# CSCE 483 Notebook

Connie Liu 528000485

8/24: Intro Lecture, Syllabus Overview

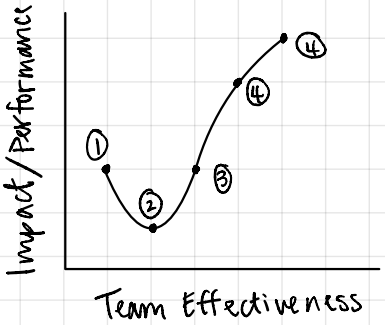
8/29: Teams & Teamwork

Why? Projects are too large to be completed by only one person
Multiple people working together get more done

2-10 people, 10+ gets difficult to manage

Stages:

① Forming → Working Group
② Storming → Pseudo-team
③ Norming → Potential Team
④ Performing → Real & High-Performance Team
⑤ Adjourning




Selecting Team Members
- by relevant skills
  technical, problem, interpersonal
- self-appointed vs. external appointed

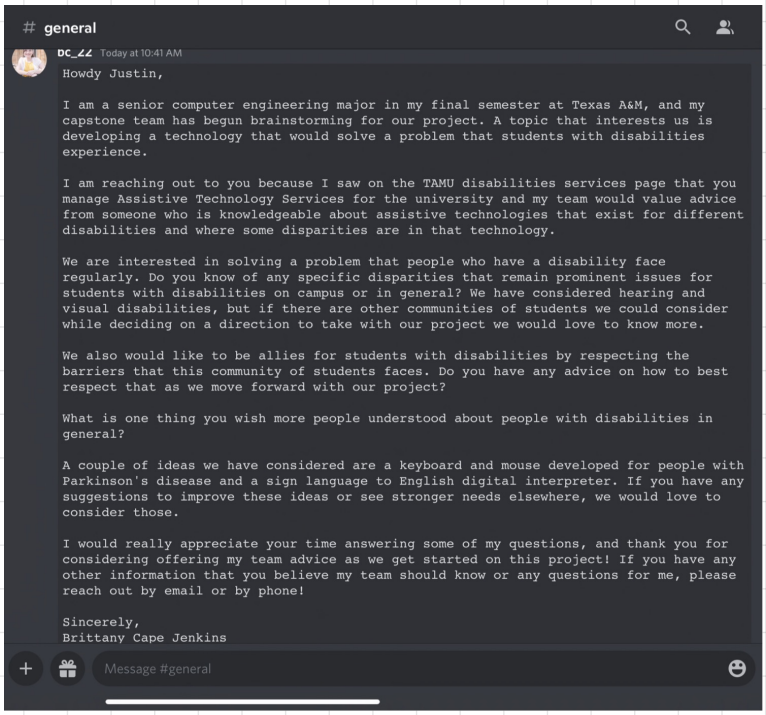
Identify Goals
- properly defined goals are required
- problem statement & requirements specs
- have consensus on both

For Project Proposal:
1. Team Name
2. Mission / Objectives
3. Decision Making
4. Meeting Guidelines
5. Team Roles
6. Conflict Resolution

How to Make Decisions
- by authority
- by expertise
- average opinion
- discussion then authority decision
- minority vs majority
- consensus (time-consuming)

Hold Effective Meetings
Develop Team Roles
Assign Tasks & Responsibilities
Spend Time Together
Respect Each Other
Manage Conflicts Constructively

8/30: Brittany sent out email to Disability Services



# general

DC_22 Today at 10:41 AM

Howdy Justin,

I am a senior computer engineering major in my final semester at Texas A&M, and my capstone team has begun brainstorming for our project. A topic that interests us is developing a technology that would solve a problem that students with disabilities experience.

I am reaching out to you because I saw on the TAMU disabilities services page that you manage Assistive Technology Services for the university and my team would value advice from someone who is knowledgeable about assistive technologies that exist for different disabilities and where some disparities are in that technology.

We are interested in solving a problem that people who have a disability face regularly. Do you know of any specific disparities that remain prominent issues for students with disabilities on campus or in general? We have considered hearing and visual disabilities, but if there are other communities of students we could consider while deciding on a direction to take with our project we would love to know more.

We also would like to be allies for students with disabilities by respecting the barriers that this community of students faces. Do you have any advice on how to best respect that as we move forward with our project?

What is one thing you wish more people understood about people with disabilities in general?

A couple of ideas we have considered are a keyboard and mouse developed for people with Parkinson's disease and a sign language to English digital interpreter. If you have any suggestions to improve these ideas or see stronger needs elsewhere, we would love to consider those.

