

Pet Feeder

Step 1: Understand and define the problem

- Problem Statement
Design a low cost, automatic and programmable pet feeder for a shelter that will dispense food on the given schedule, monitors food consumption and informs staff if food is not eaten or not dispensed. The task is to implement this with simple hardware and uncomplicated logic.
- Features
 - I. Multiple feeding times per day
 - II. Measure proportion of food dispensed during every feeding
 - III. Monitor consumption amount
 - IV. Notify on issues like: food not eaten, food not dispensed, low food or empty pots
- Assumptions and Limitations
 - I. One feeder serves one animal at a time
 - II. Dry food only
 - III. Food portions measured in grams
 - IV. Real time clock in 24-hour format for local time
 - V. Sensors: **load cell** under bowl (weight), **bin level** sensor (empty/low), **optical/IR** chute sensor (jam/no-dispense)
 - VI. Power interruptions handled by stop motor, retain schedule in non-volatile memory
 - VII. if offline, alerts via **buzzer/LED + on-screen message**; if online, alerts via **SMS/email/app**
- Inputs and Outputs

INPUT	OUTPUT
Food feeding times	Servo motor control (open/close gate)
Food portion size	Display Update
Time tick for clock	LED/Buzzer
Bowl weight	Alerts via SMS/email/app
Bin level	Sensor Data logs
Optical sensor	
Network connection availability	

- Simple Block Diagram

