# Software Engineering Group Project
## Test Specification

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|---|---|
| *Author:* | Aleksandra Madej - alm82, |
| | Agata Lefek - agl6 |

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|---|---|
| *Config. Ref.:* | GP01-TS-TS |
| *Date:* | 2018-02-21 |
| *Version:* | 1.0 |
| *Status:* | Release |

Department of Computer Science,
Aberystwyth University,
Aberystwyth,
Ceredigion, SY23 3DB,
U.K.

# CONTENTS

# 1   INTRODUCTION

## 1.1   Purpose of this Document

Specify the details of each of the system tests to be executed as part of a formal test process.

## 1.2   Scope

This document covers the system tests and references the the functional requirements as stated in the Game Requirments[1].

The document should be read by the developers working on implementing the system and the testers.

## 1.3   Objectives

This Document aims to:

- Define the system tests upon which we will design our code.

# 2   TESTS

## 2.1   FR1 Start up conditions

| Test Ref | Req Tested | Test Content | Input | Output | Pass Criteria |
|---|---|---|---|---|---|
| 001 | FR1 | Check that appropriate start screen is displayed when starting the game. | Start software. | Start screen containing options of starting new game or loading saved grid is displayed. In the bottom bar there is a home button, high score button, settings button and help button displayed. | Start screen is displayed correctly. |
| 002 | FR1 | Check that High Scores button from bottom bar of Start screen is going to the High Scores screen. | Start software and chose High Score button from bottom bar. | Screen with High Scores is displayed for all cubes with, Names, Score and Date/Time. | High scores screen is displayed correctly. |
| 003 | FR1 | Check that appropriate Setting screen is displayed after choosing Settings from bottom bar of Start screen. | Start software and chose Settings button from bottom bar. | Settings window is displayed containing -Enable Colour Blind Mode, -Enable Music, -Enable Sound Effects, Master volume (SLIDER?) and Clear High Scores button. | Settings screen is displayed correctly. |

| 004 | FR1 | Check that appropriate Help screen is displayed after choosing Help from bottom bar of Start screen. | Start software and chose Help button from bottom bar. | Help window is displayed containing informations about a game. | Help screen is displayed correctly. |
|---|---|---|---|---|---|
| 005 | FR1 | Check that appropriate Home screen is displayed after choosing Home from bottom bar of Start screen. | Start software and chose any of the buttons from bottom bar and then chose home button, to go back to the Start screen. | Returned to the start screen. | Home button is work correctly and displays Start screen. |
| 006 | FR1 | Check that game is asking user for a name after choosing new game option. | Choose new game option. | Window with name box is displayed. | The game is asking user for a name at the beginning of the game. |
| 007 | FR1 | Check that game is asking user for a name after choosing load cube option. | Choose load cube option. | Window with name box is displayed. | The game is asking user for a name at the beginning of the game. |
| 008 | FR1 | Entering blank players name. | Choose blank name. | Blank player name is illegal. | Player name is rejected. |
| 009 | FR1 | Entering the players name with illegal characters. | Choose player name: agl* | Player is told that name contains illegal characters. | Player name is rejected. |
| 010 | FR1 | Entering to long players name. | Choose player name which contains more than 20 characters. | Player is told that name is too long, limit of the characters is 20. | Player name is rejected. |
| 011 | FR1 | Entering to short players name. | Choose player name with less than 2 characters. | Player is told that name is to short, there must be more than 0 characters. | Player name is rejected. |
| 012 | FR1 | Check that appropriate load screen is displayed when loading the game. | Start software. | Load Grid screen containing options of load from file option and Start Game (after you pick one from Recent Grids) In the bottom bar there is a home button, high score button, settings button and help button displayed. | Load Grid screen is displayed correctly. |
| 013 | FR1 | Loading is not allowed if there are no saved grids. | Choose load grid option with no previously saved grids. | Load Grid screen is displayed, and Recent Grids table is empty. | There is no game to start. |

