

# **EE322: Embedded Systems Design - Project**

Coin Sorter and Calculator

Project Progress Report 1

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Group : G1

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## Coin Sorter and Calculator

### Progress From 07/06/2021 to 09/07/2021

Overall percentage progress

0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
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### Introduction

This report covers the progress of this project for the period from 07/06/2021 to 09/07/2021 is discussed. Since this period also includes the initiation of the project, there is no prior progress to report on. During this time, the team took numerous meetings to discuss the project and work on the required documents, as well as gather some of the required apparatus. Majority of the discussions were done via Google Meet while using Google Jamboard to collaboratively brainstorm and present ideas.

### Progress for the period from 07/06/2021 to 09/07/2021

#### 07/06/2021

The project commenced during the EE322 Embedded Systems lecture. Within the same day, a WhatsApp group was created for communication between project members, and the project was registered at the relevant FEeLS page under Group G1. Project ideas were presented and discussed with the intention of finalizing a theme by the next meeting.

#### 08/06/2021

##### Meeting 01: 2000h - 2100h

During the first meeting, the following ideas were put together in order to get an approach for the project proposal.

- Coin calculator using weight/vending machine
- Level Meter / Bar Graph
- Temperature control system with fan
- Password based door lock
- Timer/alarm clock - using DS3231 RTC module

Then, collaboration work was done using Google Jamboard. A Google Drive folder was set up to collect all the materials regarding the project.

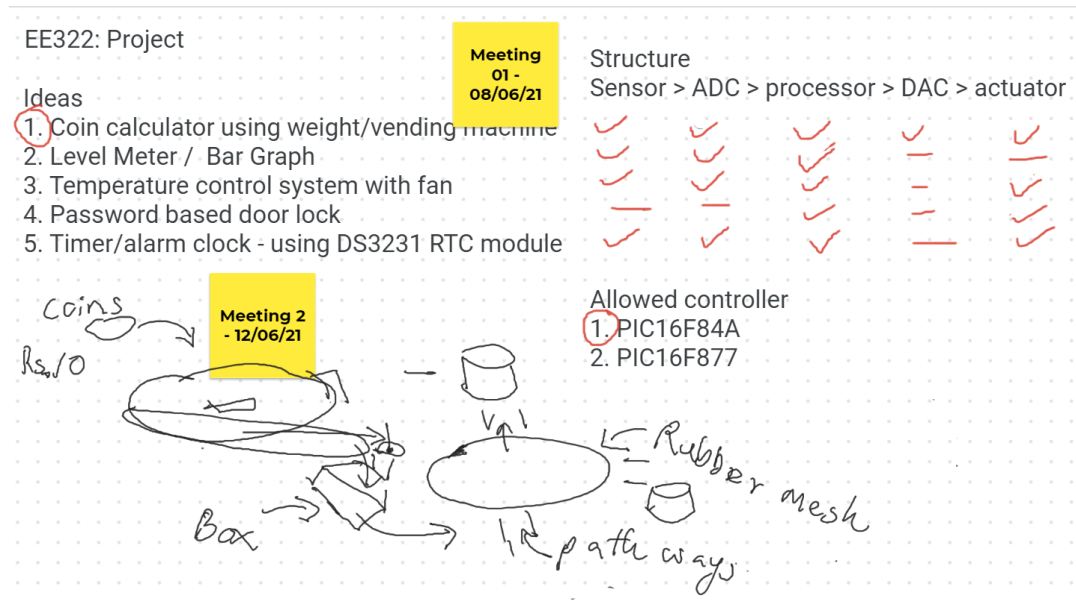


Figure 01: Jamboard session from meeting 01 and 02

12/06/2021

### Meeting 02: 1700h - 1900h

All the members agreed on the project idea of a Coin sorter and a calculator. Along with that, mechanisms used in the project were confirmed. The process and component connectivity was also discussed during the meeting.

