1. **Understand and Define the Problem (Analysis)**

**Problem Statement:**

The animal shelter in the area needs a low-cost, programmable automatic pet feeder mechanism with the ability to release food in cats and dogs at preset timings. The feeder should keep track of the diet intake and the amount of food ingested. It also needs to raise alert when there is a problem like no food dispensing and or pet not eating. The system one should be made so that the future implementation includes cheap tools like servo motors and simple sensors.

**Assumptions:**

1. The feeder will handle one type of dry pet food.
2. Feeding times are pre-programmed and stored in the device.
3. Power supply (main or battery) is stable.
4. System clock is set accurately.
5. Basic sensors are available for operation: food level sensors, weight sensor under bowl
6. The shelter staff will manually refill the feeder.

**Inputs:**

1. Current time ( from a real-time clock)
2. Feeding schedule (list of times)
3. Portion size
4. Food bin level (from sensor)
5. Bowl weight before and after feeding
6. Motor status
7. Manual override signals

**Outputs:**

1. Motor rotation to dispense food.
2. Stop motor signal
3. Local Alert
4. Feeding log entry (time, food amount).
5. Status LED indicators

**Limitations:**

1. Limited memory
2. Support one type of pet food
3. Sensor accuracy
4. No automatic food refill- requires manual refilling
5. Alerts are local only