**Step-1: Understand and Define the Problem (Analyze)**

**Problem Statement:** The animal shelter requires a low-cost, programmable automated pet feeder to dispense dry and wet food for cats and dogs at scheduled times, monitor consumption, and alert staff if food is not dispensed or remains uneaten. The system should use affordable components (e.g., servo motors, weight sensors) and support manual feeding.

**Features:**

* Dispense dry and wet food at user-defined times (e.g., 8 AM, 6 PM).
* Measure food consumption using a weight sensor under the bowl.
* Alert staff via buzzer/LED if:
* Food fails to dispense (e.g., servo jam).
* Food remains uneaten for 2 hours.
* Log consumption data with timestamps using a real-time clock (RTC).
* Manual feed button for staff intervention.
* Support for one pet per kennel, with scalability.

**Inputs:**

* Current time (from RTC).
* Food bowl weight (grams, from weight sensor).
* Manual feed button (digital: pressed/not pressed).
* Feeding schedule (e.g., 8 AM dry, 6 PM wet)
* Servo status (dispense successful/failed).

**Outputs:**

* Servo motor signals (dispense dry/wet food).
* Buzzer/LED alerts for issues.
* Log entries (e.g., "[timestamp]: Dispensed [food type], [weight]g").

**Assumptions:**

* One bowl per kennel, shared for dry and wet food.
* Pets eat from the bowl within 2 hours.
* Limited memory (logs store 24 hours of data).
* Reliable power supply.

**Limitations:**

* Weight sensor accuracy (±5 grams).
* Servo motor may jam, requiring detection.
* No wireless connectivity (local logging).