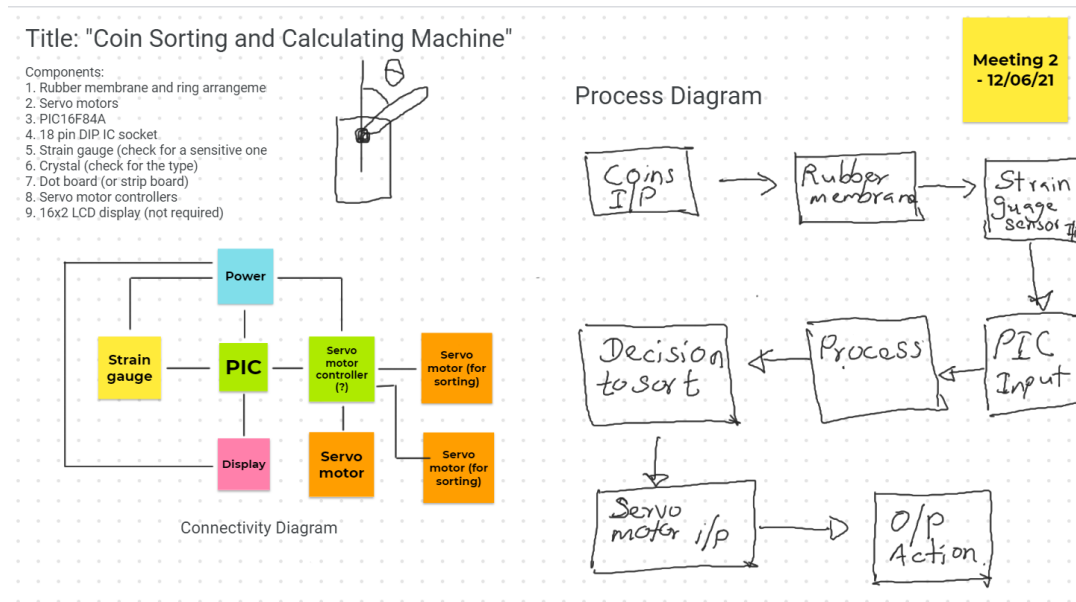
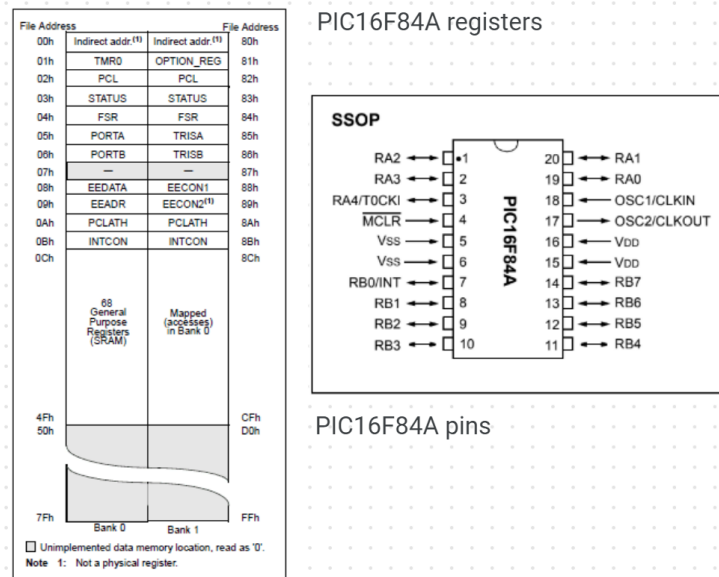
