

Functional Requirements

Must Haves

- The game must include a login screen for the player to log in
- The game must include a registration screen for a new player to sign up
- The game must include authentication to check if the player has an account
- The player must be able to sign up for the game with an account
- The player must be able to log into the game
- The player must be put into a start menu once they have successfully logged in
- The player must be able to start a new game of snake from the start menu
- The player must be able to end the game once they have started
- The board must consist of a grid with a width of n by n cells
- The game's board will have predefined boundaries
- The player's snake shall spawn in a predefined location on the board
- The player's snake will start with a predefined size of 2 cells of length and one cell of width
- The player's snake will continuously move forward unless a player changes its direction, which will cause the snake to move forward in that specified direction
- The player's snake shall be able to change direction using the arrows keys to change the snake's direction
- The game must start with a snack already spawned in a predefined location
- The game shall allow the player to move over the snack and consume it, removing it from the board and incrementing the players score by 1
- The player's snake shall grow in size by 1 cell in length once it goes over an apple within the game
- The game shall spawn a new snack instantaneously after the player consumes it in a random position on the board
- The game shall not spawn a snack if that cell is occupied by the player's model or a boundary
- The game will end in a loss if the player runs into a predefined boundary on the map
- The game will end in a loss if the player's snake runs into itself
- The game will show the player's score once the game has ended
- The game will keep a leaderboard of the top 5 scores that have ever been recorded and show it to the player at the end of the game
- The game will show the player their score at the end of the game

Should Haves

- The player should be able to pause an active game
- The game should display the current duration of the game in the pause menu
- The player should be able to view his current score in the pause menu
- The pause menu should include the option to restart the game, return to start menu, or exit the application
- The game will transfer the user to the start menu once the user has pressed the end game key
- The game shall display the player's current score of eaten apples during an active game
- The game will start with the player's score being 0
- The game shall clear the board once the game has ended
- The game shall show the player's game statistics after ending a game
- The game will present the player with the option of returning to the start menu, exiting the application or restarting the game once the player has lost or won
- The game shall check the credentials the player registered with, to ensure that the password/username meet a number of requirements (such as the password having an appropriate length)
- The game should include a score menu where the player would be able to view the highest scores achieved by other players, and see their own high score
- The player should be able to view their past high score
- The player should be able to view their current position on the high score ladder

Could Haves

- The game could have a music theme while the player is playing
- The game could have sounds when a player runs into themselves or a boundary
- The game could have sounds when a player eats an apple
- The player could be able to turn these sounds on and off
- The game could have a settings menu where they player will be able to modify settings such as music/sound + controls
- The game could allow the player to change the controls of the snake in the settings menu
- The player could be able to change the aesthetic look of their board
- The game could include different boards with varying positions of boundaries and varying sizes
- The player could unlock different skins of snakes

- The game could have an achievement system for the player, where a player could earn ranks based on their highest score
- The game could implement varying types of apples the snakes can eat, with varying effects on the player's snake (speeding up, shortening,)

Won't Haves

- The game could also have email included in the player's login in credentials
- The game should also allow the player to reset the password to their account if they have a confirmed email
- The game could have a friend system with the player being able to add friends
- The game could have a messaging system between the player and his friends
- The game could have a map builder where the player will be able to create their own custom maps
- The player could have an anonymous mode, requiring no login (but no skins etc.)
- The game could have a multiplayer mode, either as two players one PC, or two players two PC's.
- Port to Android

Non-Functional Requirements

- The game will be implemented using Java
- The game will use a SQL & JDBC driver to communicate with a database regarding player's accounts/scores
- The game will use prepared statements in Java to protect against code-injection vulnerabilities
- The game should be playable on Windows, Mac
- The team will use the Scrum methodology for creating the game
- The implementation of the game shall have at least 75% of meaningful line test coverage excluding any unnecessary elements such as the GUI