I would really appreciate your time answering some of my questions, and thank you for considering offering my team advice as we get started on this project! If you have any other information that you believe my team should know or any questions for me, please reach out by email or by phone!

Sincerely,
Brittany Cape Jenkins

Message #general

## Engineering Science vs. Design

Science Problems:
- statements are compact / carefully composed
- specialized knowledge
- readily identifiable closure
- unique & compact solution

Design Problems:
- incomplete / ambiguous problem statement
- broad knowledge from diff disciplines
- no identifiable closure
- no unique or compact solution

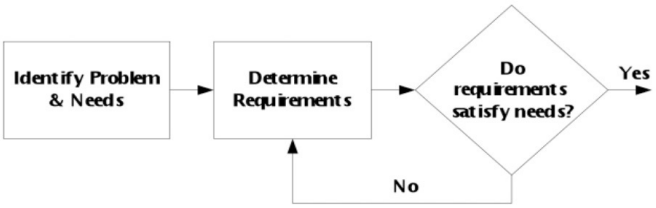
is an iterative design process that aims to meet an objective

## Prescriptive vs Descriptive Design

Prescriptive: sets exact process, algorithmic & managed w/ flow charts

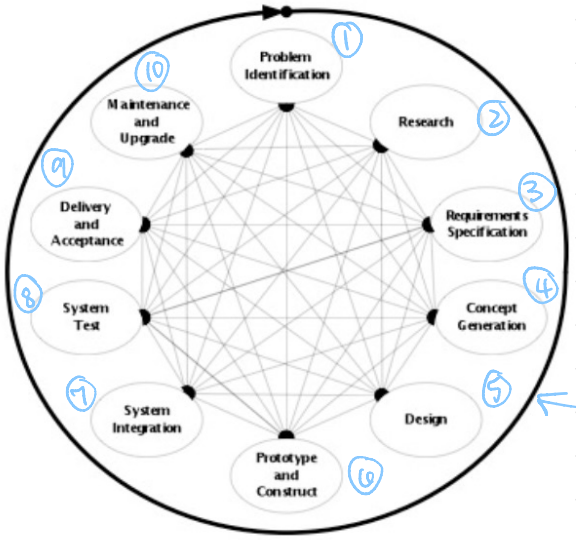
Descriptive: describes typical activities; less formal, less emphasis on exact sequencing

Design processes formalize thought processes → team is more synchronized




Unrealistic
Ignores iterative design
Better for simpler projects

Prescriptive Flow Chart

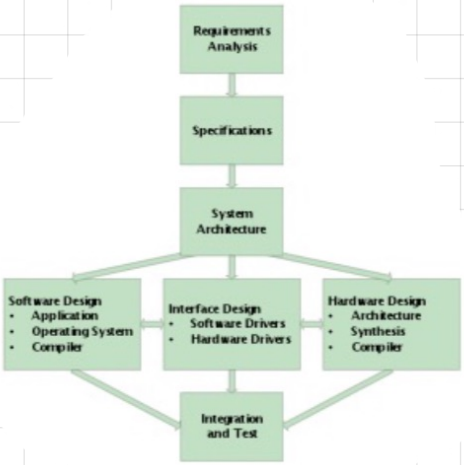



More flexible
Allows transitions
(though transitions can be costly)

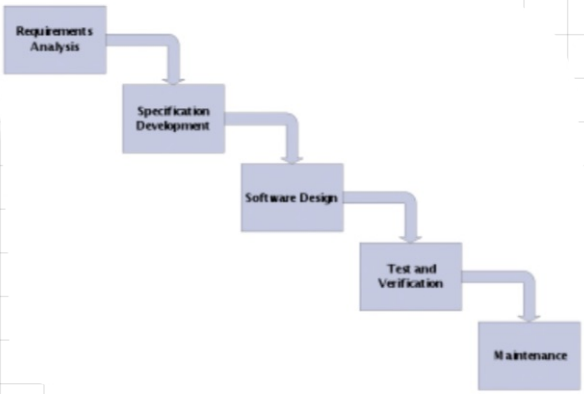
Elements of Design Process

Descriptive Flow Chart


VLSI




Embedded Systems




Software Development

Meeting w/ Mac: 09/15

Cindy Conte - Robert Conte Foundation 713 203 8880? FightPD @ RobertConteFoundation.org

Reason why $ is so high is b/c insurance (patients don't pay)

Parkinson's support groups

Embedded vs Software?

