# Dr. Pill

Group 11

# Introductions

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# Overview

# Motivation

**Retirement Homes**

**Nurses**


**Personal Home Care**

# Market Research

## Spencer


## Hero Pill Dispenser


Device

+


App

# Technical Approach

**Scanning**

**GUI/Screen**

**Storing**

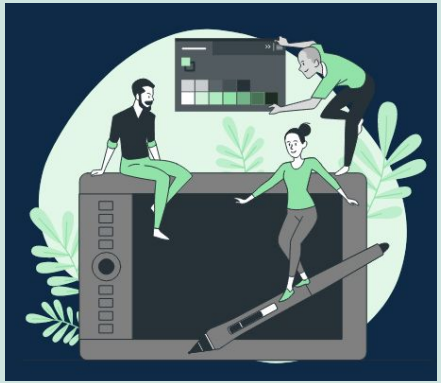
**Dispensing**

**Tracking**

# Scanning

## Technical Approach

- Scan label on pill bottle with camera
- Use computer vision software (OpenCV) to read text
- NLP software to get dosage/frequency to make schedule
- Tools:
  - Camera
  - Python, OpenCV
  - NLP
  - C/C++



# Screen/GUI

## Technical Approach

- Screen at the front of the device
- Display pill schedule
- Edit schedules
- Button to begin process of adding new pills
- Button to delete pills
- Tools:
  - LCD Touch screen
  - Python framework (Kivy): Raspberry pi
  - C++  (Processing): Arduino Nano

# Storing

## Technical Approach

- Store multiple types of pills
- Pills dumped into top of device
- Stored in empty slot in holding container
- Tools:
  - Holding container with sections
  - Stepper motors

# Dispensing

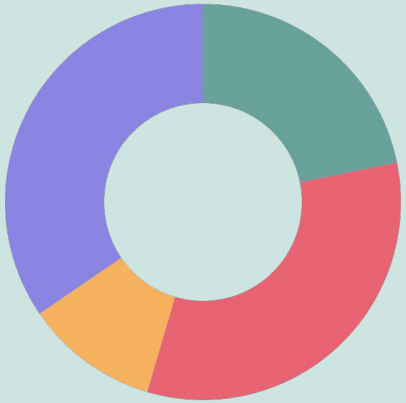
## Technical Approach

- Dispense pills at the correct time
- Dispense the correct number of pills
- Signal that pill has been dispensed
- Tools:
  - Adjustable nozzle
  - Stepper motors
  - IR break-beam sensor

# Tracking

## Technical Approach

- Saas application for care staff/nurses
- Track information from multiple dispensers
  - Pills that residents have not taken
  - Pills needing refills
- Tools:
  - Cloud computing services (AWS, Azure)
  - IR break-beam sensor



# Feasibility

Group Knowledge:

- Microcontroller programming
- PCB design
- Computer vision
- 3D printing and modeling

Resources:

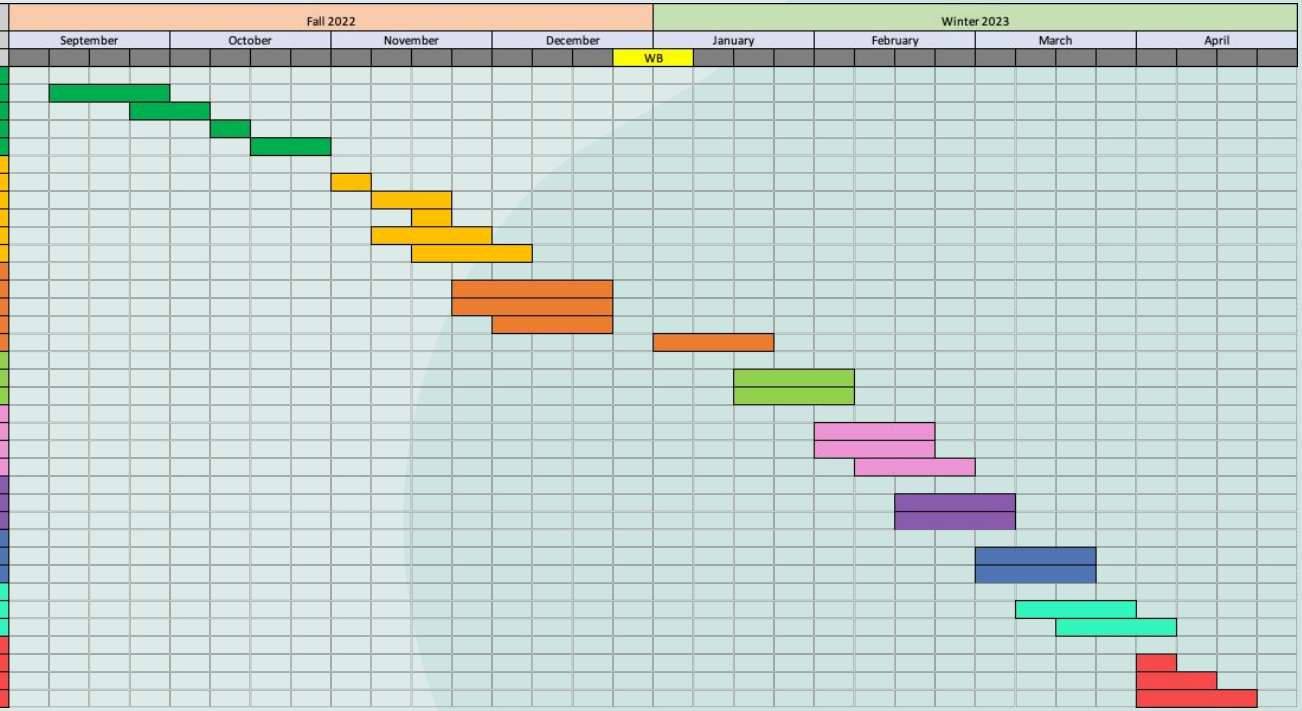
- Servo Motors
- Arduino Nano
- GUI LCD Screen
- Physical Casing
- Webcam
- IR Sensor

