**Software Design Document:**

* **System Overview:**
  + The *Cleaners* system is designed to enhance the longevity and balance of the game world by controlling pollution levels. It introduces dynamic "Cleaner" agents that automatically respond to increased pollution levels and initiate actions to reduce it.
* **System Context:**
  + Cleaner (main actor)
  + PollutionManager (central pollution tracking system)
  + Environment/World (source of pollution increase)
  + The PollutionManager observes pollution sources.
  + Cleaners observe the PollutionManager.
  + When pollution crosses a threshold, Cleaners are notified to act.
* **Key Features and Functionality:**
  + Automatic pollution tracking.
  + Automatic notification to Cleaners.
  + Dynamic pollution reduction behavior.
  + Enhances sustainability within the game world.
* **Assumptions and Dependencies:**
  + Pollution values increase due to external in-game events.
  + The game engine supports observer behavior
  + Cleaners are registered with PollutionManager.
  + PollutionManager must be updated regularly
* **Architectural Design:**
* **Component Design:**
* **Data Design:**
* **Design Patterns:**

**i)Name: Observer Pattern**

**ii) Why:**

Because Cleaners must react automatically to pollution changes tracked by a central system. The Observer Pattern is ideal for reactive systems like this.

**iii) Describe how:**

A central object called PollutionManager keeps track of pollution. Cleaners subscribe to changes in this value. When pollution increases, all subscribed Cleaners are notified and act to reduce it

* **Implementation Notes:**
* **User Interface Design:**
  + Environmental feedback:
* **External Interfaces:**