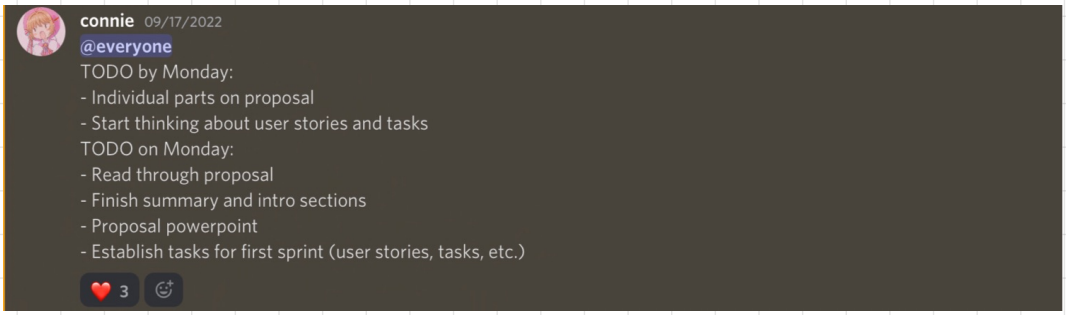
↑

more flexible

no QWERTY?

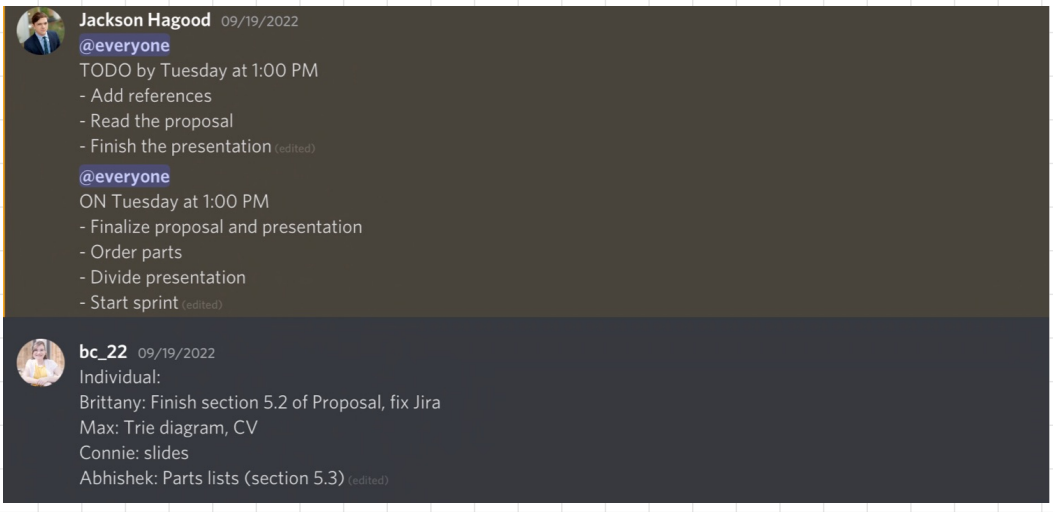
09/17: Team Meeting / Work Session

- Set up Jira Board & GitHub
- Created high-level block diagram
- Finished Design Specifications section of proposal




