

Portfolio
Erkang Xia

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About Me •

Hi, I am Erkang who values the power of knowledge. I graduated from Northeastern University in 2022 and majored in Mechanical Engineering and Robotics.

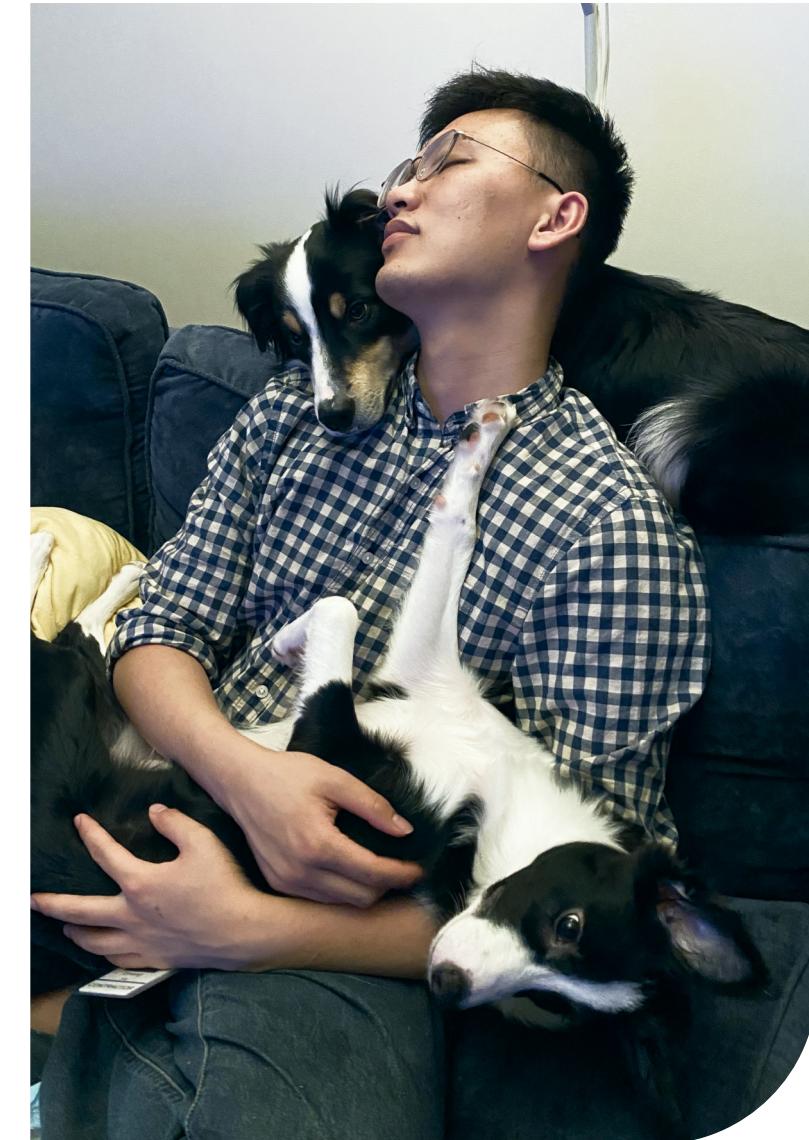
I am actively exploring more possibilities, and that's why my previous Co-op experiences are in the medical industry. I saw the power of engineering within the medical device at Vedanta Bioscience and Insulet Inc. and learned how to design with care.

I do not think my learning will ever stop. I self-taught multiple programming languages, such as Python, Java, Swift, and so on. Currently, I am developing an iOS application called My StockNote for personal development.

Apart from my professional life, I am also the father of two lovely dogs. While I took care of them, I learned how to gain happiness by giving it.



Hiking with co-workers
at white mountain



My two dogs

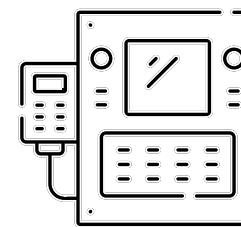
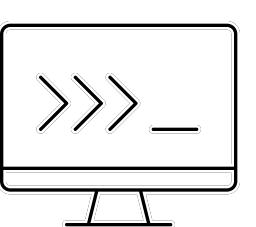


Innovative medical Co-op

Insulet Project •

Insulet, my second co-op, is an innovative medical device company that promotes automated injectable drug delivery with the customizable OmniPod.

I helped create a weekly report system using Python and designed various testing fixtures.



