Testing and Verification (Step 5)

Test Case 1: Normal Scheduled Feeding,Pet Eats
Input: 8:00 AM, food available, no manual override.
Expected Output: Servo dispenses food, bowl weight drops by ≥5g, no alert triggered.
Actual Output: Bowl weight reduced by 6g, no alert.
Result: Pass,system worked correctly.

Test Case 2: Scheduled Feeding ,Pet Does Not Eat
Input: 6:00 PM, food available, no manual override.
Expected Output: Food dispensed, bowl weight remains almost unchanged (<5g difference), alert triggered.
Actual Output: Weight decreased by only 2g, alert sent.
Result:Pass,alert system functioned as designed.

Test Case 3: Partial Feeding Not Detected
Input: Feeding at 8:00 AM, food available, pet consumes only 2g.
Expected Output: Alert triggered since change is <5g.
Actual Output: Alert not generated — system failed to recognize partial feeding.
Result: Fail,incorrect assumption about feeding.
Test Case 4: Servo Motor Failure
Input: 6:00 PM feeding time, food available, no manual request.
Expected Output: Servo rotates, food dispensed, bowl weight decreases.
Actual Output: Servo malfunctioned, no food released, weight unchanged, no error alert.
Result:Fail ,failure not detected.

Test Case 5: Manual Feeding
Input: Manual button pressed, food available.
Expected Output: Servo dispenses portion, bowl weight decreases ≥5g, no alert.
Actual Output: Weight reduced by 5g, no alert.
Result:Pass,manual function successful.

Test Case 6: Empty Food Storage
Input: 8:00 AM feeding time, bin empty.
Expected Output: No servo action, alert for refilling.
Actual Output: Alert generated correctly.
Result:Pass,food availability detection worked.

Discussion of Issues

The system's logic exposes two main weaknesses:
1. Rigid 5g Threshold:
The system assumes any change below 5g means no food was eaten.
This fails for small pets or partial consumption (e.g., a cat eating 2–3g).

2. No Servo Feedback:
If the motor fails, the system does not detect that food was never dispensed.
This can result in missed feedings going unnoticed.

Refinements Suggested

- Adaptive Thresholds: Allow staff to configure the weight sensitivity according to pet size and meal portions.
- Multi-Interval Monitoring: Check bowl weight multiple times (e.g., every 5 minutes for 30 minutes) instead of once after 10 minutes.
- Motor Feedback Mechanism: Add a sensor to confirm servo rotation.
- Visual/Motion Verification: Use a simple motion sensor or camera to confirm pet activity near the bowl.
- Enhanced Alerts: Integrate mobile notifications or a web dashboard for quicker responses by staff.