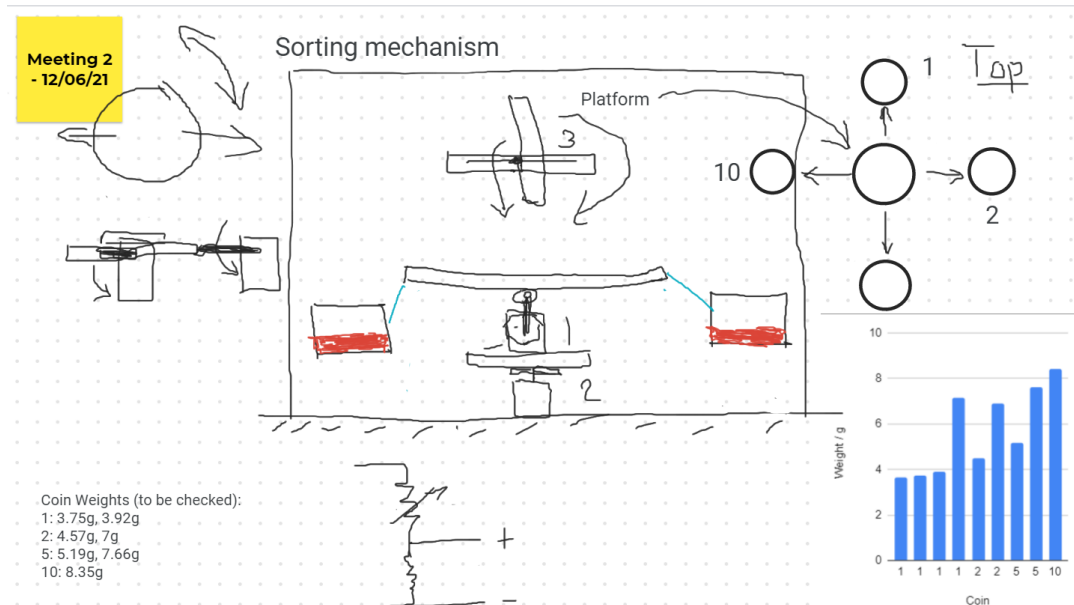