Rewind Fixture

Objective

Designed a fixture for rewinding in battery testing that can hold the part and finally integrate this with a motor

Process

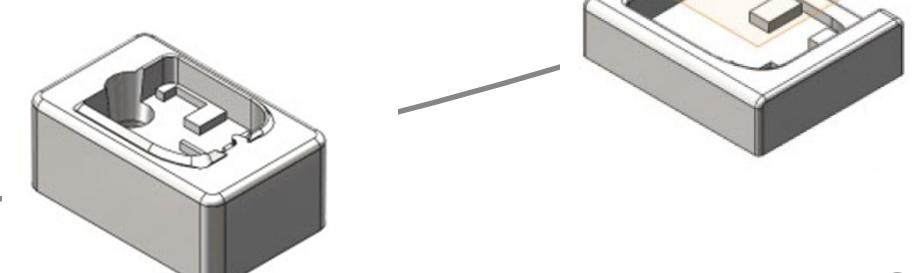
- Designed a fixture that can hold the part
- Addressed a serious follow up problem, such as feasibility, complexity, and extensibility.
- Created a prototype with a 3D printer.
- Tested and iterated

Outcome

- Reduced the battery testing set-up time from 2 minutes to 20 seconds
- Improved the consistency of battery testing by reducing human involvement

Skill Demonstrate

- SolidWorks modeling
- Iterative problem-solving



Initial Design

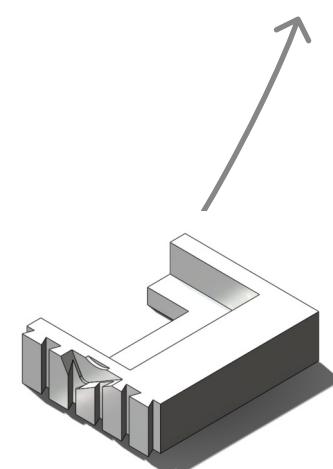
The part tends to get stuck in the fixture

Second Draft

Increased feasibility

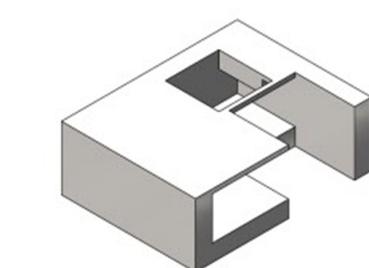
Third Draft

Improved performance
Added complexity - Reduced durability



Final Draft

Added mortise and tenon to build a connection with a motor
Improved Extensibility
Further reduce complexity



Fourth Draft

Reduced complexity
No extensibility

Python Programming for Compiling Excel Files

Background & Problem Statement

- Project Excel files need to be compiled to status report weekly
 - Personally, time spent on the compiling is too long and unacceptable

Process

- Communicated with the project manager to ask permission for the project
 - Found the repetitive pattern within the Excel files
 - Iterated the program to improve fault tolerance, such as human error, a format mismatch
 - Communicated with the team for the programming updating

Outcome

- Reduced the data compiling time from 2 hours to 5 mins
 - Eliminated the possibility of human error

This program now is still running even after I left the company and it has adopted for wider range of the documents

The screenshot shows the PyCharm IDE interface with the following details:

