion and Future Scope

In a nutshell,

Our future scope,

Section 11: References

11. References



## Introduction References

* Reference 1
* Reference 2

## Market Survey References

* Reference 1
* Reference 2

## Research References

* Reference 1
* Reference 2

## Implementation References

* Reference 1
* Reference 2

## Testing References

* Reference 1
* Reference 2