| 014 | FR1 | Loading from a file is not allowed if there is no file to load. | Choose Load From File option with empty file folder. | There is no output | There is no file to load. |
|---|---|---|---|---|---|
| 015 | FR1 | Check that all saved grids are displayed for user to choose from. | Choose load past grid option with some previously saved grids. | List of saved grids is displayed. | All saved grids are displayed on the list. |
| 016 | FR1 | Check that all saved grids are displayed for user and can be selected to play. | Choose Load Grid option with some previously saved grids then choose one of the previous grid and press Start Game option. | Window with name box is displayed and the game is started. | Previous games are available to play. |
| 017 | FR1 | Check that all saved files can be displayed and selected to play. | Choose Load Grid option with some previously saved files and choose Load From File. | Window with files is displayed so user can choose one of them to play. | Saved files are available to play. |
| 018 | FR1 | Check that appropriate screen is displayed while playing a game. | Start a new game or load previous game. | Screen containing grid with tree options of view (3D, 2.5D, 2D), box to Submit Word, words found box and in the top bar there is a point counter, time counter and a settings button, help button and quit button is displayed. | Screen is displayed correctly. |
| 019 | FR1 | Check that appropriate settings screen is displayed when pressed Settings during the game. | Start a new game or load previous game. During the game press Settings from top bar. | Settings window is displayed containing -Enable Colour Blind Mode, -Enable Music, -Enable Sound Effects, Master volume (SLIDER?) and Clear High Scores button. | Settings button is work correctly and Setting screen is displayed correctly. |
| 020 | FR1 | Check that appropriate help screen is displayed when pressed Help during the game. | Start a new game or load previous game. During the game press Help from top bar. | Help window is displayed containing informations about a game. | Help button is work correctly and help screen is displayed correctly. |
| 021 | FR1 | Check if the Quit button ends the game. | During the game press Quit from top bar. | Game is finished and there is start window displayed. | Quit button is work correctly. |

| 022 | FR1 | Check that appropriate quit screen is displayed when pressed Quit during the game. | Start a new game or load previous game. During the game press Quit from top bar. | Quit window is displayed containing earned scores, Best scores, View Highscores button and bottom bar with Home button, Reply button and Save button. | Quit button is work correctly and Quit screen is displayed correctly. |

## 2.2 FR2 Generating new grid

| Test Ref | Req Tested | Test Content | Input | Output | Pass Criteria |
|---|---|---|---|---|---|
| 023 | FR2 | Letters are generated randomly. | Start new game 3 times. | Grid is generated randomly 3 times. | Generated grids are not identical. |
| 024 | FR2 | There are no more occurrences of each letter than allowed population. | Create new grid and count occurrences of each letter. | List of letters and corresponding number of occurrences. | Each letter is used less or as many times as allowed. |

## 2.3 FR3 Loading a past grid

| Test Ref | Req Tested | Test Content | Input | Output | Pass Criteria |
|---|---|---|---|---|---|
| 025 | FR3 | Previous scores and names of players are displayed while playing loaded grid. | Choose a past grid from the list and load it. | Names of previous players are displayed with matching scores. | Names are displayed against correct score. |
| 026 | FR3 | Check the previous grid has been loaded. | Choose a past grid from the list and load it, do it at least twice (choosing the same past grid) | Chosen grid is the same in both attempts. | Past grids are displayed correctly. |

## 2.4 FR4 Timing a game

| Test Ref | Req Tested | Test Content | Input | Output | Pass Criteria |
|---|---|---|---|---|---|
| 027 | FR4 | Clock starts as soon as grid is displayed. | Start a game. | Clock displays time of the game left. | Clock displays 3 minutes when game is started. |
| 028 | FR4 | Clock is updated as the time is passing. | Start a game and wait 10 seconds. | Time displayed on clock is decreasing as time is passing. | Displayed time is updated at least every second. |
| 029 | FR4 | Game stops after 3 minutes. | Start a game and wait 3 minutes. | User is no longer able to create new words after 3 minutes. | Game stops correctly. |

| Test Ref | Req Tested | Test Content | Input | Output | Pass Criteria |
|---|---|---|---|---|---|
| 030 | FR4 | Score of the player is noted when game is finished. | Finish the game. | Final score is displayed after 3 minutes from starting the game. | Correct score is displayed. |

