# Deliverables #2: The Programmer's Manual

## 1. Introduction

### 1.1 Scope

Group 2 will be developing a digital Scrabble-style game as our semester project. The core game mode will be a single-player, time-based game in which the user takes successive turns attempting to reach a target score before time expires. The required score and time limit will be determined by the selected difficulty level (easy, medium, or hard). All word placement rules, tile distribution, and board scoring will follow the standard rules of traditional Scrabble. The player will be provided with seven randomly drawn letter tiles and will draw new tiles after each turn to maintain a rack of seven tiles. The automatic word validation will be based on the SOWPODS dictionary.

If time permits, the following features will be implemented in the order listed:

- A two-player local pass-and-play mode following traditional Scrabble rules.
- A boss battler mode that introduces additional rogue-like mechanics layered onto the time-based single-player mode.
- A two-player mode against a computer-controlled opponent utilizing basic artificial intelligence.

The game will be implemented in Java using a graphical user interface built with JavaFX. The final application will be packaged as an executable JAR file, allowing it to run on Windows, macOS, and Linux systems with a compatible Java Runtime Environment installed. The software will function as a standalone application and will not require any additional software beyond the Java runtime.

### 1.2 Definitions, Acronoyms, & Abbreviations

#### Definitions

**Board** – The 15 x 15 grid on which tiles are placed to form words.

**Tile** – A letter piece with an associated point value. A standard set contains 100 tiles including two blanks.

**Rack** – The holder containing up to seven tiles available to a player.

**Bag** – The pool containing all un-played tiles from which new tiles are drawn.

**Turn** – A single move in which a player places a word, exchanges tiles, or passes.

**Bingo** – A move in which all seven tiles are played in a single turn, awarding a point bonus.

**Rack Leave** – Tiles remaining after a move.

**Exchange** – Replacing one or more tiles with new ones from the bag.

**Pass** – A turn where no tiles are played.

**Premium Square** – A special board square that modifies score:

- Double Letter (DL)
- Triple Letter (TL)
- Double Word (DW)
- Triple Word (TW)

**Cross Word** – A secondary word formed perpendicular to the main word placement.

**Target Score** – The required number of points the player must reach before the timer expires.

**Difficulty Level** – Game setting (Easy, Medium, Hard) that determines time limit and required target score.

**Automatic Word Validation** – System-based verification that a word exists in the approved dictionary before scoring.

**Time-Based Mode** – Single-player mode where the player must reach a target score within a fixed time limit.

**Pass-and-Play Mode** – Local two-player mode where players alternate using the same device.

**Boss Battler Mode** – Optional rogue-like variant introducing additional mechanics layered onto standard gameplay.

**Score Multiplier** – The cumulative effect of premium squares applied during a turn.

**Seeded Randomization** – Pseudorandom tile generation method.

## Acronyms & Abbreviations

**WESPA** – World English-Language Scrabble Players Association; governs international competitive Scrabble.

**NASPA** – North American Scrabble Players Association; governs North American competitive Scrabble.

**NWL** – NASPA Word List; official tournament word list used in the United States and Canada.

**CSW** – Collins Scrabble Words; international word list.

**SOWPODS** – Former name for CSW; derived from combining UK and US word lists.

**DL** – Double Letter.

**TL** – Triple Letter.

**DW** – Double Word.

**TW** – Triple Word.

**OT** – Overtime.

**UI** – User Interface.

**GUI** – Graphical User Interface.

**JRE** – Java Runtime Environment.

**JAR** – Java Archive file format used to distribute Java applications.

## 1.3 References

### Scrabble Rules


Team, H. C. (n.d.). *SCRABBLE*. Hasbro Instructions. https://instructions.hasbro.com/en-us/instruction/scrabble-board-game

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### Word List


*NASPA Word List - NASPAWiki*. (n.d.). https://scrabbleplayers.org/w/NASPA_Word_List

Scrabble & Word Finder, Collins Dictionary. (2025). Official Word Lists - Scrabble & Word Finder | Collins Dictionary. In *Scrabble & Word Finder | Collins Dictionary*. https://scrabble.collinsdictionary.com/word-lists/


### Tools


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# 2. General Description

## 2.1 Product Perspective

This software reimagines the traditional Scrabble experience as a time-based single-player game for desktop users. While Scrabble is typically played as a turn-based game with multiple players, this version shifts the focus to a solo challenge requiring quick thinking and strategic word placement under time constraints. The base application provides an engaging way to enjoy the core mechanics of Scrabble without requiring physical materials or additional players, making it a more flexible and accessible option for casual gaming.

## 2.2 Product Functions

The base game will display a scabble board and seven-tile player rack through a GUI, allowing the player to place tiles to form words according to placement rules. The system will validate the words played against the CSW / NWL dictionary and automatically calculate scoring using traditional / tournament Scrabble scoring with project-specific adjustments as needed. The base game is time-based: the player must reach a target score before the timer expires, with difficulty settings determining the time limit and required score. The game ends when the player meets the win condition or when time runs out.

## 2.3 User Characteristics

The end users of the application are individuals who enjoy casual word and puzzle games, such as Scrabble or mobile games like Candy Crush. These end users are expected to have basic computer proficiency and familiarity with graphical interfaces, including clicking, dragging, and interacting with on-screen elements. No other specialized knowledge is required. The end users may range from college students to general desktop users.

## 2.4 General Constraints

1. The application will be built using Java and JavaFX.
2. It must run as a standalone executable JAR.
3. It must run on Windows, macOS, and Linux with a compatible JRE installed.
4. The application will have no network or multiplayer online features and will be local-only.
5. Development time is constrained by the project timeline given within the class.

## 2.5 Assumptions & Dependencies

1. Assumes the end user's system has a compatible Java Runtime Environment installed.
2. Assumes access to the NWL or CSW word list resource packaged with the application and is accessible at runtime.
3. Assumes a standard desktop operating environment capable of running Java applications.