Step 1: Understand and Define the Problem (Analyse)

Problem Statement

The objective is to come up with the logic that will make a low-cost programmable pet feeder system inside an animal shelter. The system should be able to automate the provision of food at usual times, whether people have taken food, and notify employees on any problem.

Key Features

1. **Scheduled Dispensing:**Release at designated times is necessary with the food.
2. **Consumption Monitoring:** The system must know whether the food in bowl was consumed.
3. **Alert System:** When issues arise, i.e. a failure of dispensing, uneaten food, the staff is to be notified.

Inputs and Outputs

- **Inputs:**
    - **Time Data:** Real time clock to determine pre-set feeding times
    - **Food Level Sensor:** embedded food bin to be able to sense that there is low food supply.
    - **Bowl Weight Sensor:** A detector that is beneath the bowl to weigh the food.
- **Outputs:**
    - **Servo Motor Control:** An instruction to the servo motor to rotate and release some food.
    - **Alert Signal:** A notification to staff (e.g., an LED light, an audible alarm, or a text message).

Assumptions and Limitations

- System enjoys a dependable source of power.
- It deals with single pet food.
- The food bin and bowl is well placed with no interruptions.
- The mass of an empty bowl can be recognized and is fixed.