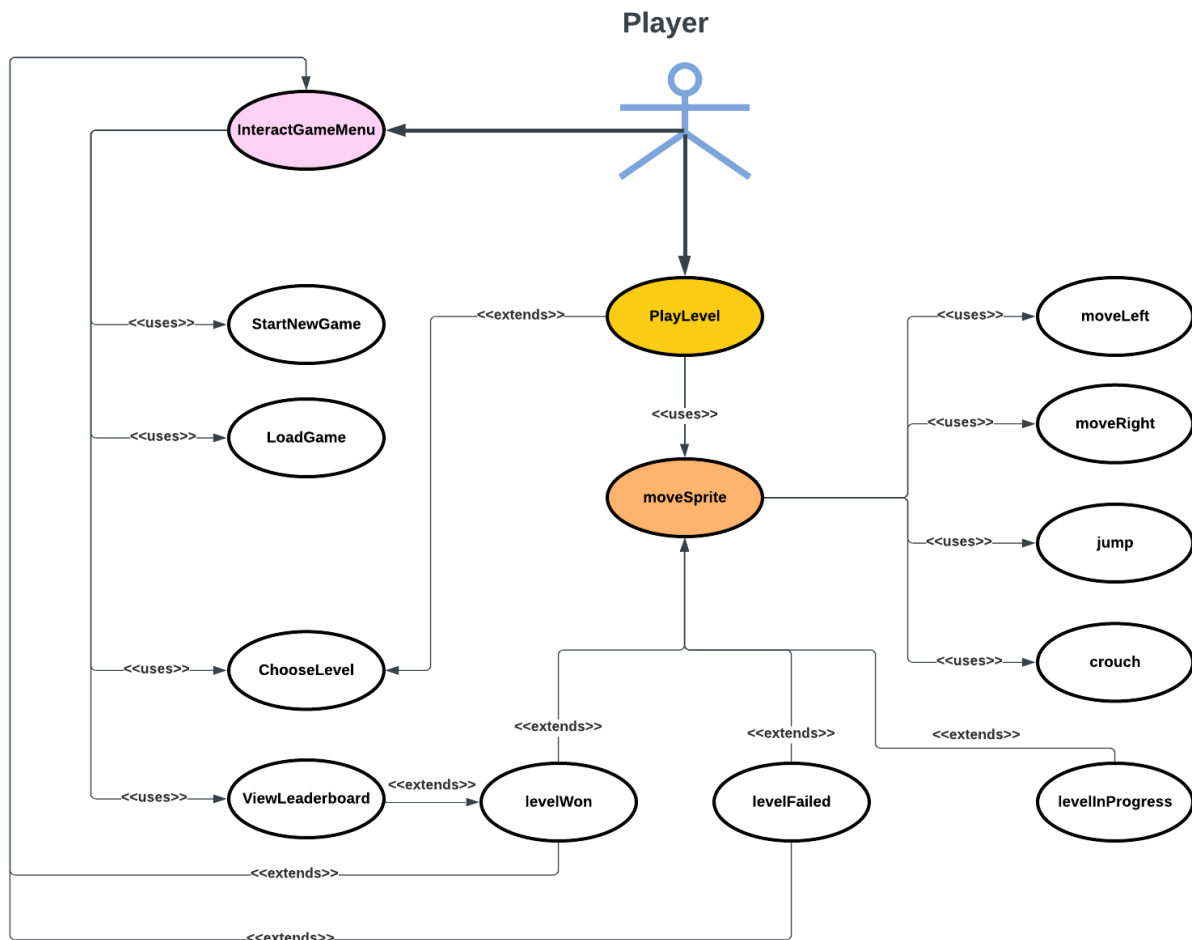


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DATE: March 7, 2024  
TO: Nick Allgood  
FROM: CMSC447-04 Team Himalayans <everest-the-olympicat@googlegroups.com>  
Anna Pham, Connor Gilger, David Middour, Jess Turner, Samuel Oyeneyin  
SUBJECT: Use Case Document

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**Figure 1. Use Case Diagram**

There are two main categories: InteractGameMenu and PlayLevel.  
Once the user chooses a level, they can play it and move their character.  
Eventually, the level is over and the user views a screen with the level's status.  
Then they can go back to the menu if they want!  
Note: we use **user** and **player** synonymously in this document.

## Category: InteractGameMenu

This use case category corresponds to all the things the user can do from the game menu, which is the screen that user sees when they first open our application.

Almost every team member will work on developing this portion of the application, particularly having heavy involvement in the design of this main menu page.

### **Name: StartNewGame**

Goal: Store the user's name so their game run-through is associated with their name.