Figure 02: Jamboard session from meeting 02



**Figure 03: Jamboard session from meeting 02 continued**



**Figure 04: Jamboard session from meeting 02 continued**

**15/06/2021**

### Meeting 03: 1700h - 1900h

At this meeting, methods for identifying different coins were discussed. In order to get an understanding of the weightage of coins of different currency values, namely Rs. 1, Rs. 2, Rs. 5, and Rs. 10, the weight of each coin was measured using a jewellery scale one of the members had at home. Furthermore, a sensing mechanism for detecting coins and viable sensors were discussed.

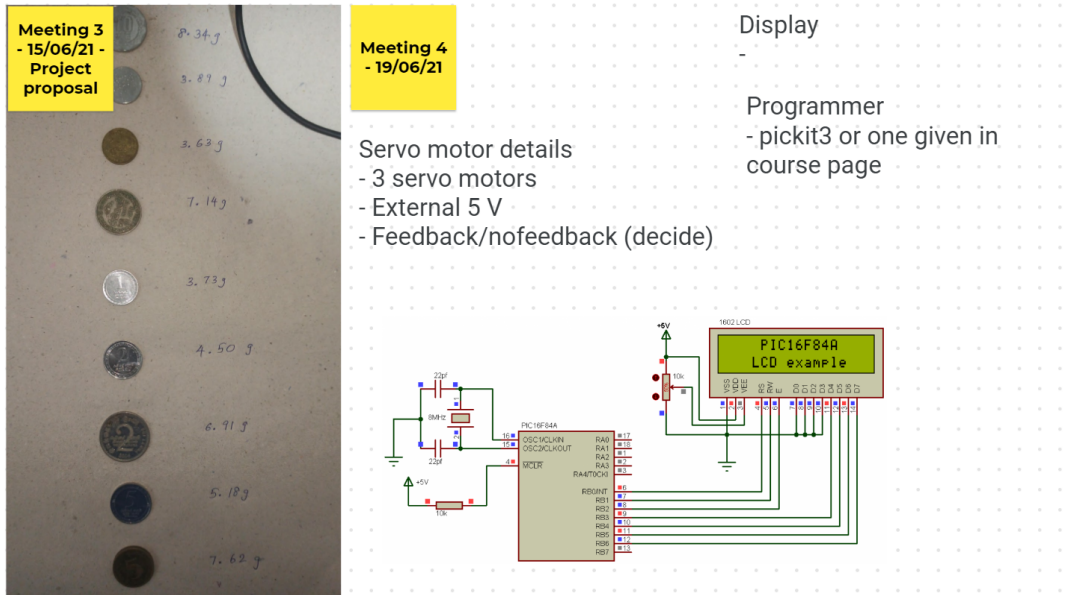


Figure 05: Jamboard session from meeting 03 and 04

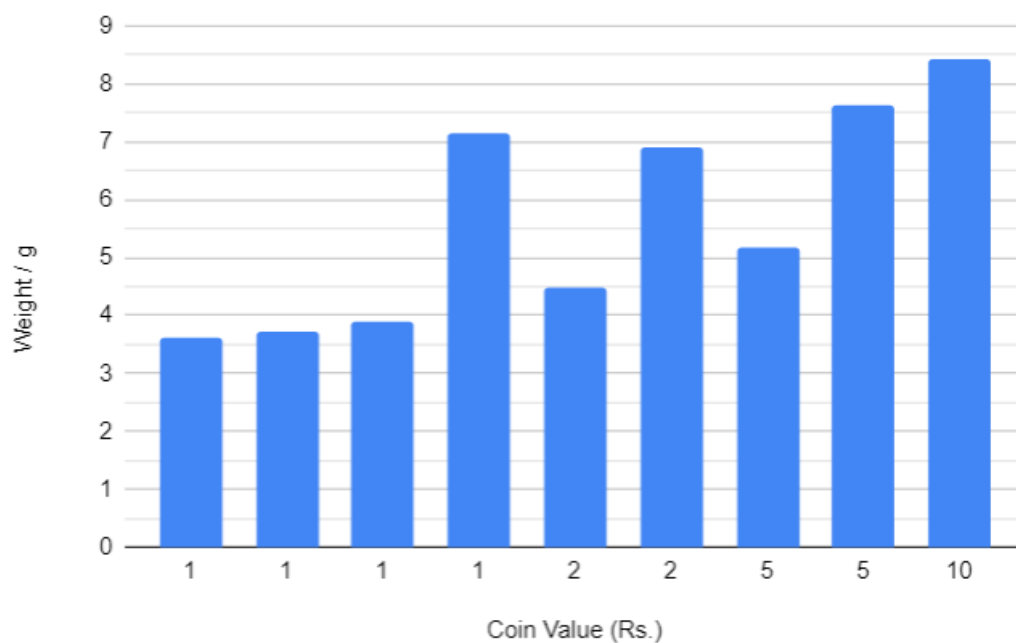


Figure 06: Measured weights of each type of coin

**19/06/2021**

Meeting 04: 1700h - 1900h

During this meeting components required for the project were discussed and the displaying options were potentially evaluated. Based on that, the number of sufficient input pins were finalised.

23/06/2021

Meeting 05: 2100h - 2215h

The project proposal was prepared collaboratively through Google Docs. Also, a load cell (strain gauge sensor integrated) was found on the same day. During the discussion, the original idea of a coin calculator and a sorter was extended for a coin exchanger. A discussion was held on how different combinations of coins add to a given amount.