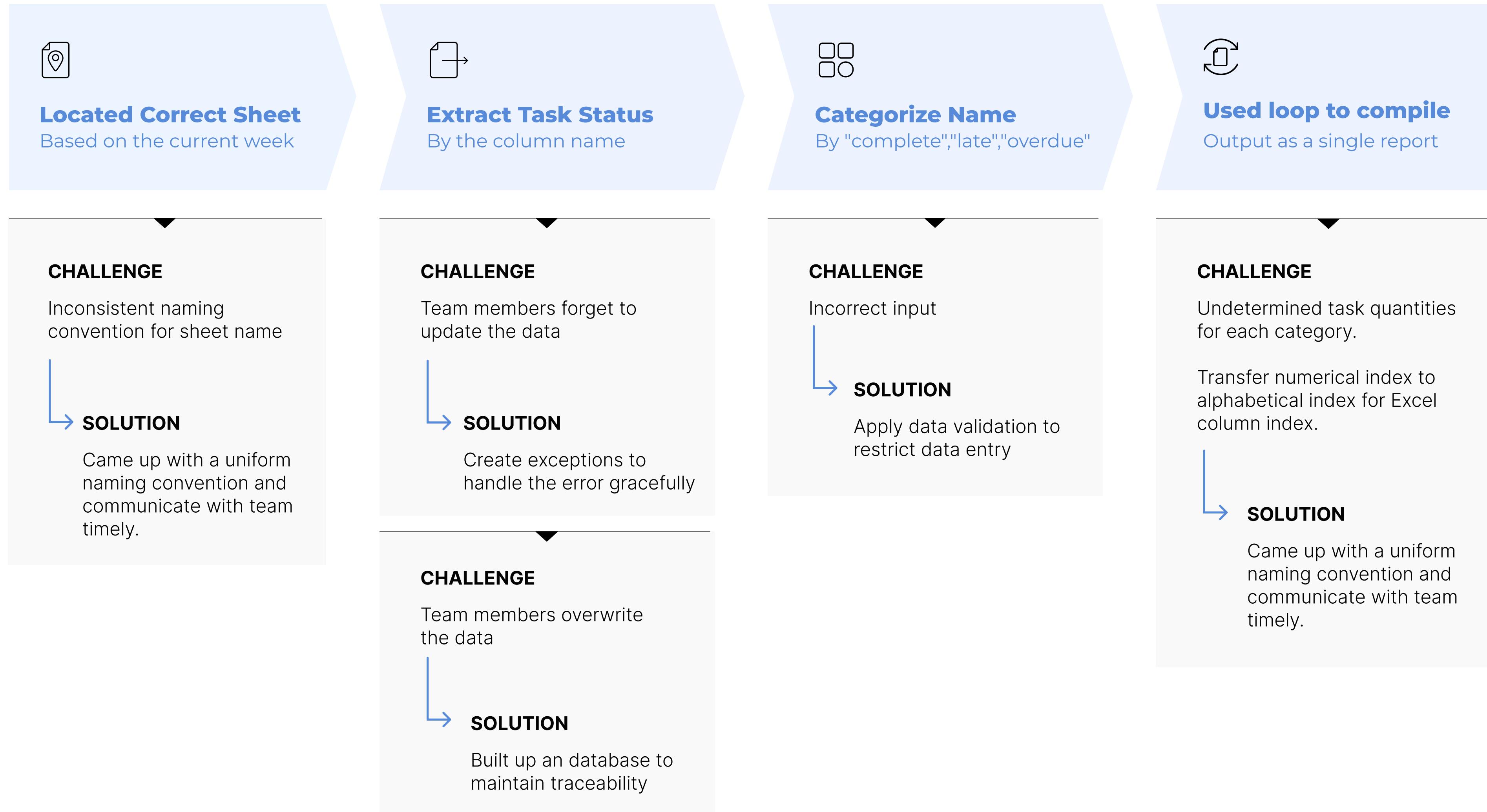
- File Menu:** File, Edit, View, Navigate, Code, Refactor, Run, Tools, VCS, Window, Help.
- Toolbar:** Includes icons for Run, Stop, Refresh, and others.
- Project Explorer:** Shows a project named "Laura" with files "chart.py", "venv", "chart.py", and "Test data for laura.xlsx". It also lists "External Libraries" and "Scratches and Consoles".
- Code Editor:** The main window displays the Python script "chart.py". The code uses the pandas library to read data from an Excel file and the openpyxl library to manipulate it. It defines functions to handle tasks based on file names and sheet names, and includes logic to determine the current week's Monday and Sunday dates.
- Bottom Navigation Bar:** Includes tabs for Run, TODO, Problems, Terminal, Python Packages, Python Console, and Event Log.
- Status Bar:** Shows indexing completion details: "Indexing completed in 35 sec. Shared indexes were applied to 33% of files (3,702 of 10,984), (today 11:27 AM)".

Python Program for compiling Excel files

| Row Labels | 12/19/21 | | | |
|--------------------|----------|----|----|----|
| 13809-07 | | | | |
| 13825-2TR | | | | |
| 13825-10 | | | | |
| 13825-11 | | | | |
| 13825-12 | | | | |
| 13974-05T | | | | |
| 13827-09 | | | | |
| 13974-09 | 47 | | | |
| 14367-06R | 37 | 48 | | |
| 14367-15 | | | | |
| 14367-18 | 25 | | | |
| 15847-09 | | | | |
| 15847-10 | 30 | 41 | 37 | |
| 15848-10 | 27 | | | |
| 15999-08T | 36 | 37 | 34 | 35 |
| 15999-10 | | | | |
| 15999-06RT | | | | |
| Failed to Complete | 3 | | | |
| Completed | 9 | | | |
| Number of Tasks | 12 | | | |
| Completion% | 75 | | | |

