**Step 1: Understand and Define the problem:**

1. **Problem statement:** An animal shelter needs assistance in designing a low-cost and automatic scheduled pet feeder for cats and dogs. The system can check if the pet has eaten and can also alert the staff member when there are issues with food not being dispensed properly or there is not enough in the bowl.
2. **Features of the Feeder:**

* Scheduled food dispensing for cats and dogs
* Monitoring amount of food consumption (in container and on bowl)
* Alerting staff on system issues

1. **Inputs and outputs:**

* Input:
  + Feeding times (from a clock/timer)
  + Food level from sensor (in container)
  + Food weight from scale (in bowl)
* Output:
  + Food dispensing signal to servo motor
  + Alert from sensor to notify staff when issue occurs

1. **Assumptions and limitations:**

* Electricity supply is stable
* Sensors are consistently monitoring correctly
* There is only one food type in the dispenser
* The food container sensor is weight-based and food level is considered to be Low if there is less than 150g of food in the container
* The staff are available to troubleshoot for the system and feed the pet manually when nessesary

A diagram of a feeder processing unit

AI-generated content may be incorrect.

Figure 1. Block diagram of the system.