

# Plumbers on ICE

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# Scope 2.0

Plumbers on Ice will create a sprite animation-based, 5-level, 1 to 2-player game for the Android mobile operating system, similar to Super Mario Brothers. Each level will contain various obstacles that the player must maneuver around. Scores will be based on the number of coins gathered, clear time, and number of enemies defeated. The game will have a single and dual player mode, high score on single player for each level plus 2-player match history. The characters will be able to move forward and jump.

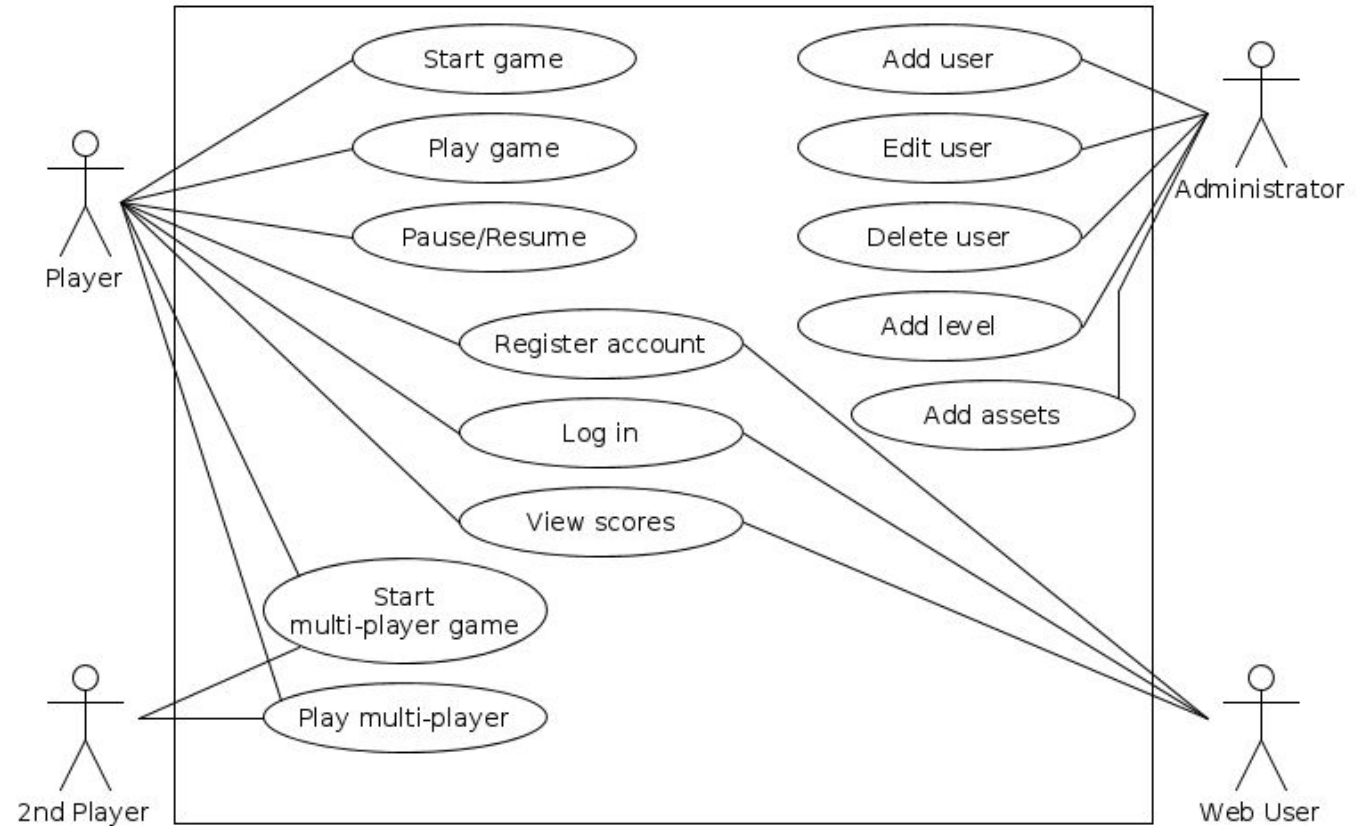
# Scope 2.0

- The game will have single-player and 2-player mode
- The game is a mobile game on Android with 2D graphics
- There will be 5 levels
- The player will be able to move forward and jump, but backwards movement is outside of the scope of the project
- The website will allow users to:
  - Create an account
  - View and modify their account
  - View their best scores
  - View high scores
  - View 2-player match history
- Allowing players to create their own levels is not within the scope of the project