Budget: $200

# Schedules and Activities

# Gantt Chart

| EE4OI6 Milestone | Group 11 |
|---|---|
| Sections | Duration |
| Planning: | |
| 1.Group Formation | Sep 12 - Sep 30 |
| 2.Project Planning | Sep 26 - Oct 7 |
| 3.Communication to Professor | Oct 8 - Oct 16 |
| 4.Proposal and Presentation | Oct 17 - Late October |
| Research Startup: | |
| 1.Technology Review Meeting | Nov 1 - Nov 7 |
| 2.Rough Design Diagram | Nov 8 - Mid November |
| 3.Budgeting Document | Mid November |
| 4.Material Research | Mid November - Late November |
| 5.Software Research | Mid November - Early December |
| Implementation I: | |
| 1.Material Implementation Phase I (Pill Storage Space, PCB) | Late November - Dec 18 |
| 2.Software Implementation Phase I (Software Script) | Late November - Dec 18 |
| 3.Project Progress Report I | Early December - Dec 18 |
| 4.Project Progress Presentation | Early January - Mid January |
| Implementation II: | |
| 1.Material Implementation Phase II (Stepper Motors, PCB) | Mid January - Early February |
| 2.Software Implementation Phase II (Program Loading I) | Mid January - Early February |
| Testing Phase I: | |
| 1.Hardware Testing Phase I (Pill Storage Mechanical Function) | Early February - Mid February |
| 2.Software Testing Phase I (Command Stepper Motors) | Early February - Mid February |
| 3.Project Progress Report II | Late February - Late February |
| Implementation III: | |
| 1.Material Implementation Phase III (Stepper Motors, PCB) | Mid February - Early March |
| 2.Software Implementation Phase III (Program Loading II) | Mid February - Early March |
| Testing Phase II: | |
| 1.Hardware Testing Phase II (Stepper Motors Mechanical Function) | Early March - Mid March |
| 2.Software Testing Phase II (Display and User Input Interphase) | Early March - Mid March |
| Final Integration: | |
| 1.Pill Dispenser Hardware Integration (Assembly) | Mid March - Late March |
| 2.Pill Dispenser Software Integration (Final Programing) | Mid March - Early April |
| Lauch: | |
| 1.Final Testing (Function of Device) | Early April |
| 2.Project Exhibition Preperation | Early April - Apr 11 |
| 3.Final Report | Early April - Apr 16 |



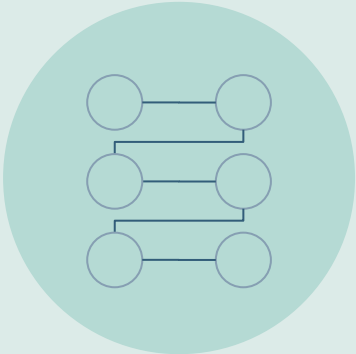
# Deliverables

01 **Bronze** — Storing and Dispensing Pills

02 **Silver** — OpenCV Parsing Information from Pill Bottle

03 **Gold** — Saas Application

# Risks and Alternatives



## Increasing Scope

Adding features to the project as we are in progress

## Campus Closure

Potential campus shut down due to COVID-19

# Thank you :)

# Questions and Answers