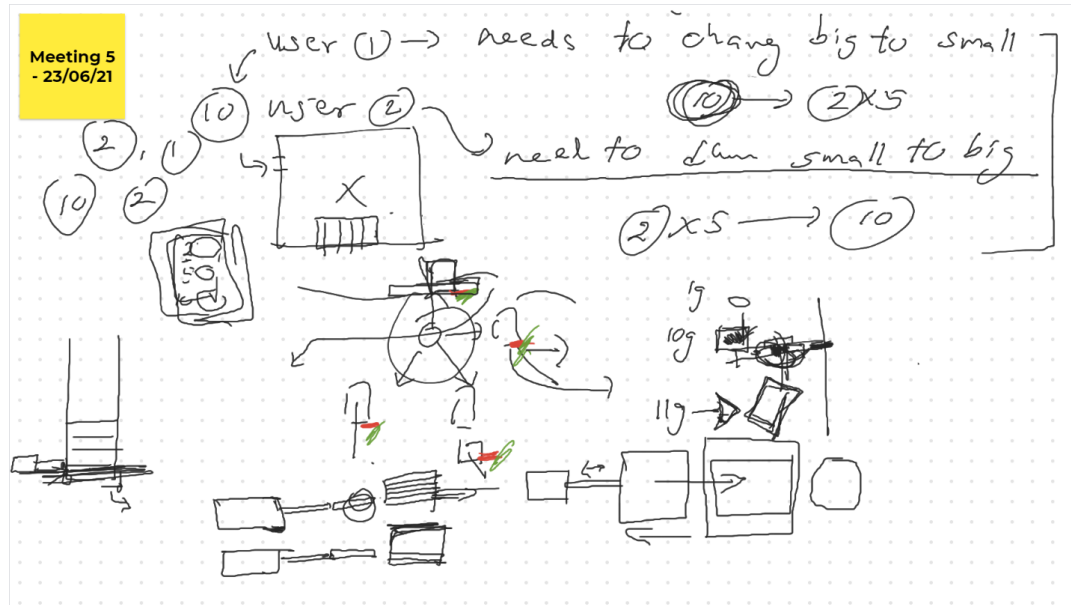


Figure 07: Jamboard session from meeting 05

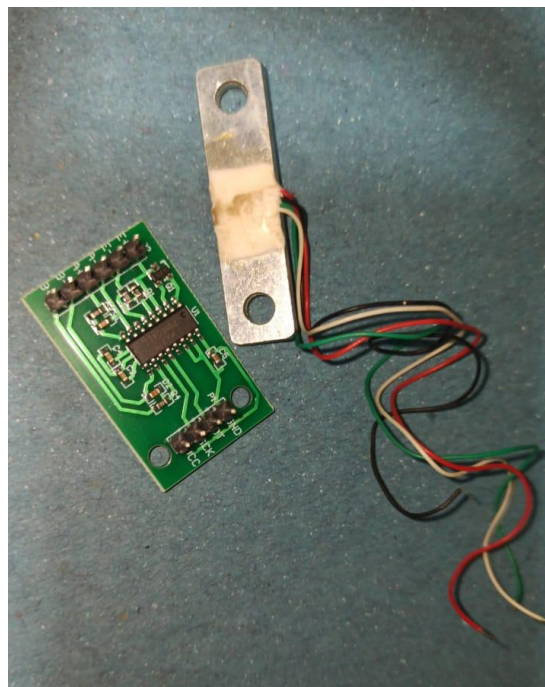


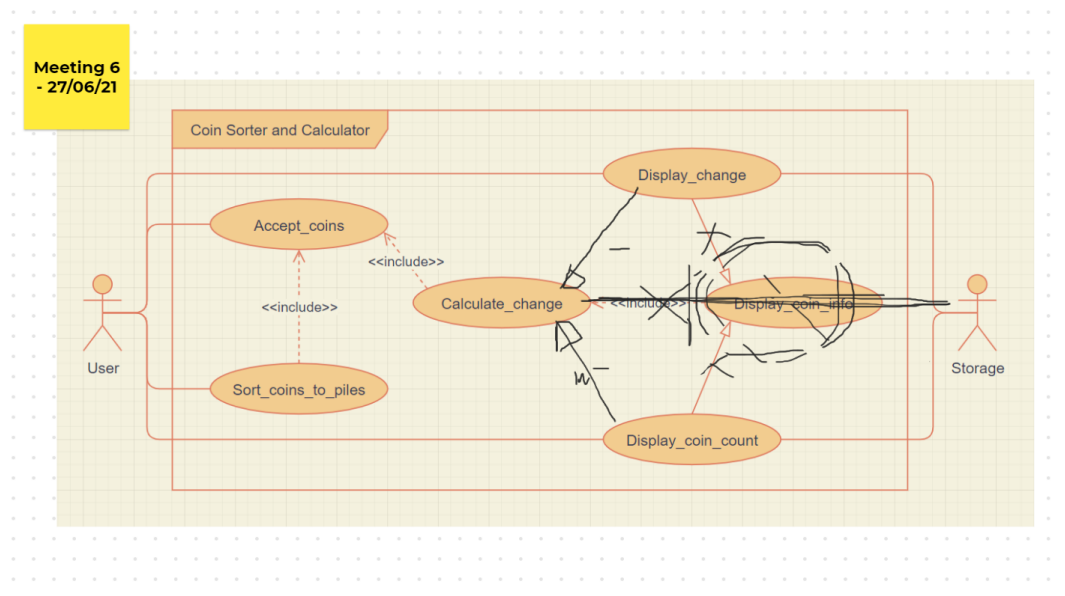


Figure 08: Load Cell and the ADC Module**24/06/2021**

The project proposal was submitted to FEeLS at 1324h.

**27/06/2021**Meeting 06: 2200h - 2315h

At this meeting, the use case diagram for the proposed device was finalized. In addition, a discussion was carried out on the idea of the addition of a storage unit as an extension to the device. Specifically, it was suggested to use the 8-pin serial EEPROM 24CO2N as an external storage.