# Requirements

Req#	Requirement	Priority
M10	The model must update context, progress, and have a representation of the state to be persisted (High Scores and Player)	1
S11	Only players that are connected to the internet can compete in multiplayer mode.	1
S12	There can only be a maximum of two players per multiplayer game.	1
S31	In a multiplayer game, each player will be awarded a score that is based on clear time, coins grabbed, and enemies defeated.	1
S32	Only the top 20 scores will be displayed on the site.	1
S41	The administrator must be given the capability to upload new assets that can be used to create and customize content.	1
S42	The administrator must be able to create new levels, as well as customize or delete existing levels.	1
S43	A moderator must be able to ban users threatening other users or posting the personal information.	2
S44	A user can issue a warning to another player before contacting the moderator.	2
S51	The administrator will be able to update the store content via the administration interface.	
ST10	The placement and types of sprites within a level must be stored in JSON or XML format. The paths to these files will be stored in a MySQL DB.	
ST11	Information about the number and usage of sprite animations as seen as a part of a sequence will be stored in JSON or XML format. The paths to these files will be stored in a MySQL DB.	
ST12	The behavior and sequences for sprites within a given level must be stored in JSON or XML format. The paths to these files will be stored in a MySQL DB.	

# Use Cases (review)



# Use Cases

## Use case: Start single-player game

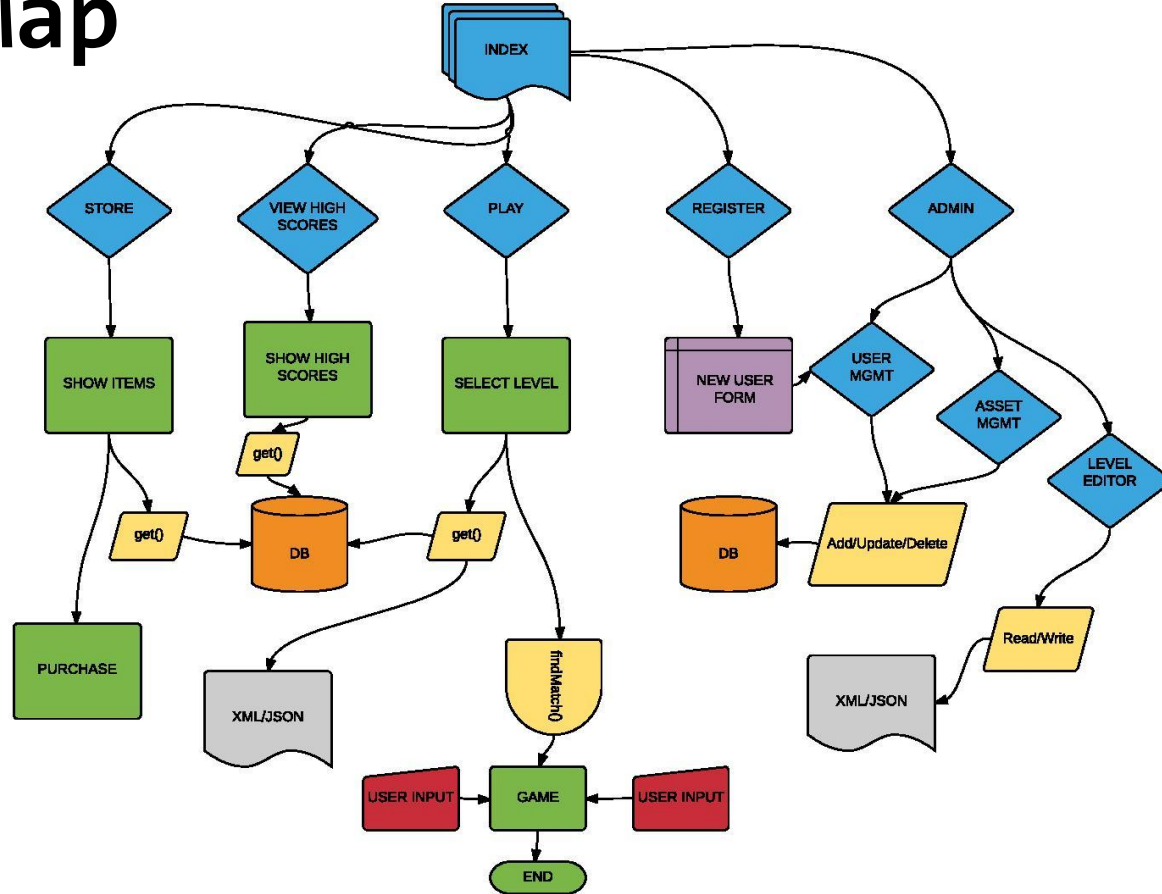
<u>Use Case Name</u>	Start single-player game session
<u>Scope</u>	Plumbers on ICE Game App
<u>Level</u>	User goal
<u>Primary Actors</u>	Player
<u>Stakeholders and Interests</u>	- Player: Wants to begin playing a level in single-player mode
<u>Preconditions</u>	User has installed and started the game application, has created an account, and signed in with that account within the game app.
<u>Success Guarantee</u>	The player has chosen the level he wants to play, the level loads successfully and gameplay begins.
<u>Main Success Scenario</u>	<ol style="list-style-type: none"><li>1. System asks the player to choose single-player or multi-player mode.</li><li>2. Player chooses single-player mode.</li><li>3. System prompts the user to choose from the available levels, with an indication as to which ones are unlocked.</li><li>4. Player chooses one of the unlocked and available levels.</li><li>5. System initiates a single-player game session on the selected level and gameplay begins.</li></ol>
<u>Extensions</u>	<ol style="list-style-type: none"><li>4a. Player chooses a level he has not unlocked yet.<ol style="list-style-type: none"><li>i. The system ignores the player's choice and allows him another chance to choose a level</li></ol></li></ol>