09/19: In-Class Work

- Split up tasks for proposal & presentation

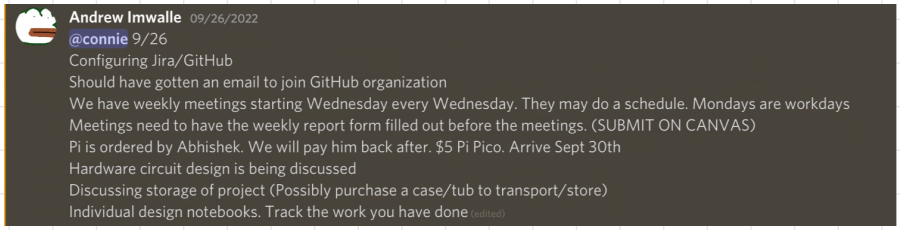


09/20: Team Sync

- Decided who will present which slides

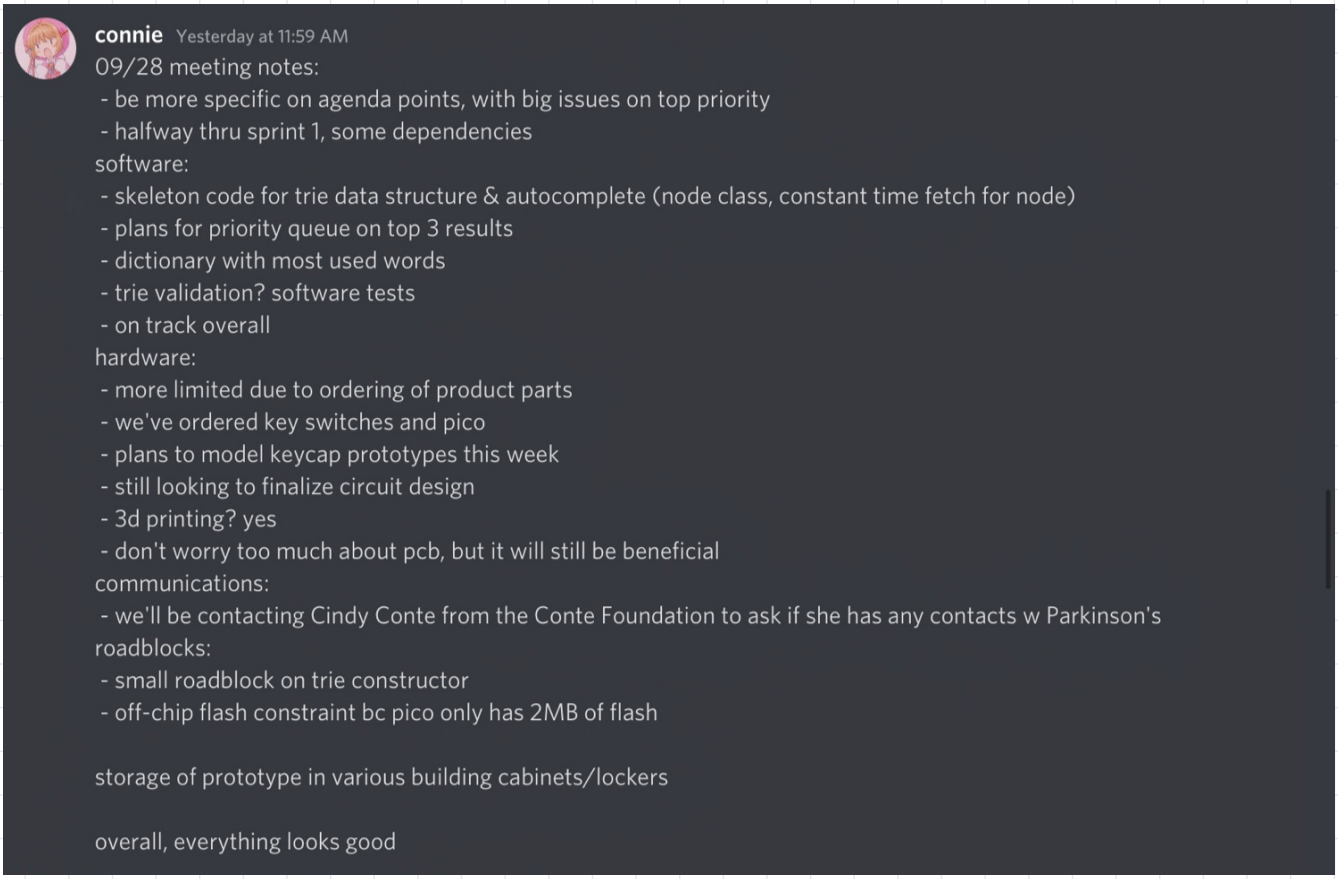
09/21: Team Proposal Presentation/Submission

09/26: Workday (Absent b/c sick)



**Andrew Imwalle** 09/26/2022
@connie 9/26
Configuring Jira/GitHub
Should have gotten an email to join GitHub organization
We have weekly meetings starting Wednesday every Wednesday. They may do a schedule. Mondays are workdays
Meetings need to have the weekly report form filled out before the meetings. (SUBMIT ON CANVAS)
Pi is ordered by Abhishek. We will pay him back after. $5 Pi Pico. Arrive Sept 30th
Hardware circuit design is being discussed
Discussing storage of project (Possibly purchase a case/tub to transport/store)
Individual design notebooks. Track the work you have done (edited)

09/28: Weekly Report #1 & Software algorithms discussion



**connie** Yesterday at 11:59 AM
09/28 meeting notes:
- be more specific on agenda points, with big issues on top priority
- halfway thru sprint 1, some dependencies

software:
- skeleton code for trie data structure & autocomplete (node class, constant time fetch for node)
- plans for priority queue on top 3 results
- dictionary with most used words
- trie validation? software tests
- on track overall

hardware:
- more limited due to ordering of product parts
- we've ordered key switches and pico
- plans to model keycap prototypes this week
- still looking to finalize circuit design
- 3d printing? yes
- don't worry too much about pcb, but it will still be beneficial