Program Output

Python Design Flow

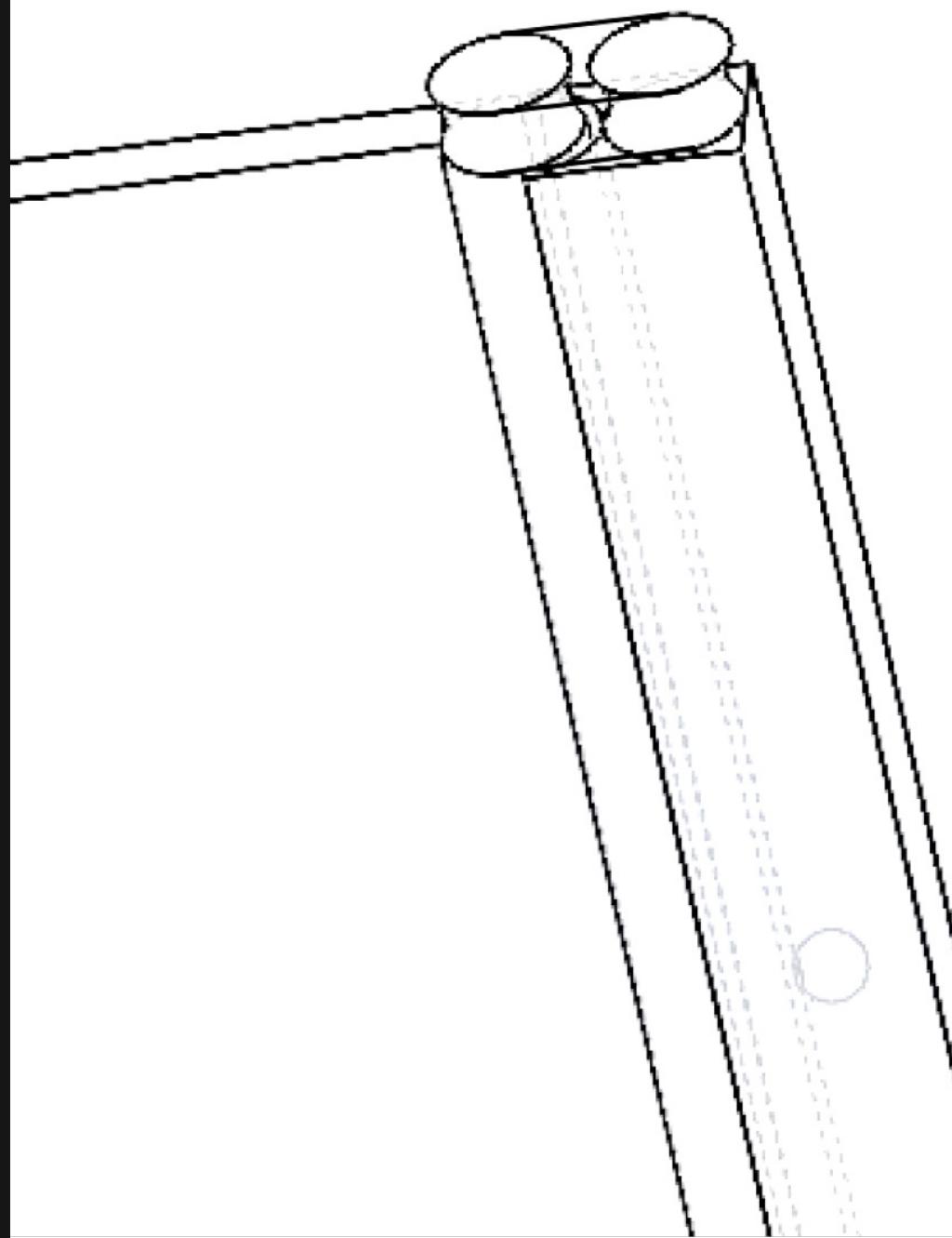


Project for ME 4550

Finger-Protective Door •

Problem Statement

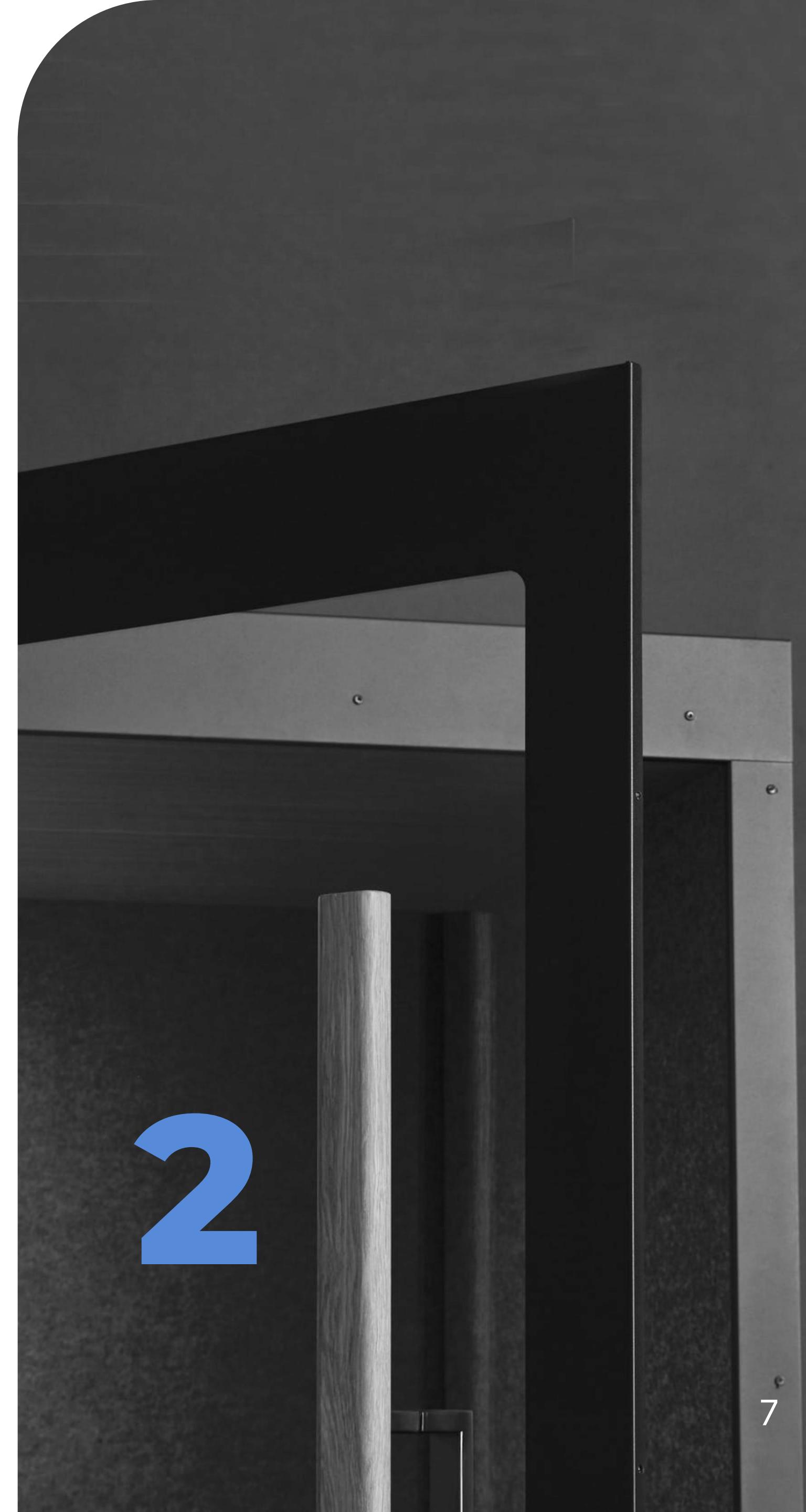
National Safety Council reports more than 300,000 door-related injuries every year. However, there are only a few selections in the market for finger protection from door hinges.



