

Requirements for Bejeweled

TI2206 Software Engineering Methods

Group 25

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11 september 2015

INTRODUCTION

This document describes the requirements for an implementation of the game Bejeweled. The requirements are split into functional and non-functional requirements. Within the functional category, the different requirements are split according to the MoSCoW method ¹.

1. FUNCTIONAL REQUIREMENTS

1.1. MUST-HAVE

1. Game field

- (a) The game's board shall consist of an 8 by 8 grid which is shown to the player.
- (b) The game's board shall be filled with random jewels before the new game starts.

2. Mechanics

- (a) The game shall clear out jewels, if three or more jewels of the same type are adjacent to another (not diagonally).
- (b) The game shall fill emptied slots on the grid by moving all jewels above the slot downwards.
- (c) The game shall fill empty slots at the top of the board with new random jewels.

3. Moves

- (a) The player shall be able to select two adjacent (horizontal or vertical) jewels to swap.
- (b) The game shall execute a swap if and only if this will create a line of three or more adjacent jewels of the same type.
- (c) The game detects when there are no moves left and ends the game if this is the case.

1.2. SHOULD-HAVE

- 1. The game shall have a menu at all times from where the player can choose to see the high scores, play each game mode, show a hint, end the game or quit.

2. Buttons

- (a) The game shall have a button for hints, new game, quit game and high score for all game modes and additionally pause for time-mode games.
- (b) The game shall hint at the next possible move if the player has not reacted for more than 1 minute or presses a "Hint" button.
- (c) The player can press a "New game" button to end his current game and start a new game.
- (d) The player can press a "Quit game" button to end and exit the game at any time.
- (e) The player can press a "High Score" button to pause the game and show the list of 10 highest scores for all modes.
- (f) The player can press a "Pause" button to pause a time-mode game.

3. Score

¹https://en.wikipedia.org/wiki/MoSCoW_method

- (a) The game shall keep track of and display the score of the player.
- (b) The score is initially zero.
- (c) The game shall add respective points for combinations as listed underneath.
 - i. 3 jewel combination - 50 points
 - ii. 4 jewel combination - 100 points
 - iii. 5 jewel combination - 500 points
 - iv. Simultaneous combinations - Base combination points + 50 bonus point for each additional simultaneous combinations.
 - v. Cascades(Falling jewels line up automatically) - 50 bonus points per Jewel.
- (d) The game shall keep track of the 10 highest scores of games previously played, by storing the score and a associated name for each game mode.
- (e) The game shall prompt for the name of the player and add it to the high score list if the score at the end of the game is higher than the last place in the list.
- (f) The game shall display the high score list at the end of each game.
- (g) The game shall offer to play again at the end of the game.
- (h) The player shall pay certain amount of points when asking for a hint via the hint button.

4. Game modes

- (a) The game shall have different game modes, consisting of classic and timed mode.
- (b) The player shall be able to select the game mode before the start of the game.
- (c) The game shall have a high score list for each game mode based on score at the end of the game.
- (d) The game's classic mode shall consist of only the rules specified in the must-have section.

5. Timed game mode

- (a) In timed game mode, the game shall have an additional timer.
- (b) In timed game mode, the game's timer shall be initialized at 60 seconds.
- (c) In timed game mode, the game's timer shall count down in real-time.
- (d) In timed game mode, the game shall add $2 * n$ seconds to the timer if n jewels are cleared out.
- (e) In timed game mode, the game shall be finished when the timer reaches 0.

6. Sound Effects

- (a) The game shall play a distinct sound when a player makes a valid move.
- (b) The game shall play a distinct sound when a player makes an invalid move.
- (c) The game shall play a distinct sound when there are no moves left.
- (d) The game shall play a distinct sound when the game starts.
- (e) The game shall play a distinct sound when the player quits the game.

1.3. COULD-HAVE

1. The player shall be able to save the current grid and score, and reload this state at a later time.
2. The game shall display text messages after valid moves to encourage the player.
3. In timed mode, the player shall be able to pause the game while in progress.
4. In timed mode, when the game is paused, the player can resume the game.
5. The game shall have keyboard shortcuts for the available buttons.
6. **Special Jewels**
 - (a) The game shall add a 'flame jewel' when 4 jewel combination is made. Detonating this jewel earns 50 points for making the match, 20 points for detonation, and 20 points per jewel destroyed (including the Flame Jewel).
 - (b) The game shall add a 'Hyper jewel' when 5 jewel combination is made. Detonating this jewel earns 50 points for detonation and 50 points per jewel destroyed (including the Hyper Jewel).

1.4. WOULD-HAVE

1. **Sound**
 - (a) The game shall play music in the background.
 - (b) The player shall be able to turn the music and sounds of the game on or off.
2. **Levels**
 - (a) The game shall use '*base points *x*' points for possible combinations in level *x*.
 - (b) The game shall proceed to the next level when the minimum score for the next level is reached, calculated by $5000 * (x+1)$ with *x* being the current level.
 - (c) The game shall discard the grid when the player reaches the next level and generated a new random grid.
3. **Statistics**
 - (a) The game shall display statistics of the last game (alongside the high scores) when the game ends.
 - (b) The statistics shall consist of the separate amount of combinations of 3, 4 and 5 jewels made during the game.
4. **Zen game mode**
 - (a) The game shall generate new jewels such that the player can always make a next move (the game never ends).

2. NON-FUNCTIONAL REQUIREMENTS

1. The game shall be playable on Windows (7 or higher), Mac OS X (10.8 and higher), and Linux (Ubuntu 14.04 and higher).
2. The game shall be implemented in Java 8.
3. A first working version of the game shall be finished no later than Friday, 11 September.

4. The code quality shall be verified using static analysis tools via the Maven framework.
5. The functionality of the code shall be verified using test cases.
6. The game shall be developed in an agile way, using (parts of) the SCRUM methodology.