Figure 09: Jamboard session from meeting 06**28/06/2021**

The use case diagram of the device was submitted to FEeLS at 0730h.

**03/06/2021**Meeting 07: 1745h - 2000h

Drafts for the class diagram and the program structure were prepared during this meeting. The class diagram was completed and was submitted to FEeLS upon the conclusion of the meeting at 2200h.

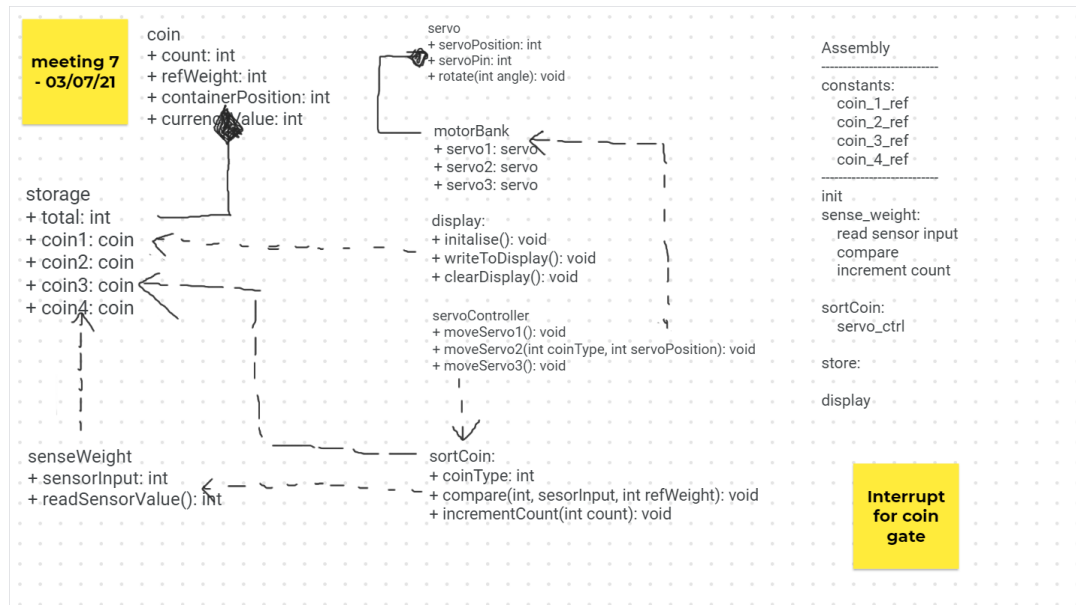


Figure 10: Jamboard session from meeting 07

**06/07/2021**

The PIC16F84A microcontroller required for the project and PICkit3 programmer required for programming the microcontroller were purchased from tronic.lk.