Improvement

Belt Conveyor System

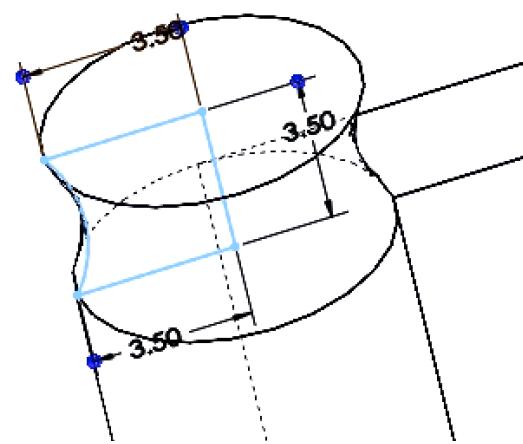
- Secure the door to the wall by adopting a belt conveyor system
- Using belt conveyor system to provide torque, which powers the door to make it automatic



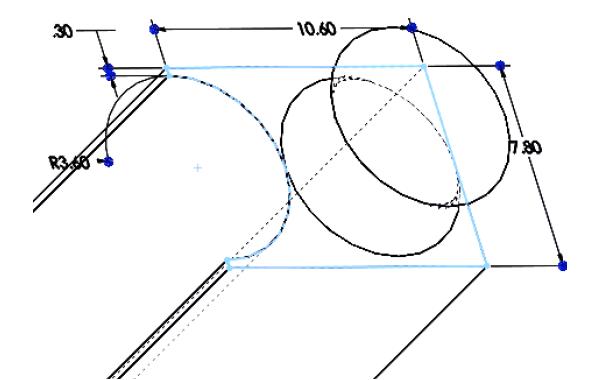
[More Details ...](#)

