Use-Case: Start Game

Primary Actor: Player

Goal in context: To start the game

Preconditions: Application must be open

Trigger: Player clicks on the 'Start Game' button

Scenario:

1. Player opens the application
2. A main menu is displayed to the screen, with various GUI elements
3. The player clicks on the 'Start Game' button
4. The first level is initialized *(See Use-Case: Initialize Level)*

Exceptions:

1. Player closes the game
2. Player does not select the start game button.

Priority: High

When available: Second Increment

Frequency of use: Frequent

Use-Case: Initialize Level

Primary Actor: System

Goal in context: To initialize the specified level

Preconditions:

1. The level # must be passed as a parameter
2. Player must have chosen to start game

Trigger: Player enters a number corresponding to a specific level

Scenario:

1. The system loads the layout of the specified level from an external file
2. Create an empty grid to store level components
3. Add level components from loaded level onto the grid
4. Draw the level components each game tick, updating positions of th`e player/enemies *(See Use-case: Update game)*

Exceptions:

1. No level # is provided
2. User chose to go to instruction/rules menu first
3. Level # provided is out of bounds (1-5)

Priority: High

When available: First Increment

Frequency of use: Frequent

Use-Case: Instructions/Rules menu

Primary Actor: Player

Goal in context: To open a menu that informs the player of the game scenario and how to play

Preconditions: The player must be at the home/main menu where a choice between starting the game and opening the instruction/rules menu is available

Trigger: Player selects the instruction/rules button from the main menu

Scenario:

1. Player launches the game

2. Player is greeted at the main menu with two buttons: Start game or Instructions/Rules
3. Player selects Instructions/Rules button
4. The game's description, rules, and overall goal is displayed to the player

Exceptions:

1. Player chose to start the game
2. Player closes game

Priority: Medium
When available: Second increment
Frequency of use: Somewhat frequent

Use-Case: Update game
Primary Actor: System
Goal in context: Update the game state every tick
Preconditions: Level is initialized
Trigger: Called once every game tick
Scenario:

1. Redraw all static grid components
2. Detect keyboard input
3. Update the player's position *(See Use-case: Move Character)*
4. Update moving enemies' position *(See Use-case: Move Enemy)*
5. Update game statistics (Air supply, points, time elapsed, batteries collected, score)

Exceptions:

1. Game is paused *(See Use-case: Pause Game)*

Priority: High
When available: First Increment
Frequency of use: Very Frequent

Use-Case: Move Character
Primary Actor: Player
Goal in context: To move the player's character one unit in one of four directions.
Preconditions: Player character must be instantiated on the grid
Trigger: Player presses one of "WASD" or Arrow Keys.
Scenario:

1. Player Starts the game *(See Use-Case: Start Game)*
2. Player presses a directional key (WASD or Arrow Keys)
3. Depending on which key is pressed, the character moves in one of four directions by one grid unit

Exceptions:

1. Movement direction is blocked by barrier
2. Game is paused and/or not in focus (Another GUI may be open)
3. Key press is not recognized by the system
4. Player tries to move in-between game ticks
5. Player is already moving
6. Player moves into a Black Hole *(See Use-Case: Black Hole)*

Priority: High
When available: First Increment
Frequency of use: Very frequent

Use-Case: Pause/unpause Game

Primary Actor: System

Goal in context: Pause the game when player presses the pause button and unpause upon pressing the same button

Preconditions:

1. Game must be running/Player must be in game

Trigger: Player presses the "escape" key while in game

Scenario:

1. Player is in game and the game is running
2. Player presses the pause button
3. The game stops updating and all aspects of the game are static
4. Player presses the same button and the game resumes updating at each tick

Exceptions: Player is in the main menu, instructions/rules screen, or end screen

Priority: Medium

When available: Second Increment

Frequency of use: Somewhat frequent

Use-Case: Exit to menu

Primary Actor: Player

Goal in context: To return the the main menu screen

Preconditions: The game must be paused

Trigger: The player clicks on the "Menu" button from the pause screen

Scenario:

1. The player pauses the game *(See Use-case: Pause/Unpause Game)*
2. Player selects the "Exit to Main Menu" Option
3. The player is brought to the main menu, skipping the results screen

Exceptions:

1. The player is not in a paused game (Main menu, instructions, results, etc.)

Priority: Medium

When available: Second Increment

Frequency of use: Infrequent

Use-Case: Collect battery

Primary Actor: Player

Goal in context: To collect the mandatory type 1 reward

Preconditions: The game has started

Trigger: The player collides with the reward

Scenario:

1. The player collides with the reward
2. The reward disappears
3. The player's score is updated on the screen

Exceptions:

1. The game is paused

Priority: High

When available: First Increment

Frequency of use: Frequent

Use-Case: Player collects air tank
Primary Actor: Player
Goal in context: Replenish oxygen levels
Preconditions: The game has started
Trigger: Player collides with oxygen tank
Scenario:

1. The player collides with the air tank
2. The air tank disappears
3. Player's oxygen is replenished by 75 points and or their score is multiplied

Exceptions:

1. The player has negative oxygen *(See Use-case: Player loses game)*

Priority: High
When available: First Increment
Frequency of use: Frequent

Use-Case: Player touches Walking Alien
Primary Actor: Player
Goal in context: Stop the game and player loses
Preconditions: Game is started and player is playing a level
Trigger: Player collides with Walking Alien
Scenario:

1. The player collides with the Walking Alien
2. The game stops with all values static
3. See Use-case: *Player loses game*

Exceptions:

1. The player has invulnerability granted from a different collision

Priority: Medium
When available: Second Increment
Frequency of use: Frequent

Use-Case: Player touches Hiding Alien
Primary Actor: Player
Goal in context: Damage the player (Reduce oxygen level)
Preconditions: Game is started and player is playing a level
Trigger: Player collides with hiding alien
Scenario:

1. The player collides with the hiding alien
2. The player's oxygen tank depletes
3. The player gets 1 second of invulnerability

Exceptions:

1. Player has < 0 oxygen after collision *(See Use-case: Player loses game)*
2. The player has invulnerability granted from a different collision

Priority: Medium
When available: Second Increment
Frequency of use: Frequent

Use-Case: Player touches black hole
Primary Actor: Player

Goal in context: Traverse the game grid by skipping multiple tiles
Preconditions: There are 2 blackholes with the same ID
Trigger: The player walks into a cell containing a black hole
Scenario:

1. The player starts the game
2. The player walks into a blackhole from any direction
3. The player is teleported, and exits a different blackhole from the opposite direction

Exceptions:

1. The player walks into a blackhole in a direction such that the other blackhole's exit is blocked by a barrier
2. There are not 2 blackholes with the same ID in the game

Priority: Low
When available: Third Increment
Frequency of use: Infrequent

Use-Case: Player wins
Primary Actor: Player
Goal in context: Winning the game
Preconditions: The player must be in a game (Unpaused)
Trigger: The player touches the end tile, with all type 1 rewards collected
Scenario:

1. The player selects "Start Game"
2. The player navigates the game grid, collecting all type 1 rewards *(See Use-case: Collect battery)*
3. The player navigates to the ending tile
4. End screen is displayed *(See Use-case: Score calculation screen)*

Exceptions:

1. The player runs out of oxygen or collides with walking alien *(See Use-case: Player loses)*
2. The player has not collected all type 1 rewards

Priority: High
When available: First Increment
Frequency of use: Frequent

Use-Case: Player loses
Primary Actor: Player
Goal in context: Losing the game
Preconditions: The player must be in a game
Trigger: The player's air tank dips below 0
Scenario:

1. The player selects "Start Game"
2. The player collides with a moving enemy
3. The player's air tank reaches zero, and the end screen is displayed *(See Use-case: Score calculation screen)*

Exceptions:

1. The game is paused
2. The player is on the exit tile with all batteries collected and acceptable oxygen levels (Above 0)

Priority: High
When available: First Increment
Frequency of use: Frequent

Use-Case: Score calculation screen
Primary Actor: Player
Goal in context: After the game ends, the player will see a different message depending on if they won or lost. After, a scoreboard will appear totaling the player's score
Preconditions:

1. The player has collected all the batteries and touched the exit cell
2. The player has under 0 oxygen in the air tank
3. The player collides with a walking alien

Trigger: The player won or lost the game
Scenario:

1. The player completes either the *Player wins* or *Player loses* use-cases
2. The game stops and a pop up message saying the player won or lost is displayed
3. The players total score is calculated and displayed *(See Use-case: Scoreboard and endscreen display)*

Exceptions:

1. The player has not collected all batteries
2. The player is not on the exit cell
3. The player has adequate oxygen levels
4. The player has not touched a walking alien

Priority: High
When available: Second Increment
Frequency of use: Frequent

Use-Case: Scoreboard and endscreen display
Primary Actor: System
Goal in context: Displays a "high score" chart with corresponding difficulties. (Only the top 3 scores per difficulty level will be displayed. Any higher score will overwrite the old score) The player will then have the option to play again or exit the game
Preconditions: The game has ended, and the player's score has been calculated
Trigger: The player either wins or loses the game *(See Use-cases: Player Wins/Player Loses)*
Scenario:

1. The player either wins or loses the game
2. The player's score is added to the leaderboard if it is high enough
3. A leaderboard/high-score chart is displayed with the player's score and game difficulty

Exceptions:

1. The score calculation screen has not yet been displayed (See the exceptions for Use-case: *Score calculation screen*)

Priority: Low
When available: Third Increment
Frequency of use: Frequent