**07/07/2021**

Meeting 08: 1700h - 1915h

During this meeting, the progress report 1 (this document) for the project was drafted. In addition, the preparation of the sequence diagram for the project was commenced.

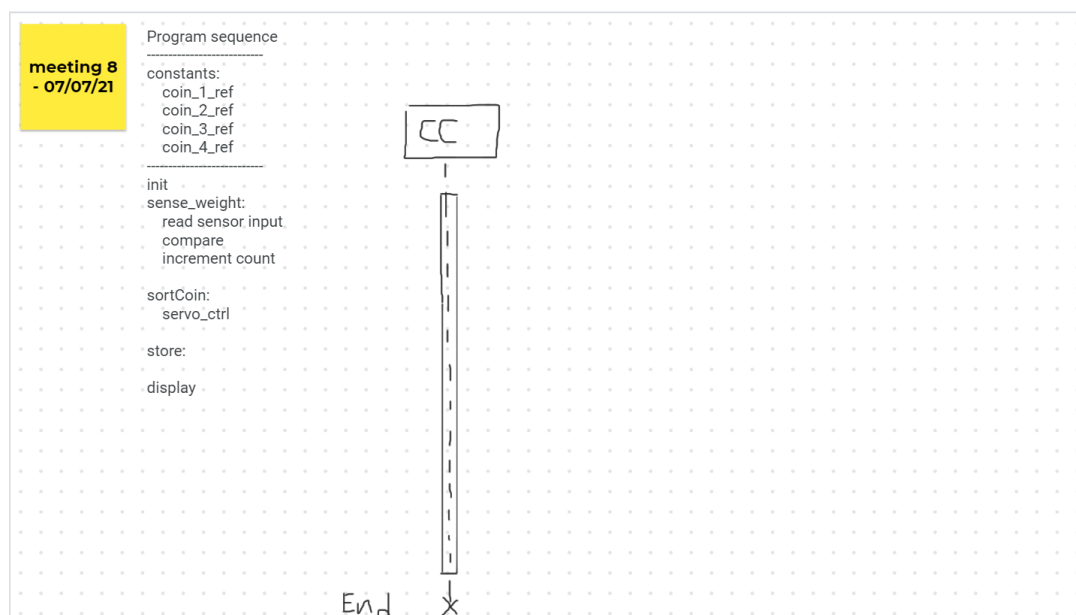


Figure 11: Jamboard session from meeting 10

**09/07/2021**

Meeting 09: 1700h - 1915h

During this meeting, the progress report 1 (this document) for the project was finalized.

## Cost Analysis

The cost analysis for the period between 07/06/2021 to 09/07/2021 is given in Table 01.

Table 01: Cost analysis for the period between 07/06/2021 to 09/07/2021

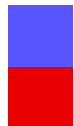
<b>Task</b>	<b>Budgeted cost (Rs.)</b>	<b>Expenses from 07/06/2021 to 09/07/2021 (Rs.)</b>	<b>Comments</b>
<b>Purchases</b>			
PICkit 3 Microchip Programmer	-	2650.00	The initial plan was to build a DIY PIC programmer. However, due to increasing workloads and lack of time, it was decided to purchase a prebuilt programmer.
PIC16F84A	600.00	610.00	
Load cell	950.00	950.00	
<b>Framework</b>			
0.47 mm steel sheet shaping		100.00	
<b>Total</b>		<b>4310.00</b>	

### Timeline: Planned vs. Actual

A comparison between the planned execution time and the actual execution time of each task that was proposed in our project proposal is given in Table 02.

Table 02: Timeline: Planned vs. actual

	Activity	2021											
		June				July				August			
1.	Project start and submission of the proposal												
2.	Analysis and designing												
3.	Simulation												
4.	Hardware implementation												
5.	Report writing and project completion												



Planned execution time of the task as of the initial proposal

Actual execution time of the task due to delays etc.