## 2.5 FR5 Actions on game completion

| Test Ref | Req Tested | Test Content | Input | Output | Pass Criteria |
|---|---|---|---|---|---|
| 031 | FR5 | Score is saved if it is one of highest ever achieved. | Empty high-score table. Finish the game with score greater than 0. | Score is highest score ever achieved. | Score is saved in high-score table. |
| 032 | FR5 | Check that end game screen is displayed correctly. | Finish the game. | End screen with options of starting new game, loading past grid or saving current game is displayed. | End screen contains all required elements. |
| 033 | FR5 | Scores in high-score table are ordered correctly. | Add high-score table with different values. Achieve a score between highest and lowest in the table. | New score is added to the table between all higher and lower scores. All lower scores are moved one position down. | Scores are in correct order from highest to lowest. |

## 2.6 FR6 Saving a grid

| Test Ref | Req Tested | Test Content | Input | Output | Pass Criteria |
|---|---|---|---|---|---|
| 034 | FR6 | User is prompted for filename when saving new game. | Finish new game and save it. | Message asking for filename and input box are displayed. | User is able to type in filename. |
| 035 | FR6 | Check that game is saved in correct file. | Finish new game and save it. | Game data is stored in file specified by user. | New file with game data is created. |
| 036 | FR6 | Check that game is saved in correct file. | Finish loaded game and save it. | Game data is stored in file that it was loaded from. | Data is added to old file. No new file is created. |
| 037 | FR6 | Filename for saving the grid has to consist of at least one non whitespace character. | Try saving newly generated grid with name *space* | Filename is rejected. Player is asked to choose different filename. | File has not been created. |
| 038 | FR6 | Filename for saving the grid can consist of maximum 20 characters. | Try saving newly generated grit with name Test Grid With Very Long Name. | Filename is rejected. Player is asked to choose different filename. | File has not been created. |

| 039 | FR6 | Filename for saving the grid cannot contain any special characters. | Try saving newly generated grid with name Grid | Filename is rejected. Player is asked to choose different file-name. | File has not been created. |
| 040 | FR6 | Scores for a grid are ordered from highest to lowest. | Load a grid, finish the game and save it. | Player name and score are saved between all higher and all lower scores in this grid file. | Scores are in correct order. |

## 2.7   FR7 Displaying the grid

| Test Ref | Req Tested | Test Content | Input | Output | Pass Criteria |
|---|---|---|---|---|---|
| 041 | FR7 | Check that 27 letters are generated when starting new grid. | Start a new game. | Cube contains of 27 blocks filled with one letter each. | There are no empty blocks or blocks containing more than one letter. *Exception* : *Qu* |
| 042 | FR7 | Check that letters are displayed as 3 groups of 9 letters. | Start a new game. | Cube is represented by 3 planes consisting of 9 blocks each. Each block represents one letter. | Letters are grouped correctly. |
| 043 | FR7 | Player can change the view as if the cube was seen from any of its faces. | Start a game. Change the view to each face. | The cube view has been changed by the user. | View of the cube is displayed correctly, user can manipulate it. |

