■ Hungry Dog – Updated Requirements Document

This document describes the updated requirements for the game *Hungry Dog*, based on the latest concept: the **player controls the human caretaker** who tries to stop a mischievous dog (AI) from eating dangerous food. The game is an AI showcase with simple, fun gameplay for public demos.

1. Vision & Goal

A fun, fast-paced game where a human player prevents a mischievous AI-controlled dog from eating random snacks. The dog learns and adapts its strategy, while the human must discipline, block, and clean up food to keep the dog safe. The game showcases AI learning for open-day demos.

2. Core Gameplay

- Player controls the **human caretaker**.
- AI controls the **dog**: seeks food, learns avoidance, sets traps.
- Random snack spawning: chocolate (life loss), cheese, dog food, poison (instant death).
- Dog needs **1.5 s** to eat a snack (interruptible except poison).
- Player can **discipline** dog 0.5 s before it finishes eating (key press within range).
- Player can **remove snacks** to reduce clutter; too much clutter → game over.
- Dog can **drop poop traps**; stepping on them stuns human 3 s.
- Stepping on snacks also stuns human 3 s.
- Dog has 3 lives: 3 chocolates = death; poison = instant death.
- Victory if the dog becomes disciplined and stops eating dangerous food.
- Game starts from a **start screen** with character selection and one map.
- Game ends on dog death, poison, clutter overload, or successful training.

3. AI Features

- Dog is a **learning AI agent**: adapts to player behavior and changing rules.
- Learns snack priority (value, distance, danger).
- Can avoid player's discipline range.
- Strategically places poop traps.
- Adapts to live rule changes (e.g., snack rewards) without restart.
- Toggle between **static bot** and **learning AI** for demos.

4. Non-Functional Requirements

- Smooth gameplay at 60 FPS on standard PCs.
- Loading time <5 s.
- Reset button restarts game and AI instantly (<1 s).
- Color-safe visuals and clear feedback cues.
- Quick start: tutorial + first round <30 s to understand.
- Stable for 1h demo sessions without crash.

5. User Stories (High-Level)

- US1: Start screen & character selection.
- US2: Map & starting positions.

- US3: Snack spawning & types.
- US4: Dog eating timer & rules.
- US5: Discipline mechanic.
- US6: Remove snacks (cleanup).
- US7: Snacks block paths.
- US8: Poop trap causes human stun.
- US9: Snack contact stun (human).
- US10: Dog lives & instant death.
- US11: Victory: disciplined dog.
- US12: HUD & feedback.
- US13: Controls & accessibility.
- US14: Dog AI: targeting & eating behavior.

6. Acceptance Criteria

- Dog AI adapts snack priorities within ≤5 items after rule change.
- Player can interrupt dog if within 0.5 s window before eating.
- Dog life and death rules correctly applied (3 chocolates or poison).
- HUD shows lives, timers, clutter.
- Game can reset and restart in ≤1 s.
- Stable 60 FPS and crash-free for 1h demo.

7. Risks & Mitigation

- AI behavior too complex for laypersons → add overlays and simple explanations.
- Performance drop with many snacks → optimize spawn limits and AI pathfinding.
- Player confusion → clear HUD, tutorial, and feedback cues.

8. Definition of Done

- All Must-have user stories implemented.
- Acceptance criteria passed.
- Demo build stable for 1h.
- Clear tutorial, HUD, and reset function.
- AI adaptivity demonstrable with rule change.