Software Requirements Specification

for

Hindi Scrabble

Version 1.0.0 approved

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1. Introduction

1.1 Purpose

The existing document is the Software Requirements Specification for the game Scrabble and specifically for version 1.0. It is an open source software. The purpose of this document is to present a detailed description of the game Scrabble. It will explain the purpose and features of the game and the interface of the game.

1.2 Document Conventions

The format specified by IEEE was followed while creating this document. Fonts were 'Arial' and size '11'. The headings of each topic are in bold. Bullet points are used wherever required.

1.3 Intended Audience and Reading Suggestions

This document is intended for these users:

- **Programmers**: In order to have a better understanding of the functions and the potential of that game, so as that any changes or additions for the improvement of the game could be easier.
- **Testers**: For the easier errors check. This software requirements specification can be used as a guide for the bug search, as it significantly helps the organizational part.
- **Typical Users**: Those who are interested in playing the game and wish to know about the functions of the game, as well as the differences it has compared to the well-known board game**.**

1.4 Product Scope

The requirements specified in this document will be used for designing all the aspects and components of the game. The document will be updated as the requirements grow and change over the design and development process.

2. Overall Description

2.1 Product Perspective

The software is an implementation of the Scrabble board game in Hindi. There are multiple online word games which include online scrabble as well. However, very few of these games are in Indian languages. Our software aims to tackle the complexities of the Hindi language through this

interactive word game. This project provides a program which must be installed to play the game Hindi Scrabble.

2.2 Product Features

Main Menu

- Resume game
- Vs CPU
- Vs Player
- High Score
- Options
- Exit

Game

- Game score
- Resume and exit game
- Scrabble board
- Player's rack
- Options: Exchange; Dictionary; Recall; Skip; Play; Resign.

2.3 User Classes and Characteristics

The typical users of this software are children who are interested to play the game Scrabble in Hindi. The game is basically an educational one which serves the purpose of strengthening the user's grip over the language.

2.4 Operating Environment

Scrabble Hindi will run in multiple operating systems like Windows (32 and 64 bit), Linux and MacOS.

2.5 Design and Implementation Constraints

Scrabble Hindi will be developed under the GNU- GPL license. Also anyone is free to share and change the code as it is an Open Source Project.

3. External Interface Requirements

3.1 User Interfaces

The Graphical User Interface will be created in Unity itself by using images as sprites. In this section, the main components of the interface will be described. There will be a main menu that will contain the following functions:

- Resume game – Resumes the last played game (if not complete)
- Vs CPU – New game against Computer
- Vs Player – A multiplayer game will start. At max 4 players can play at a time
- High Score – Top 5 scores ever scored will be displayed
- Options – Another menu will pop which contains buttons of these functions:
    - Sound
    - Music
    - Language
    - Help
    - About
    - Credits
    - Back
- Exit – Exits the game

Below there is the main part which describes the current game.

- At the top the scores of all the players will be displayed
- At top Right an options button will be displayed that contains a menu with the following functions:
    - Resume Game
    - Exit Game
- Below that the board will be displayed on which the game will be played.
- Below that the blocks of letters that player (who has current turn) currently has will be displayed.
- Below that some options that help's player in playing the game will be mentioned:
    - Exchange
    - Dictionary
    - Recall
    - Skip
    - Play
    - Resign

3.2 Hardware Interfaces

A typical Personal Computer with the basic peripherals (Screen, Keyboard and Mouse) is needed to run and have full control of the interface. In general, the hardware requirements are low. Less than 100 MegaBytes of free space will be needing on the computer's hard drive. The monitor is recommended to be able to show resolution of 800x600 pixels. A modem/ router to have a connection to the Internet is not needed.

3.3 Software Interfaces

This system as we mentioned previously can operate in Windows (32/64 bit), Linux and MacOS. The main component which connects with the system is the dictionaries. Without a dictionary you cannot start a new game, as they contain all the words one can import in the board during a game. Dictionaries can be downloaded by choice of the user. Also, the system connects with the Scrabble Save games, the files which save the progress of a game and give the option to the users to continue it at any time they wish.

3.4 Communications Interfaces

The software will be able run without an Internet Connection. However, users can neither download new dictionaries nor connect to a game server to play.

4. System Features

This section will describe in detail all the features in the previous section. The purpose is to allow users to understand, test and expand the program. All the buttons of Resume game, Vs CPU, Vs Player, High score, options, exit are described below to allow the user to get a grasp of the game and be able to optimally enjoy it.

4.1 Resume Game

This allows the user to continue the game from the last point he left. However, when a game is left and continued later then the score is not a valid for high score. This is because each player turn is timed and the word has to be made in a certain time. Thus leaving the game and then constructing the word is not an eligible entry as it beats the purpose of timing the game. In case the user wants the high score to be valid then the program will take away all his tiles and randomly give him new ones and thus nullify the advantage he might have got by copying the numbers. This ensures that a high score is valid and legitimate irrespective of the interruption in the gameplay.

4.2 VS CPU

This game mode basically pits a user against AI of the program. There are levels of AI based on the words they can access from the dictionary database. So a low level of AI can access only the short and easy words but a higher (tougher) AI can access longer and complex words to provide better competition to the user.

