

## ❖ System-Level Data Model

- The system-level data model in this scenario is minimalistic, prioritizing a memory-based tracking system without persistent storage. It manages only the player's score and progress during gameplay. No role-based access control is required, as each playthrough is independent following the framing of the classic arcade model.

## ❖ The game follows a one-shot model, meaning:

- Players have a set number of lives.
- If lives reach zero, the game ends, and they must restart from the main menu.
- Players can quit voluntarily at the start of a new level.
- Only if a player's final score is competitive will they be prompted to enter their name for leaderboard ranking.

## ❖ Primary Actors

- **Player (Bucky)**
  - **Attributes:** Lives, Score, Movement Speed, Position
  - **Behaviors:** Jump, Climb, Collect Power-ups, Avoid Obstacles, Take Damage
- **Enemies (Old Bucky Mascot, Crabs, Seagull/Pelican Dropping Items)**
  - **Attributes:** AI Type (Stationary, Patrolling, Chasing), Damage, Spawn Patterns
  - **Behaviors:** Move, Attack, Block Player Progress, React to Player Actions
- **Level Manager**
  - **Attributes:** Current Level, Win/Loss Conditions, Timer, Score
  - **Behaviors:** Load Levels, Track Player Progress, Manage Transitions
- **Major Objects**
  - **Platforms & Climbing Objects** (Ladders, Ropes, Moving Platforms, Barrels)
  - **Functionality:** Allow movement and traversal
- **Hazards & Obstacles** (Rolling Barrels)
- **Functionality:** Deal damage, hinder movement

## ❖ Game States Reviewed:

- **Start Menu**
  - Player selects **Start** → Transitions to **Instructions**
  - Player selects **Quit** → Exits the game
- **Instructions Screen**
  - Player reads instructions → Proceeds to **Level 1**

➤ **Gameplay Loop**

- **Normal State:** Player navigates obstacles, climbs, avoids enemies.
- **Damage State:** Player is hit → Lives/Health decrement.
- **Power-Up State :** Triggered when the player collects a power-up, modifying their abilities temporarily.
  - ◆ **Combat-Based Power-Ups**
    - **Sword** – Short-range melee weapon effective against close-range enemies.
    - **Flintlock Pistol** – Long-range projectile weapon with a set number of shots.
  - ◆ **Health and Survival-Based Power-Ups**
    - **Coconut** – Grants the player **+2 additional lives**.
    - **Bottle of Rum/Wine** – Fully restores health or provides temporary damage resistance.
  - ◆ **Invincibility Power-Up**
    - **Treasure's Blessing (Treasure Chest)** – Temporarily grants invincibility, represented by a golden aura around the player.
  - ◆ **Environmental Activation Power-Up**
    - **Siren's Song (Bugle/Horn)** – Triggers a **thunderbolt strike**, eliminating all enemies on-screen.
- **Score:** Enemies Defeated + Time taken to beat level time a base level completion score
- **Zero Lives → Game Over Screen.**
- **Level Completion** → If the player reaches the top platform, the next level loads.
- **Voluntary Exit** → Player can quit at the start of a new level.

➤ **End Conditions**

- **Win State:** If all levels are completed and a high score, a Leaderboard Entry is prompted.
- **Game Over State:** If lives reach zero, the game resets to the Main Menu to restart or quit.