Round Hinge and Arc Jamb

- Design is consisted of two parts, arc jamb and round hinge. They are Connected by bearing beads and belt
- Motor embedded within arc jamb



Round Hinge

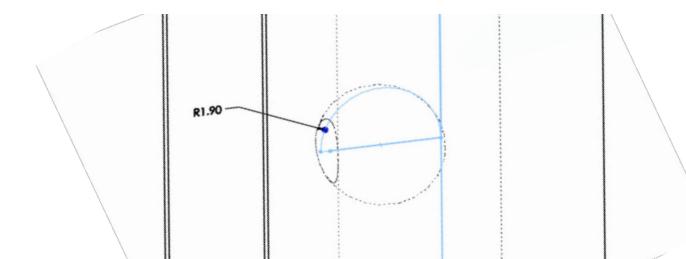


Arc Jamb

- Calculate the torque required to power the door
- calculate the acceleration of the door to provide optimized user experience
- Eliminate the possibility of door injury by design a new form of hinge

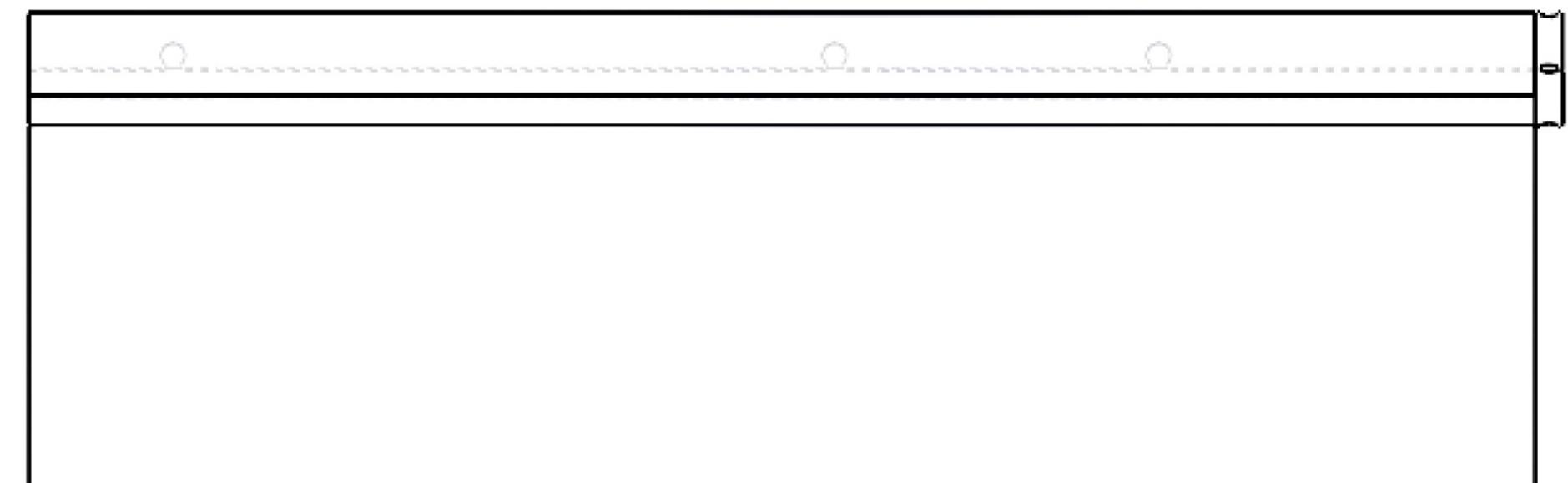
Results

Bearing beads



A small bead between the arc jamb and the round hinge.

The Arc jamb has a groove design that will wrap the most of the bead, so the bead stays inside of the groove. The bead also touches the round hinge. Since the groove of the arc jamb does not wrap the bead entirely. It will leave a relatively small space between the jamb and the hinge. This space should be around 1 or 2 mm. The purpose of beads is to balance the system and leave space to minimize friction and rotational noise.



Personal Project (1)

