## Step 5: Test and Refine the Solution (Debug and Verify)

1. **Normal Feeding (Pet eats as expected)**
   * Input: Scheduled feeding time 6:00 AM; bowl empty; food bin has enough food; pet eats within 10 minutes.
   * Process: Servo motor dispenses food → bowl weight increases → after 10 minutes, bowl weight decreases.
   * Expected Output: Log “Feeding successful”.
   * Discussion: The system works correctly under normal conditions.
2. **Pet does not eat**
   * Input: Scheduled feeding time; food bin has food; bowl weight increases after dispensing, but no decrease after 10 minutes.
   * Process: Servo motor dispenses food → bowl weight unchanged after waiting period.
   * Expected Output: Log “Food hasn’t been consumed”; system sends alert to staff. However, instead of one fixed 10 minutes, allow configurable timers per pet (small vs large pets eat at different speeds).
   * Discussion: Highlights the need for timely human intervention (possible illness, stress, or food dislike).
3. **Food bin empty**
   * Input: Scheduled feeding time; food bin sensor shows empty; no food dispensed.
   * Process: Sensor confirms nothing dispensed 🡪 alert staff.
   * Expected Output: Log “Feeding failed – food bin empty”; alert staff.
   * Discussion: add a low-food warning before it reaches empty ( <10% of bin capacity).
4. **Sensor error ( Suggest improvements )**
   * Input: Scheduled feeding time; servo rotates, but bowl weight sensor shows no change.
   * Process: Attempted dispensing but no food delivered or bowl weight sensor got problems.
   * Expected Output: Log “Feeding failed – mechanical error”; alert staff.
   * Discussion: Critical to ensure fail-safe alerts if the hardware malfunctions.
5. **Pet plays with food (false trigger, suggest improvements )**
   * Input: Food dispensed, pet knocks food out without eating.
   * Process: Bowl weight decreases too quickly.
   * Expected Output: System might incorrectly log “Pet ate food”.
   * Discussion: Suggest adding a camera or motion sensor for more reliable monitoring in future improvements.