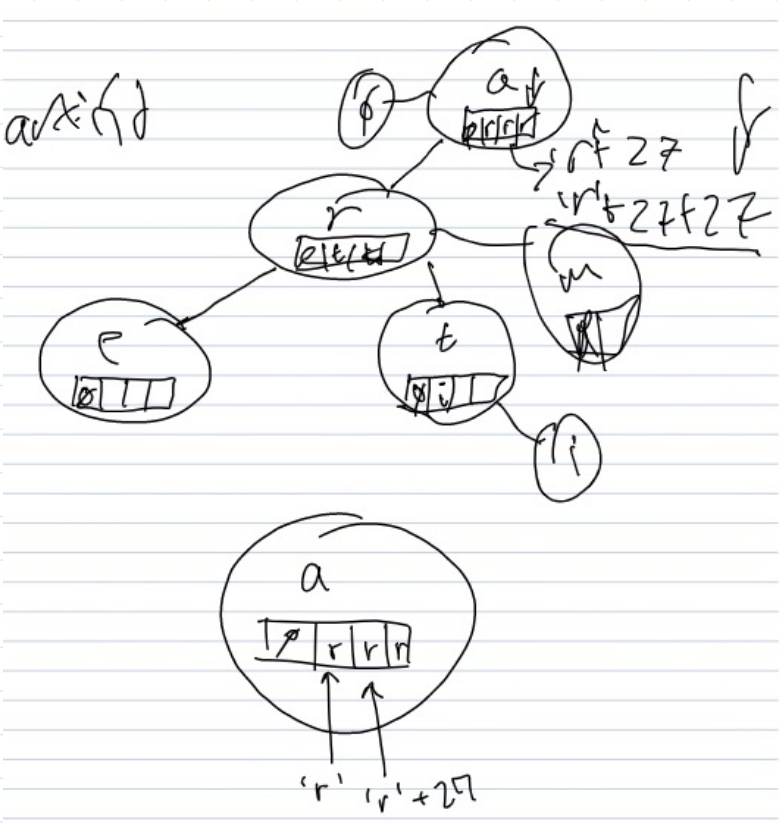
communications:
- we'll be contacting Cindy Conte from the Conte Foundation to ask if she has any contacts w Parkinson's

roadblocks:
- small roadblock on trie constructor
- off-chip flash constraint bc pico only has 2MB of flash

storage of prototype in various building cabinets/lockers

overall, everything looks good

Tric Structure:




10/03 Class Workday, Notes from Brittany:

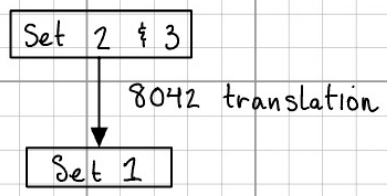
Using ASCII for our protocol (lower-case)

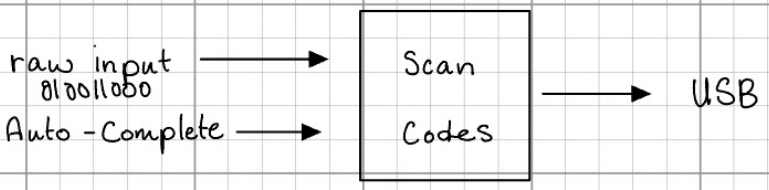
Character = key

| | | |
|---|---|---|
| Integer | 0-9 | |
| A-Z | 10-35 | (lower) |
| `/~ | 36 | |
| - | 37 | |
| = | 38 | |
| [ | 39 | |
| ] | 40 | |
| \| or \ | 41 | (pipe / backslash) |
| ; | 42 | |
| ' / " | 43 | |
| < | 44 | |
| > | 45 | |
| / | 46 | |
| SPACE | 47 | |
| TAB | 48 | |
| ENTER | 49 | |
| Backspace | 50 | |
| Delete | 51 | |
| Escape | 52 | |
| CAPS | 53 | |
| F1-F12 | 54-65 | |
| ↑ | 66 | |
| ↓ | 67 | |
| ← | 68 | |
| → | 69 | |
| M1 | 70 | |
| M2 | 71 | |
| M3 | 72 | |

Keyboard Scan Codes — Oct. 3, 2022

3 different sets




raw input → decoder → (MIR protocol) Compute → (convert to scancode) encode to USB → output

- decide what to do with characters (auto-complete)

Example:

AND

000 0000 0000 (&) 111 0000 0000

Special key (CRTL / ALT / SHIFT / WINDOWS)