StockNotes •



Objective

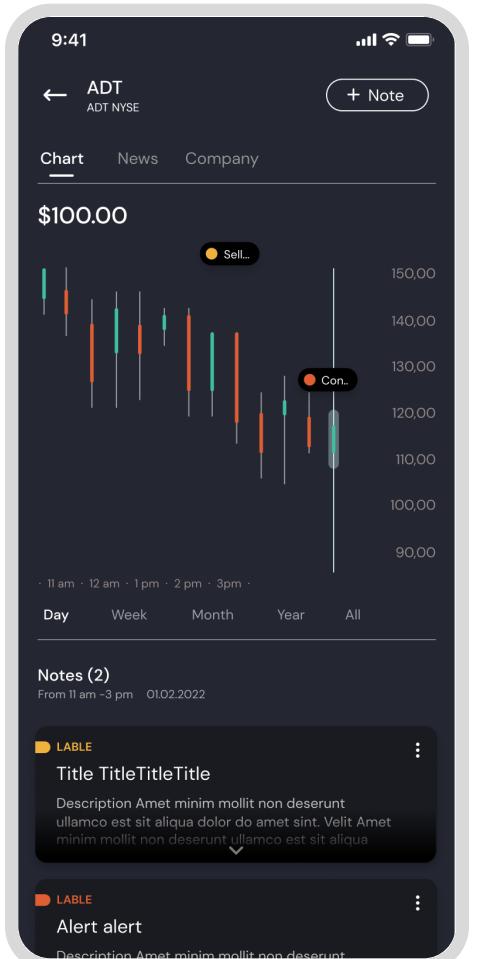
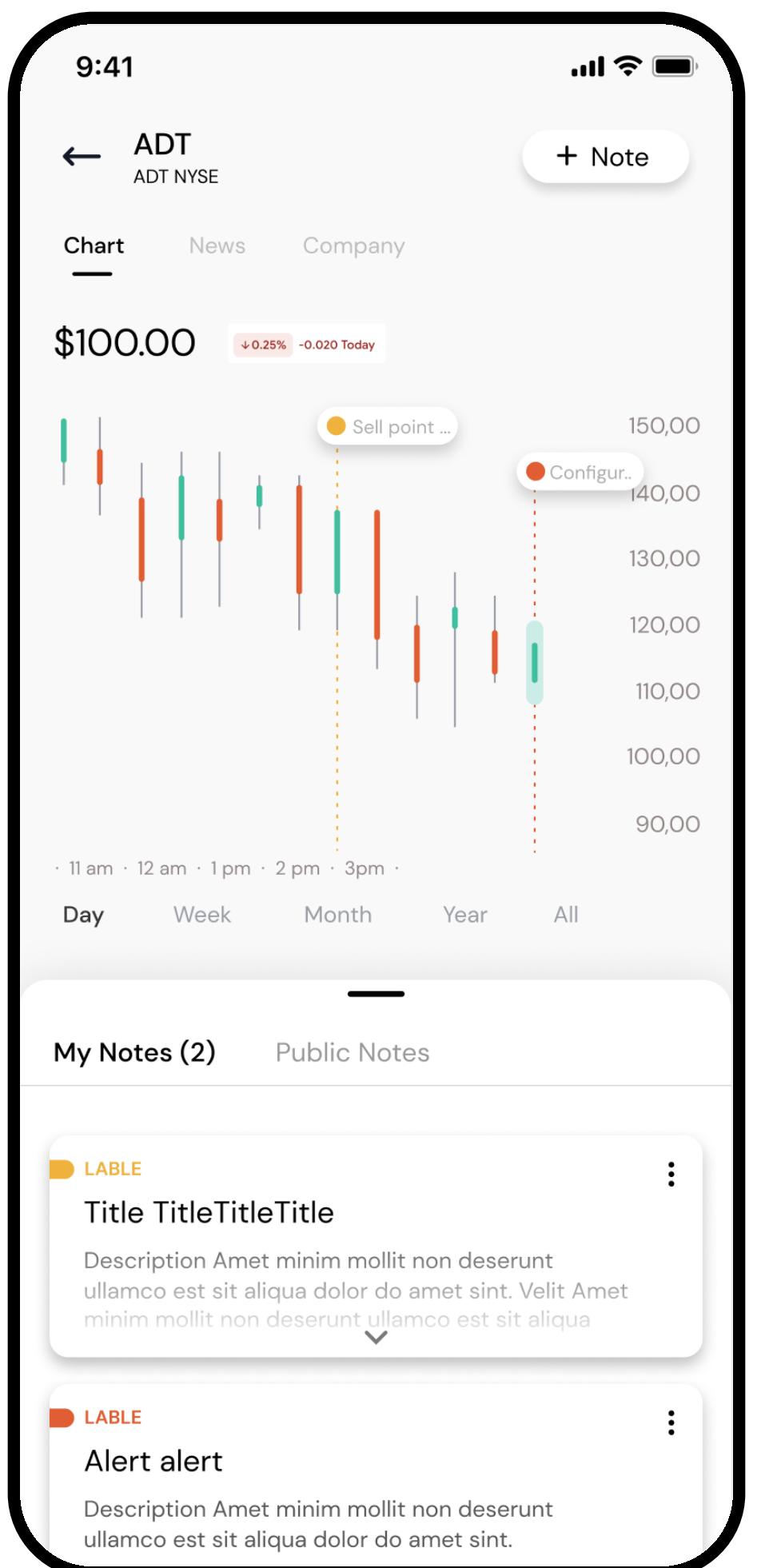
- Help people to track their thoughts throughout daily tradings
- Provide the most updated market news