# Use Cases

Use case: Play single-player game

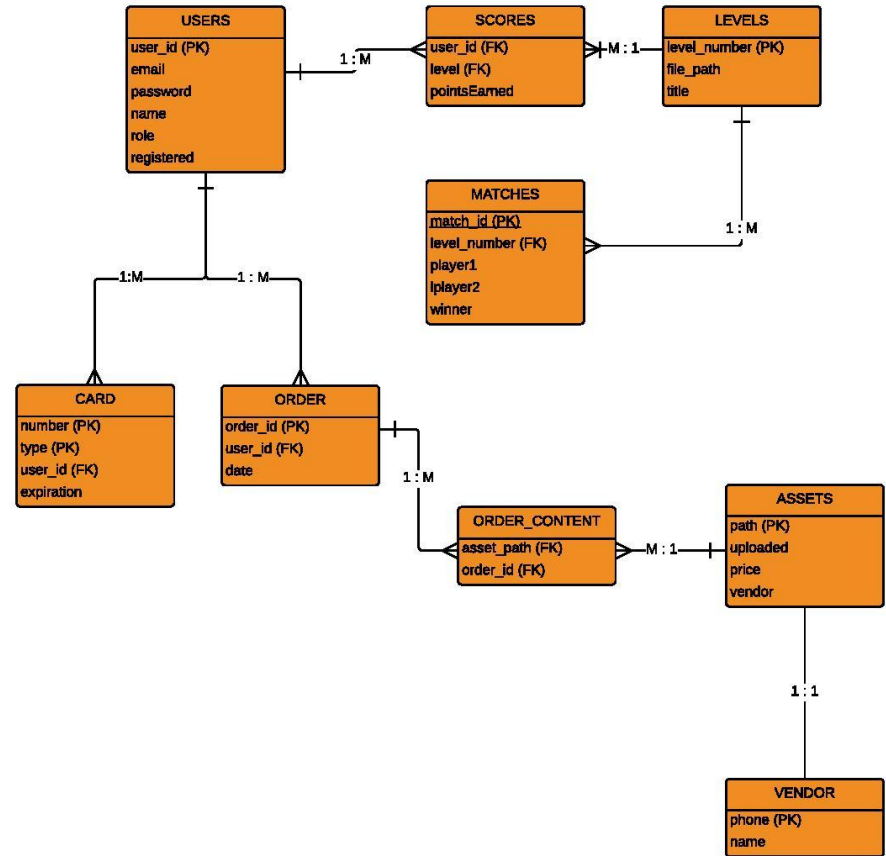
<u>Use Case Name</u>	Play single-player game
<u>Scope</u>	Plumbers on ICE Game App
<u>Level</u>	User goal
<u>Primary Actors</u>	Player
<u>Stakeholders and Interests</u>	- Player: Has the goal of reaching the end of the current level in the shortest amount of time that he can, while collecting coins to increase his score.
<u>Preconditions</u>	User has initiated a single-player game session
<u>Success Guarantee</u>	The player is able to reach the end of the level, with a certain level of difficulty depending on the particular level, and his score is recorded if it exceeds his previous best score for the level.
<u>Main Success Scenario</u>	<ol style="list-style-type: none"><li>1. The player's character starts at the predefined starting point for the level.</li><li>2. The player has two basic actions available to him: Walk forward, and jump.<ol style="list-style-type: none"><li>i. <b>Walk forward:</b> The player's character proceeds horizontally, to the right. If this input is held down, this action continues until it is released.</li><li>ii. <b>Jump:</b> The player's character 'jumps' in the upward direction and is pulled back down due to gravity.</li><li>iii. These two actions can be <b>combined</b> by using Jump while holding Walk forward. The character will leap upward while maintaining its horizontal velocity – allowing for the player to leap between platforms and over obstacles.</li></ol></li><li>3. The player navigates through the level by using appropriate actions while avoiding hazards and collecting coins.</li><li>4. The player succeeds in reaching the end of the level.</li><li>5. The system calculates the player's score, based on elapsed time and coins collected.</li><li>6. A message is displayed, along with the player's score.</li></ol>
<u>Extensions</u>	<ol style="list-style-type: none"><li>3a. Player allows the character to come into contact with an 'enemy' or other hazard, or the character falls to the bottom edge of the play area.<ol style="list-style-type: none"><li>i. The character 'dies' and is placed again at the current level's starting point. The main scenario begins again.</li></ol></li></ol>