**3a - CapsLock is an ordinary key**

- How does this work w/ auto-complete...
- Combination keys? (

0 0 0 0
↓ ↓ ↓ ↓
ALT CTRL SHIFT WINDOWS

1000 - ALT
0100 - CTRL
0010 - SHIFT
0001 - WINDOWS



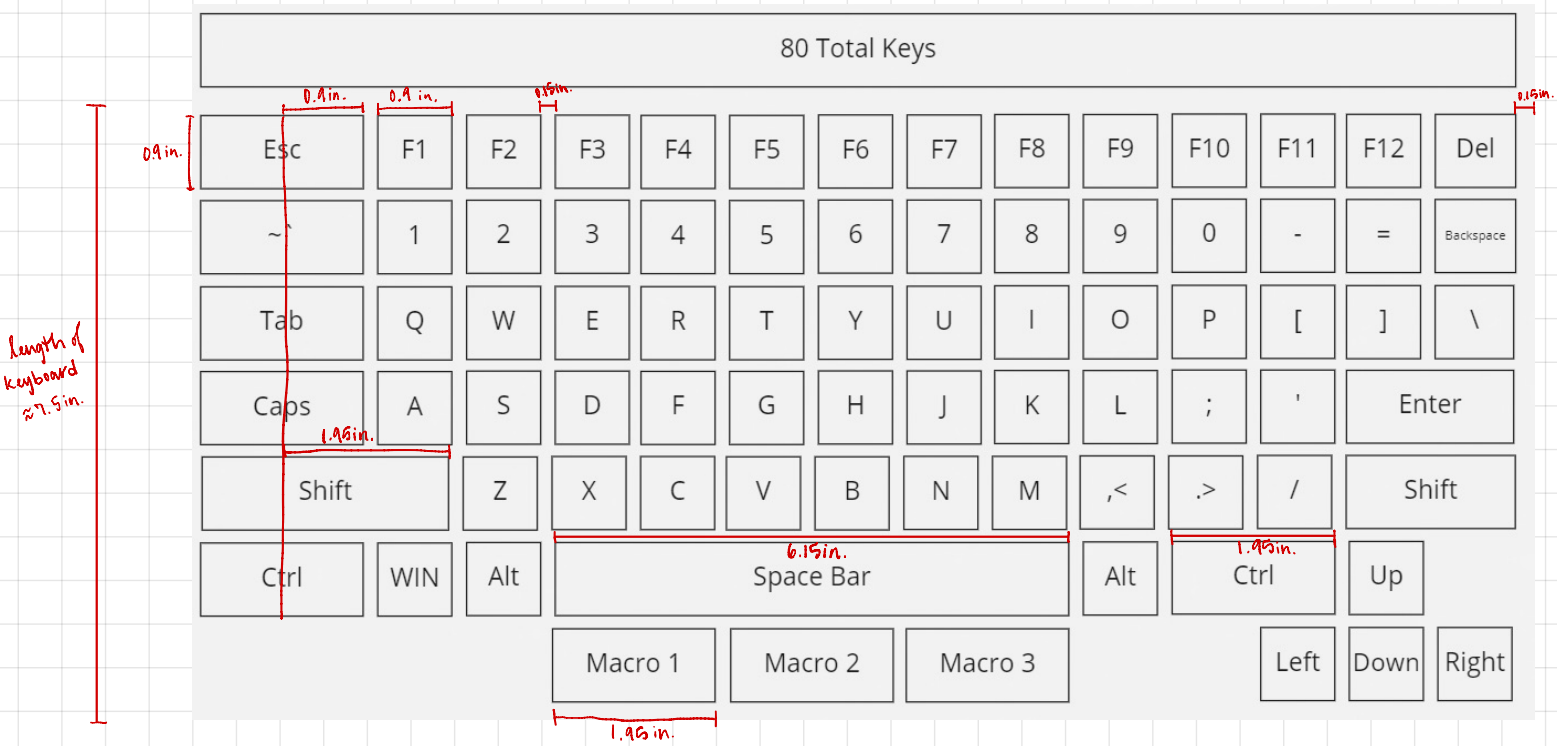
- (78 keys) → 11 bits / 2 bytes
  → round to 12 bits, some wasted space
  → unsigned short (2 bytes)

10/15 Hardware Meeting

Met w/ Andrew & Max to make progress on hardware before CDR
Ran into issues w/ Pico set-up

☆ There was a meeting on 10/23 where a lot of progress was made, but I couldn't make it to that meeting due to another conflict

