Part 1: On the solving problem process

Step 1: Problem Analysis

The automated feeder operates based on predetermined feeding schedules that require exact timing for food distribution. The system requires built-in detection mechanisms to track feeding activity so it can determine whether food has been consumed. System alerts will notify staff when problems occur involving food dispensing or consumption failures. The initial step involves designing and simulating system logic before constructing the actual device from inexpensive hardware components including sensors and servo motors.

It's requirements are:
 - The feeder automatically releases food according to set schedules.
 - The system detects if the dispensed food has been eaten.
 - The system notifies staff if the feeding process fails or food is not eaten.
 - The system allows manual feeding commands.

Possible assumptions or limitation

 Assumptions:
 - Feeding schedules are set in advance and it can be modified by staff.
 - Sensors can detect if food has been eaten or not.
- Staff will address any alerts send by the system.
 - Pets have access to the feeder during scheduled feeding times.

 Limitations:
 - The system cannot identify which pet has eaten the food.
- Sensor accuracy may be affected by lighting or food type.
 - The system does not support remote control.
- The feeder gives out the same amount of food every time.

Step : 2

Input and outputs
Inputs:
 - Real time clock
 - Feeding time to cats and dogs
 - Weight Sensor under bowl

Input table

Input	Type	Operational Constraint
Real time clock	Time device	Read correct time
Feeding time to cats and dogs	Time	Max 150 per feed
Weight Sensor under bowl	Weight sensor	Detects when food level drops by about 10%

Outputs:
  - Rotate motor
  - Send alert

Output table

Output	Action	Operational Constraint
Rotate motor	Rotate 90 degree	Motor must rotate exactly as programmed
Send alert	Low food alert, feeding failure	Alert must be sent within 5 second of failure

Step : 3

Desinging the algorithm

1) START
2) READ THE CURRENT TIME
3) IF THE CURRENT TIME MATCHES A FEEDING TIME
 CHECK THE FOOD DISPENSER
    IF NO FOOD IS DETECTED, SEND AN ALERT TO THE STAFF
      ACTIVATE THE MOTOR TO DISPENSE FOOD
 CHECK THE WEIGHTOF THE BOWL
    IF THE BOWL WEIGHT DOES NOT CHANGW WITHIN 10 MINUTES
    AFTER FEEDING, SEND ALERT
4) LOG THE FEEDING ATTEMPT
 5) RETURN TO STEP 2
 6) KEEP REPEATING UNTIL THE SYSTEM IS TURNED OFF
7) END