# Site Map

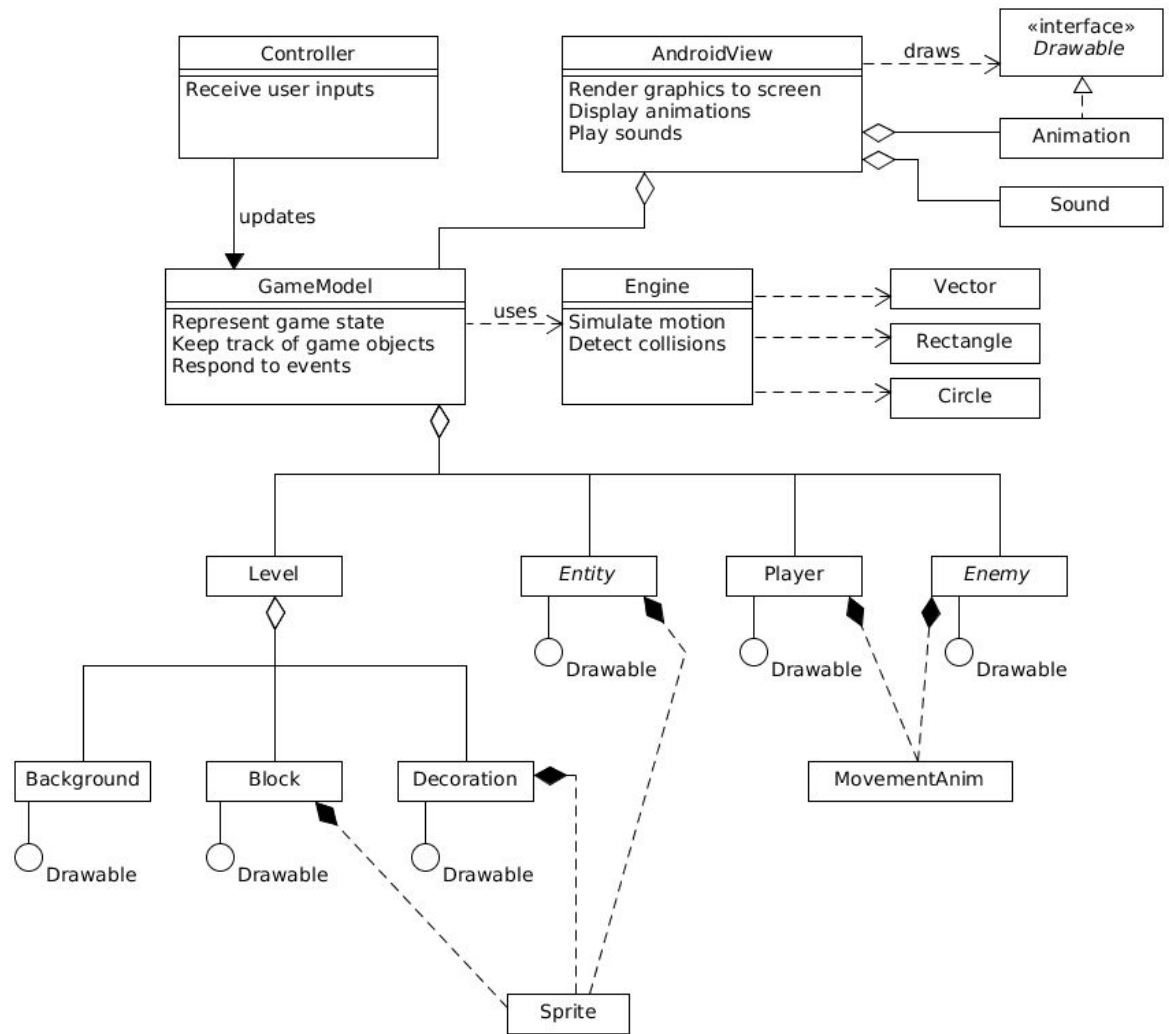




# Entity Relationship Diagram



# Class Diagram



# Sequence Diagram - Register Account

