

Space Invaders : Requirements

Group 22

TI2206 Software Engineering Methods

Ege de Bruin
Bryan van Wijk
Martijn van Meerten
Dorian de Koning
Jochem Lugtenburg

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Supervisor: Dr. A. Bacchelli
TA: Danny Plenge

Delft University of Technology
Faculty of EEMCS

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1 Functional Requirements

A list of functional requirements which were considered during the planning of the project. Functional requirements describe services or functions a system should deliver to the end user. The requirements are listed using the MoSCoW method. The MoSCoW method is a widely used standard in the industry and involves prioritized requirements. The requirements are categorized in four categories, 'Must', 'Should', 'Could' and 'Would/Won't'. If a 'Must' is not included in the final deliverable, the project is not considered a success.

1.1 Must Haves

The Space Invader game must meet the following requirements:

- The game shall start when the player presses a predefined key on the keyboard.
- The game shall load a grid of 10 x 4 enemies in the form of aliens before a new game starts.
- The game shall load a player in the form of a spaceship on the bottom of the screen before a new game starts.
- The player shall have three lives after a new game has started.
- The player shall lose one life when it is hit by an enemy bullet.
- The enemies shall move horizontal in between the borders of the game screen, starting in the middle of the screen, from left to right.
- The enemies shall start with a movement speed of 40 pixels per second.
- The enemies movement direction shall be reversed upon hitting a border of the game screen.
- The enemies shall move 10 pixels downwards upon hitting a border of the game screen.
- The game shall end if the player's lives are depleted.
- The game shall end if the enemies reach the same height as the player.
- The player shall be able to move his/her character on a horizontal axis to the left and right using predefined keys.
- The player shall be able to shoot bullets on a vertical axis towards the top of the screen using a predefined key.
- The enemies shall shoot bullets on a vertical axis towards the bottom of the screen.
- An enemy shall disappear if it is hit by a bullet shot by the player.
- The game shall show the amount of lives on the top right of the screen.

1.2 Should Haves

The Space Invader game should meet the following requirements:

- The player shall be able to restart the game after the game ends.
- The game shall be able to display the overall high score on the screen.
- The enemies shall move 4 pixels per second faster upon hitting the border of the game screen.
- The game shall load 4 barricades between the enemy and the player before a new game starts.
- The barricades shall become damaged after being hit by a bullet.
- The bullet shall disappear after hitting a barricade.
- The player shall be able to pause the game.
- A player shall obtain ten points upon hitting an enemy with a bullet.
- The game shall load with an initial score of zero points.
- The game shall show the total amount of points obtained on the top left of the screen.
- The game shall notify the player on the screen after the game ends.
- The game shall load a new grid of 10 x 4 enemies in the form of aliens if all the aliens are killed.

1.3 Could Haves

The Space Invader game could meet the following requirements:

- The game shall have different levels which can be played by the player.
- The player shall be able to collect power-ups by shooting a red enemy.
- The game shall have a power-up which increases shooting speed for five seconds.
- The game shall have a power-up which increases movement speed for five seconds.
- The game shall play a music track while the game is in progress.
- The game shall have sound effects if a bullet is fired and if a bullet hits an enemy.
- The game shall display an explosion effect after an enemy or player is hit by a bullet.
- The player's movement speed shall increase while moving.
- The player shall bounce back upon hitting the border of the screen.

1.4 Would/Won't Haves

The Space Invader game could meet the following requirements:

- The player shall be able to upgrade its spaceship after a wave of enemies.
- The player shall be able to interact with the game using the mouse.

2 Non-Functional Requirements

A list of non-functional requirements which were considered during the planning of the project. Non-functional requirements are constraints on the system or development process. If the non-functional requirements cannot be met, the system is considered useless.

- The program shall be executable on Windows (7 and higher), Mac OS X (10.8 and higher), and Linux.
- The game shall be implemented using the Java programming language.
- The game shall be implemented using Java version 8.
- The code shall be placed under version control using Git, using a remote repository on GitHub.
- The code shall be compiled using Apache Maven.
- The code shall be analyzed for programming flaws using PMD and FindBugs.
- The code shall be analyzed using Checkstyle before each push to GitHub.
- A first fully working version of the game shall be delivered at September 11, 2015