Skills Demonstrated

- Swift and Git

Challenges

- Get real-time market date and compile it into graph



3

Personal Project (2)

2D Adventure

Objective

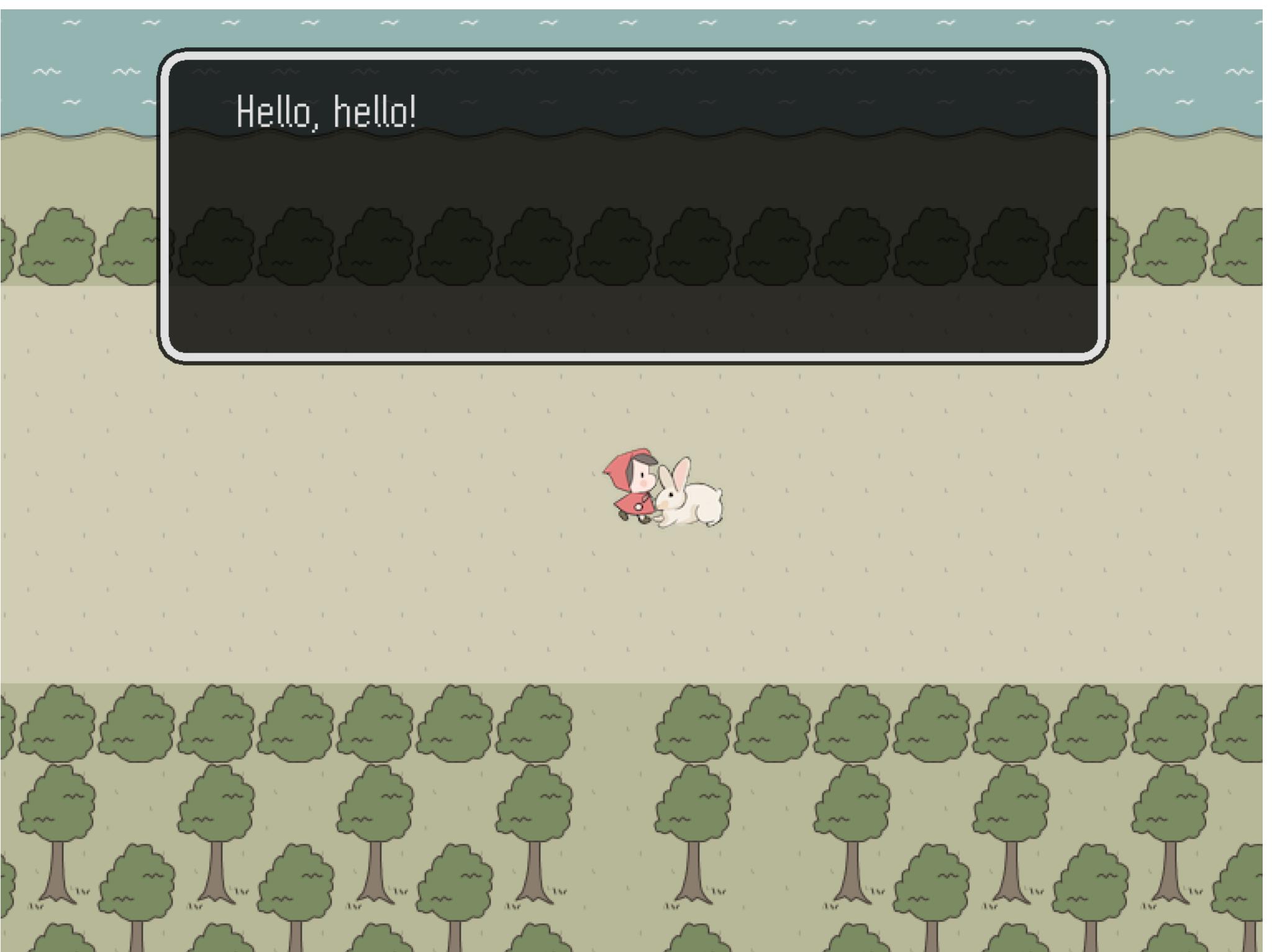
- Help people to track their thoughts throughout daily tradings
- Provide the most updated market news

Skills Demonstrated

- Swift and Git

Challenges

- Get real-time market date and compile it into graph



Certifications •





**Thank you for taking time to review my portfolio.
I hope you like some of my works.**

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