4.3 VS PLAYER

This button opens a new game against human players. The game can accommodate a maximum of 4 players against each other. Each player is allotted equal time in which he/she has to come up with a grammatically correct word. In a matchup against human players there is an option to "check word". This allows any player to challenge a word submitted by another player. Here the dictionary database is searched and in the player who has a correct claim gets the points and the player with the wrong word gets null score. In case a player is not able to come up with a word in the given time he is awarded null score. He can now either change his rack of tiles or continue with the same set of tiles. At the end of the game (when all tiles are exhausted) the player with maximum score wins. In case of a tie, the player with minimum time taken wins.

4.4 High Score

This button displays the top 5 highest scores ever since the installation of the game. The scores are listed along with the time of their creation.

4.5 Options

- **Sound -** Here the user has the option to mute the game sounds or change the volume of the game.
- **Music -** User can opt between various sound templates that will be made available in the game.
- **Language -** This changes the language of the buttons in the game. It does not change the script of the tiles, just the text which is in the menus changes.
- **Help -** This changes the language of the buttons in the game. It does not change the script of the tiles, just the text which is in the menus changes.
- **About -** This opens the rulebook of scrabble as implemented in the program. The various intricacies of the board game are explained in detail to ensure that the user can play the game to get the most out of it. As an educational game this is very important because the vision behind the game is not a competitive scenario but rather an environment that promotes learning of Hindi as a language in an engrossing and interesting way.
- **Credits -** This displays the page that gives credits to the developers of the game and the resources used to develop the game.
- **Back -** A button to get out of the options menu and resume the game.
- **Exit -** This exits the game and saves the progress in case a game is still on. Also the points regarding high score (mentioned in resume game) are taken care of.

4.6 Board

The game will be displayed on a checkerboard type grid with 225 squares(tiles). The squares are marked with colors and alphabet codes that denote the point distribution of that tile.

The codes are:
DL - Double letter
TL - Triple letter
DW - Double word
TW - Triple word

The central tile is a double word tile.

4.7 Game Play Menu

There will be options that ensure the smooth gameplay. They are:

- **Exchange** - In case a user can't think of a word then he has the option to submit all his tiles and totally replenish his tile rack. This ends his turn and his score is zero as he didn't place any word.
- **Dictionary -** This opens the dictionary of the game. One can add new words in this part. A new word once added is then validated for all future games and regular point distribution is followed. One can also remove words from the database to get rid of obsolete words or slang that is not a part of the game.
- **Recall -** The game allows the user to place tiles on the board and then confirm it by "play" button. After placing the tiles there are two choices: recall or play. In case the player hits recall then his tiles are brought back to the rack and he can rearrange them to make a new word. The timer will run continuously till the play button is hit.
- **Skip -** This move allows the user to skip his turn. He doesn't play any tiles and neither does he exchange his tiles. This option is useful if a user has high scoring tiles but can't think of a word in the allotted time but is confident that he will come up with a word in the next turn.

- **Play -** This is the fundamental move of the game. It confirms the turn and passes the control to the next player (AI in the case of VS CPU). Once clicked then the move is not reversible and the score is added to the final score.
- **Resign -** This option removes the user from the game and deletes his tiles from the game thus the user takes away his rack when he exits the game. His score is made zero and is ineligible for the high score list.

5. Other Nonfunctional Requirements

5.1 Performance Requirements

The program will not require high graphics card and other specification. The response of game will be less than one second. There will be some exceptions of course, such as the loading of the default dictionary when the program starts which lasts more than one second. Also, the response of the computer as a player will be instant and users shall not wait much time until their turn begins. The setup file size will also be small so it will require less memory.

5.2 Safety Requirements

There is no danger in the system of the user when this application is running.

5.3 Security Requirements

There are no security issues. Anyone can play the game who has this game installed in their device. It is open to all.

5.4 Software Quality Attributes

The software is not ready yet This software will be free. The software, when it will be ready, can be downloaded from: https://gitlab.com/mudit313/Team11cs243. It is available for many operating systems. The license of that program, as mentioned before, is the **GNU-GPL (General Public License).**

5.5 Nationalization Requirements

For the menu you can choose from 3 different regional languages that covers the needs of a wide range of people in the country. It can be ascertained that Scrabble is easier and more entertaining if users operate it in their mother language. With the help of translators, it can be extended to support more languages.

Appendix A: Glossary

- **GNU-GPL**: GNU General Public License is a widely used free software license which guarantees end users the freedom to run, study, share and modify their software. For further information, visit the link: http://www.gnu.org/licenses/gpl-3.0.en.html
- **Player's rack**: The blocks of letters which are available for the player in turn to use.

- **AI**: Artificial Intelligence that is used to train the CPU to play against user.
- **Unity**: It is a game engine that is used to create 2D and 3D games.

Appendix B: To Be Determined List

- **References –** Our game is in developing process. We have not used any references till date but might be using them in future.
- **User Documentation –** This will be written on completion of our game.
- **Network features –** We have not decided right now to include network features or not. But we might include them in future.
- **Communication Interfaces –** This will also be decided later.