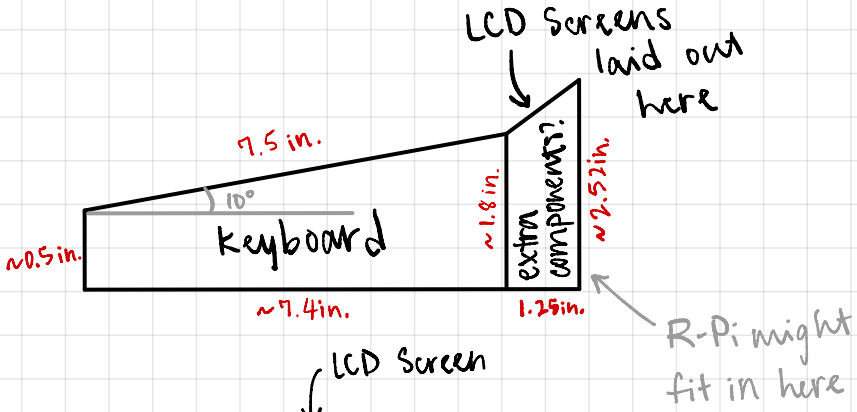
# Dimensions Calculations

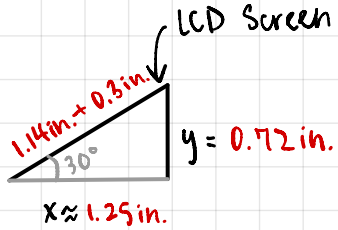



Height of switch + keycap: 0.5625 inches

PCB Footprint is 15mm x 15mm

Side View:



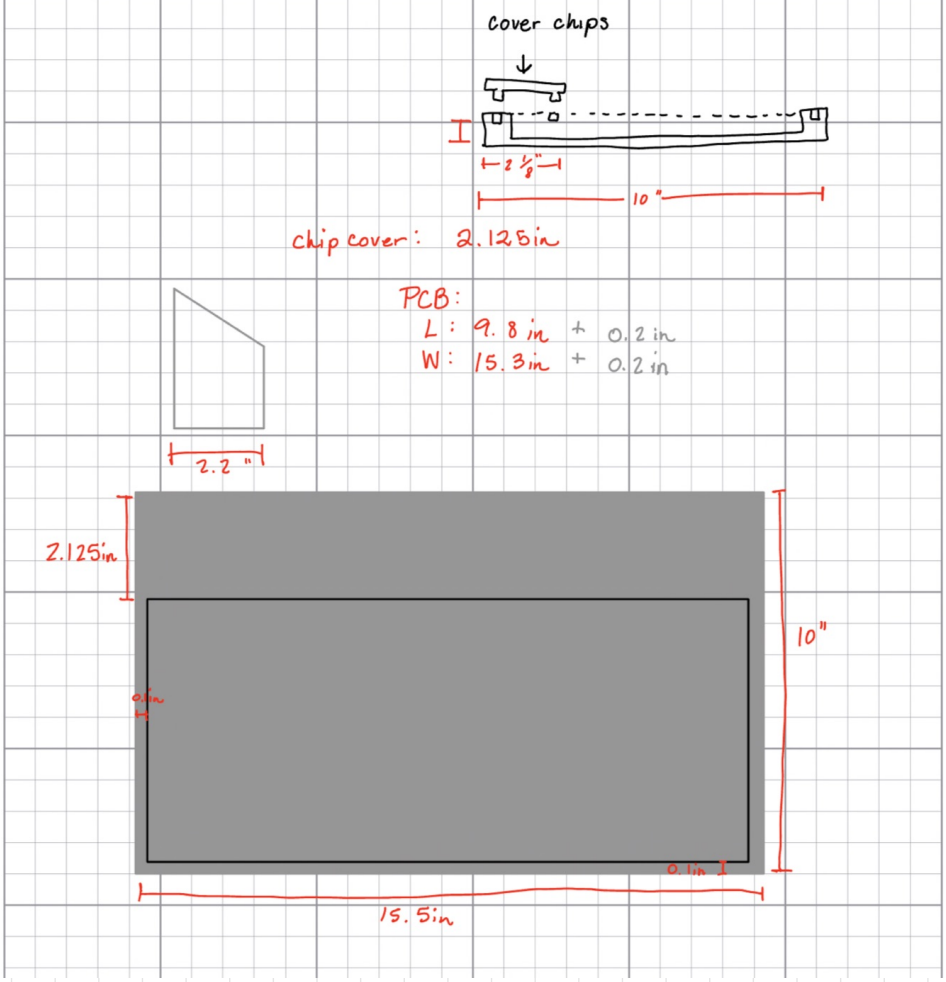



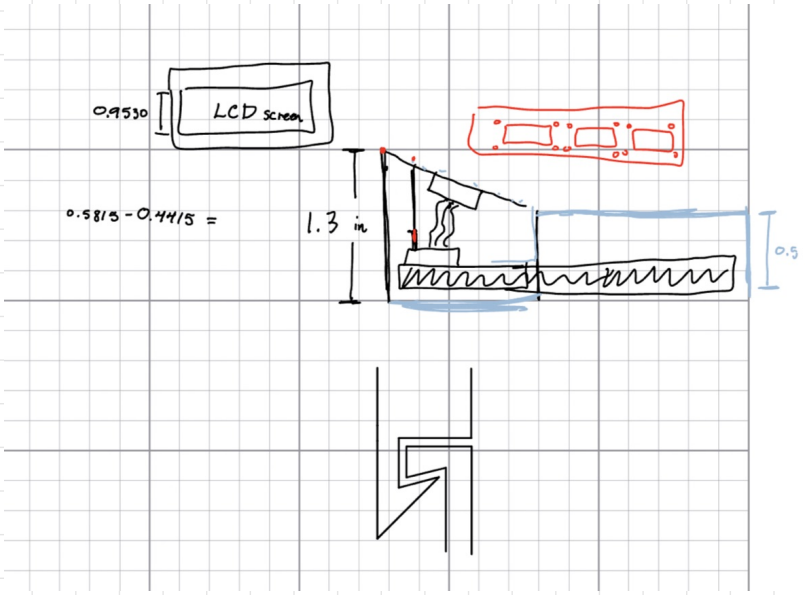

Total length: 8.65 in.
Total width: 14.85 in.
Height: 2.52 in.

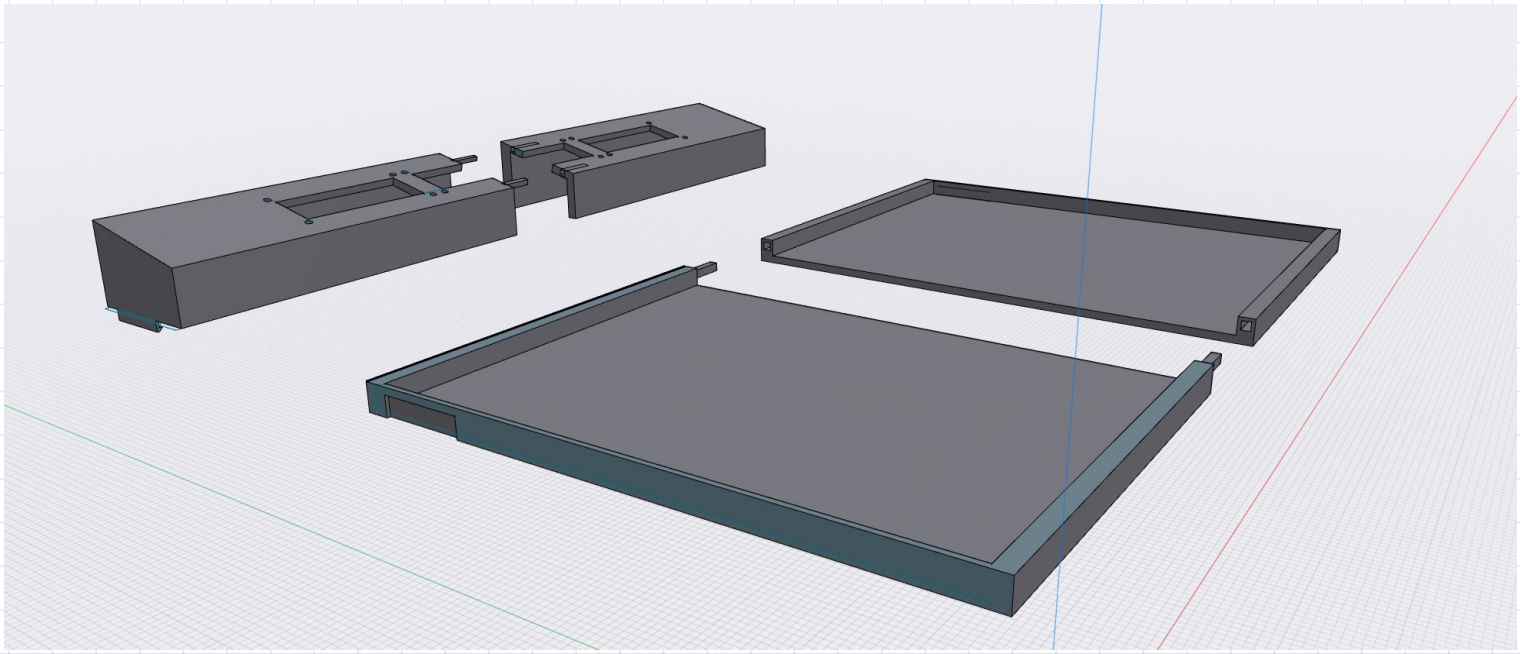
# Housing Model Development (w/ Brittany):

Modelling Housing — Nov. 27, 2022

- How wide do the walls need to be to be structurally sound
- measure PCB





↑
Final housing models

The hook/clasp mechanisms didn't work but that's OK
↳ replaced w/ electrical tape