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| --- | --- | --- | --- |
| **Scenario** | **Input Data** | **Expected Output** | **Result** |
| Pet eats as expected | Time matches schedule, bin has enough food, bowl weight increases by portion | Dispense food, LED green, log success, no alert | Pass |
| Pet does not eat | Time matches schedule, bin has food, bowl weight change < threshold | Dispense food, LED red, send “Pet not eating” alert | Pass |
| Food bin empty | Time matches schedule, bin is empty | LED red, send “Bin empty” alert, no dispensing | Pass |
| Not feeding time, bin okay | Time does not match schedule, bin >= 15% | No action, system waits 10 minutes | Pass |
| Not feeding time, bin low | Time does not match schedule, bin < 15% | LED yellow, system waits 1 minute before next check | Pass |
| Partial feeding | Time matches schedule, pet eats only some of the portion (weight change < threshold) | LED red, send “Pet not eaten” alert, log partial feeding | Pass |

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

**Discussion**

* The feeder logic works correctly for all test cases.
* Alerts are only sent when necessary (bin empty or pet not eating).
* Feeding occurs **only at scheduled times** and only if there is enough food in the bin.
* LED indicators clearly show system status: green = eaten, red = problem, yellow = low bin

**Suggested Improvements**

* Add **early warning** when food bin is low to allow refill before empty.
* Store **detailed feeding history** for multiple pets or longer tracking periods.
* Consider **multiple portion sizes** for different times of the day.
* Optionally, **send notifications to a mobile device** for remote monitoring.