Use Case Team Leader/Members:	Jess Turner (Frontend)
Pre-condition:	The user is viewing the main menu screen.
Post-condition:	<p>The user will have written their name in the text area and then pressed the submit/next button!</p> <p>The user can interact with the game menu, view the leaderboard, and play game levels.</p>
Constraints/Issues/Risks:	This use case requires that the user successfully loaded the web application and thus has a reliable internet connection for our app to send internal requests.
Trigger Events	The user pressed the menu button corresponding to this use case i.e. "Start New Game".
Primary Actor	Player
Use Case Pathway Names:	<p>validName</p> <ul style="list-style-type: none"><li>- The user enters a valid name in the text area, presses the submit button, and is then brought to the next page of the application (ViewGameMenu)</li></ul> <p>invalidName</p> <ul style="list-style-type: none"><li>- invalidName case 1 (emptyName): The user entered an empty string but pressed the "submit" button.</li></ul>

**Name: LoadGame**

Goal: User information about which levels are completed as well as their scores and times is retrieved from the database.

Use Case Team Leader/Members:	Jess Turner
Pre-condition:	The user has already played the game before. The game automatically saves the user's level progress, they just need to enter the name they started the game with.
Post-condition:	User information about which levels are completed as well as their scores and times is retrieved from the database.
Constraints/Issues/Risks:	This use case requires that the user successfully loaded the web application and thus has a reliable internet connection for our app to send internal requests.
Trigger Events	The user launches the app and enters a name associated with a user in the database
Primary Actor	Player
Use Case Pathway Names:	<p>Primary Path:</p> <ul style="list-style-type: none"><li>- The user enters a name associated with a user in the database and the information on the user is retrieved.</li></ul> <p>Exception Path:</p> <ul style="list-style-type: none"><li>- The user enters a name not in the database, this creates a new user.</li><li>- invalidName (emptyName), the user entered an empty string but pressed the "submit" button.</li></ul>

**Name: ChooseLevel**

Goal: The user enters a game level and begins playing

Use Case Team Leader/Members:	Connor Gilger
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Pre-condition:	The user is viewing the main menu screen. The user selects the "Choose Level" button from the main menu.
Post-condition:	The user is now playing the chosen level.
Constraints/Issues/Risks:	<ul style="list-style-type: none"> <li>- After the user selects the "Choose Level" button, the Main menu is unable to transition to this page.</li> <li>- After the user selects a level number on this ChooseLevel page, the selected level fails to load correctly.</li> </ul>
Trigger Events	The user presses a level number button. If it is not disabled (depending on if they have passed the pre-requisite levels), they will be navigated to the requested level gameplay page!
Primary Actor	Player
Use Case Pathway Names:	<p>Primary Path:</p> <ul style="list-style-type: none"> <li>- The user navigates the main menu to the level select screen and chooses a level. The selected level is then loaded for the user to play.</li> </ul> <p>Exception Path:</p> <ul style="list-style-type: none"> <li>- N/A</li> </ul>

**Name: ViewLeaderboard**

This shows the user the top 10 highest scores and corresponding names. They either see this by choosing this option on the main menu or after a level ends.

**Name: Level Won**

Goal: Display the level success screen.

*Explanation:* When a level has been successfully completed, a screen showing the # of powerups collected, # of obstacles run into, how fast the level was cleared, # of coins collected, and how many special obstacles/special events were triggered will be displayed. The leaderboard is then displayed.

Use Case Team Leader/Members:	Samuel Oyeneyin (Backend)
Pre-condition:	A level has been successfully completed.
Post-condition:	The level success screen is displayed. The user is given the option to view the leaderboard or go back to the main menu.
Constraints/Issues/Risks:	Game crashes, inaccurate scoring
Trigger Event(s):	A level has been successfully completed (see MoveSprite use case primary path)
Primary Actor:	User
Use Case Pathway Names:	<p>Primary Path (Level Won):</p> <ul style="list-style-type: none"><li>- The user has successfully completed a level. The level success screen is displayed.</li></ul> <p>Exception Path:</p> <ul style="list-style-type: none"><li>- Unable to display the level success screen</li></ul>

**Name: Level Failed**

Goal: Display the level failed screen

*Explanation:* When a level has been failed the trigger that caused the failed level (too many hit obstacles, time ran out, fell into abyss, movement stalled) will be displayed.

Underneath this, the # of powerups collected, # of coins collected, # of obstacles run into, how long the player spent in the level, and how many special obstacles/special events were triggered will be displayed.

The user is then given the option to view the leaderboard or go back to the main menu.

Use Case Team Leader/Members:	Anna Pham
Pre-condition:	A level was not successfully completed
Post-condition:	The level fail screen is displayed. The user is given the option to view the leaderboard or go back to the main menu.
Constraints/Issues/Risks:	Game crashes, inaccurate scoring
Trigger Event(s):	A level was not successfully completed (see MoveSprite use case exception path)
Primary Actor:	User
Use Case Pathway Names:	<p>Primary Path (Level Fail):</p> <ul style="list-style-type: none"><li>- The user has failed a level. The level fail screen is displayed.</li></ul> <p>Exception Path:</p> <ul style="list-style-type: none"><li>- Unable to display the level fail screen</li></ul>

## Name: View Leaderboard

Goal: Display the leaderboard

*Explanation:* After level completion/failure, the overall score of the player is updated, The leaderboard rankings/scores are updated and the level's completion will be saved. The player is then redirected to the main menu or given the option to choose the next level (if the level was completed successfully). If the leaderboard is empty, a blank screen will be displayed with the title leaderboard.