## 2.8   FR8 Enabling the user to enter words

| Test Ref | Req Tested | Test Content | Input | Output | Pass Criteria |
|---|---|---|---|---|---|
| 044 | FR8 | Words can be selected with mouse. | Choose one letter with a mouse. | Letter is displayed in word creation window. | Selection is working properly. |
| 045 | FR8 | Any block that has not been used yet can be chosen as first letter of a new word. | Start new game. Choose one letter and undo ?. Repeat with all other letters. | Each of the letters appear in word creation window when selected. | There is no letter that cannot be selected. |
| 046 | FR8 | After first letter is selected only letter adjacent to last selected letter can be chosen. | Choose starting letter. Then choose letter that is adjacent to it. | Both letters are selected (letters that can be selected next are indicated) and displayed in word creation window. | User is able to choose adjacent letter. |

| 047 | FR8 | After first letter is selected only letter adjacent to last selected letter can be chosen. | Choose starting letter. Then choose letter that is not adjacent to it. | Only starting letter is displayed in word creation window. Block with second letter is not available for selection. | User is not able to choose letter that is not adjacent to previous letter. |
|-----|-----|---|---|---|---|
| 048 | FR8 | After submitting a word creation of new word starts. | Start a new game. Create a word and submit. | Word creation window is cleared. Next letter is a starting letter of a new word. | All letters that were used in creation of previous word are marked as available again. |
| 049 | FR8 | After choosing a letter all adjacent letters are marked as available for selection. | Choose first letter in first plane. | The only available letters are: First plane: 2nd letter in 1st row, 1st and 2nd letter in 2nd row Second Plane: 1st and 2nd letter in both 1st and 2nd row Third plane: none | Letters are marked as selectable correctly in all planes. |
| 050 | FR8 | Letters cannot be reused. | Create a word. Choose a block that has already been used. | Block is not available for selection. | Letter cannot be selected. |
| 051 | FR8 | Words are recognized as legal or illegal correctly. | Create a word existing in used dictionary. | Word is accepted (marked on green) and added to Words Found table. Score for it is calculated and added to the total score. | Word is accepted and given associated score. |
| 052 | FR8 | Words are recognized as legal or illegal correctly. | Create a word that does not exist in used dictionary. | Word is not accepted. | Word is rejected - word box is marked on red. |

## 2.9   FR9 Legal words

| Test Ref | Req Tested | Test Content | Input | Output | Pass Criteria |
|-----|-----|---|---|---|---|
| 053 | FR9 | The same word cannot be selected twice. | Create a word that has already been created. | Word box is marked on red. | Word is rejected. |
| 054 | FR9 | Words have to consist of at least one letter. | Choose no letter in the word box. | Word box is marked on red. | Word is rejected. |

## 2.10   FR10 Scoring words

| Test Ref | Req Tested | Test Content | Input | Output | Pass Criteria |
|-----|-----|---|---|---|---|

| 055 | FR10 | Check that every legal word compatible with the dictionary are added to Words Found during the game. | Create a legal word. | Word is accepted and added to Words Found | Every accepted word of user choice is recorded in Words Found table. |
|-----|------|------|------|------|------|
| 056 | FR10 | Check that game score for each letter is calculated correctly. | Create a legal word. | Score for the word is calculated. | Score for the word is square of Scrabble score of the word. |

## 2.11 FR11 Scoring the game

| Test Ref | Req Tested | Test Content | Input | Output | Pass Criteria |
|----------|------------|--------------|-------|--------|---------------|
| 057 | FR11 | Check that final game score is calculated correctly. | Finish game creating more than one word. | Total score is displayed on the end screen. | Total score is sum of scores for each word. |

**REFERENCES**

[1] *Software Engineering Group Projects* JoggleCube Game Requirements Specification. C. J. Price SE.QA.CSRS. 1.0 Release.

[2] *Software Engineering Group Projects* Test Procedure Standards. C. J. Price SE.QA.06 2.0 Release.

## DOCUMENT HISTORY

| Version | CCF No. | Date | Changes made to Document | Changed by |
|---------|---------|------------|--------------------------------|------------|
| 0.1 | N/A | 2018-02-19 | Initial creation | NAW21 |
| 1.0 | N/A | 2018-02-21 | Adding entries to the test table | ALM82 |