Use Case Team Leader/Members:	Samuel Oyeneyin (Frontend) Anna Pham
Pre-condition:	<ul style="list-style-type: none"><li>- The user passed or failed a level or...</li><li>- The user is viewing the game menu and presses the "View Leaderboard" button.</li></ul>
Post-condition:	The leaderboard is displayed
Constraints/Issues/Risks:	There may be no data on the leaderboard if the user has not played passed any levels, inaccurate scoring, game crashes
Trigger Event(s):	<ul style="list-style-type: none"><li>-The user passed or failed a level and chose to view the leaderboard.</li><li>-The user is on the game menu and chooses to view the leaderboard</li></ul>
Primary Actor:	Player
Use Case Pathway Names:	<p>populatedLeaderboard:</p> <ul style="list-style-type: none"><li>- The user is on the game menu and chooses to view the leaderboard. The leaderboard is displayed.</li><li>- The user played a level and either passed or failed it. The leaderboard is displayed after displaying the win or loss.</li></ul> <p>unpopulatedLeaderboard:</p> <ul style="list-style-type: none"><li>- The leaderboard is displayed with no data. The reason is that the Player has not completed any levels yet.</li></ul>





## Category: PlayLevel

### **Name: MoveSprite**

Goal: Move the game character until the level is completed (win/lose).

*Explanation:* The actual level the player will be playing in. Contains the character sprite, background environment (rectangles, sprites, etc.), obstacles, and special events that the player can trigger. The level will move continuously from left to right so the player's movement will be horizontal with the exception of jumps. The score is also being recorded in the play level and will be sent to the leaderboard. Coins will be placed throughout the map for players to collect. If the player gets a better score than what is already present on the leaderboard the player's score will be updated in the leaderboard.

Use Case Team Leaders/Members:	Everyone
Pre-Condition:	The user already selected a level (during the ChooseLevel use case).
Post-Condition:	<ul style="list-style-type: none"><li>a. The level is successfully completed</li><li>b. The level is failed and restarted</li><li>c. Game is ended</li></ul>
Constraints/Issues/Risks:	Assets failing to load Glitches in game physics Softlocking
Trigger Events:	Initiating the level from the menu (ChooseLevel)
Primary Actor:	Player
Pathways:	<p>levelOver:</p> <ul style="list-style-type: none"><li>- If the user reaches the end of the level before time runs out, they will be shown a level complete screen and their score and progress will be recorded to the database.</li><li>- The user will have the option to retry the level, continue to the next level, or quit (which brings them back to the main menu).</li><li>- Movement types:<ul style="list-style-type: none"><li>- Jump</li><li>- Move horizontally</li><li>- Crouch</li></ul></li></ul> <p>HitObstaclePath:</p>

- If the player runs into an obstacle there are two scenarios:
  - Subpath #1: non-fatal obstacle
    - If the player attempts to move through a non-fatal obstacle, they will not be able to.
    - In order to progress, they must move (jump or crouch) around the obstacle
    - Examples:
      - Rocks
      - Trees
  - Subpath #2: fatal obstacle
    - If the player touches a fatal obstacle, the player will “die” and the level failed screen will be displayed.
    - Examples:
      - Spikes
      - Boulders
      - Falling debris
      - Abyss
    - If the player possesses a shield powerup, they can continue to play but will lose the shield, unless they fall into the abyss.

#### QuitLevelPath

- If the user chooses to exit the level using the pause menu, the level is unloaded and the user's progress is not saved.

#### GameCrashPath

- If the level fails to load, the user will be returned to the start screen and an error will be returned.

**Name: PowerUp**

Goal: Player acquires power-up

*Explanation:* The user can collect power-ups throughout the level which will help them navigate the level easier. The power-ups include Speed, Low Gravity, and a Shield. Speed increases the player's horizontal velocity. Low Gravity increases the player's jump height. The shield gives the player an extra hit before dying. Low Gravity and Speed expire after a few seconds. All power-ups expire after the user completes the level or dies.

Use Case Team Leader/Members:	TBD
Pre-Condition:	The level has been loaded and started
Post-Condition:	PowerUp is acquired and runs its course
Constraints/Issues/Risks:	PowerUp not working The user finishes the level while powered up
Trigger Events:	<ul style="list-style-type: none"><li>- The user collects the powerup item by having their sprite touch the powerup icon.</li><li>- If the user is hit and they have a shield, they lose the shield. Otherwise, if they are hit, they take damage.</li></ul>
Primary Actor:	Player
Pathways:	<p>AcquirePowerUp</p> <ul style="list-style-type: none"><li>- GoFaster: player will speed up by 200% for 10 seconds</li><li>- LowGravity: game gravity reduced by 70% for 10 seconds</li><li>- Shield: the player has an extra "hit" in case they touch a fatal obstacle, preventing them from dying.</li><li>- If a player attempts to grab a powerup while a powerup is active, their score will increase but the powerups do not stack.</li></ul> <p>FinishLevel</p> <ul style="list-style-type: none"><li>- If the user finishes a level or dies with an active powerup, the powerup will expire and the user</li></ul>

	will be returned to their default state in the next level.
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