# REAL-TIME CARBON NEUTRALITY MANAGEMENT AND OPTIMIZATION USING NATURAL LANGUAGE PROCESSING

Project Id: 2022-175

Status Document 1

B.Sc. (Hons) Degree in Information Technology

Department of Information Technology

Sri Lanka Institute of Information Technology

Sri Lanka

13th May 2022

SUPERVISOR'S DETAILS:

| SUPERVISOR | CO-SUPERVISOR |
|---|---|
| Ms. Anjali Gamage | Ms. Sanjeevi Chandrasiri |

PROJECT MEMBER DETAILS:

| | STUDENT NAME | STUDENT NO | CONTACT NO | EMAIL ADDRESS |
|---|---|---|---|---|
| 1 | M MATHANIKA | IT19005218 | 0766351696 | it19005218@my.sliit.lk |

# Contents

# TABLE OF FIGURES

# 1. GitLab
## 1. Project



*Figure 1: Our Project View in GitLab*

## 2. Members



*Figure 2: Member details*

3. Individual Commit statistics
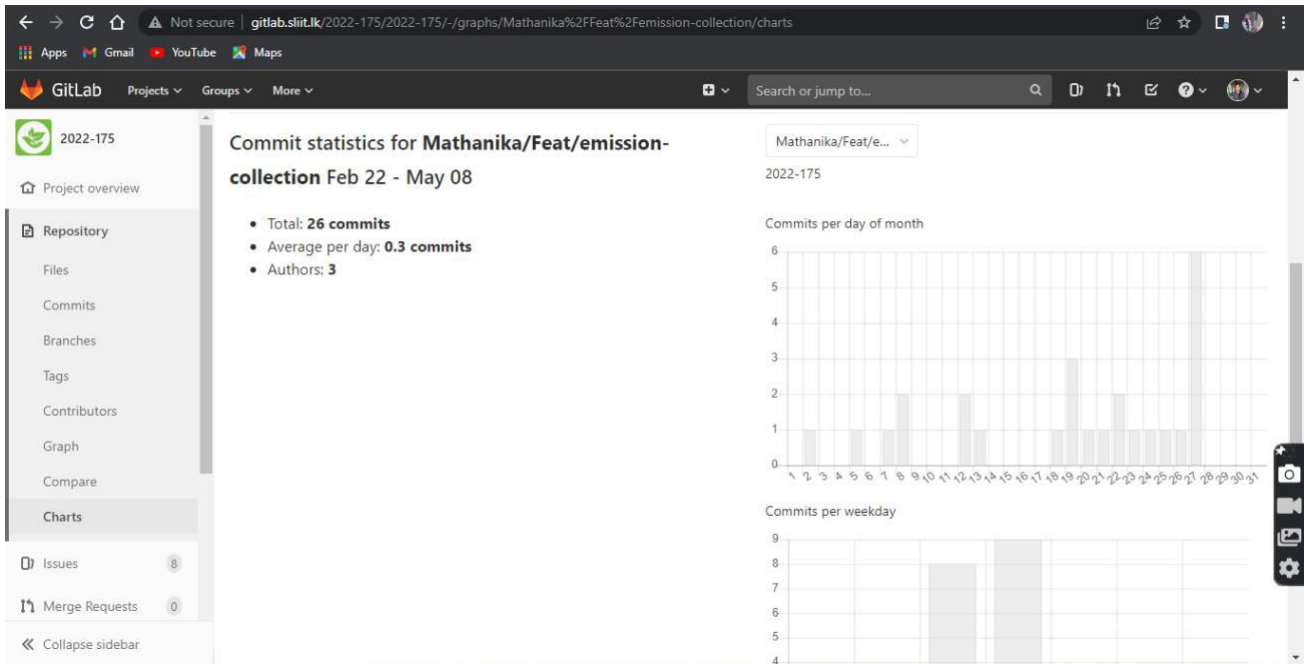


*Figure 3: Individual Commit statistic proof*

4. Individual commit Heatmap
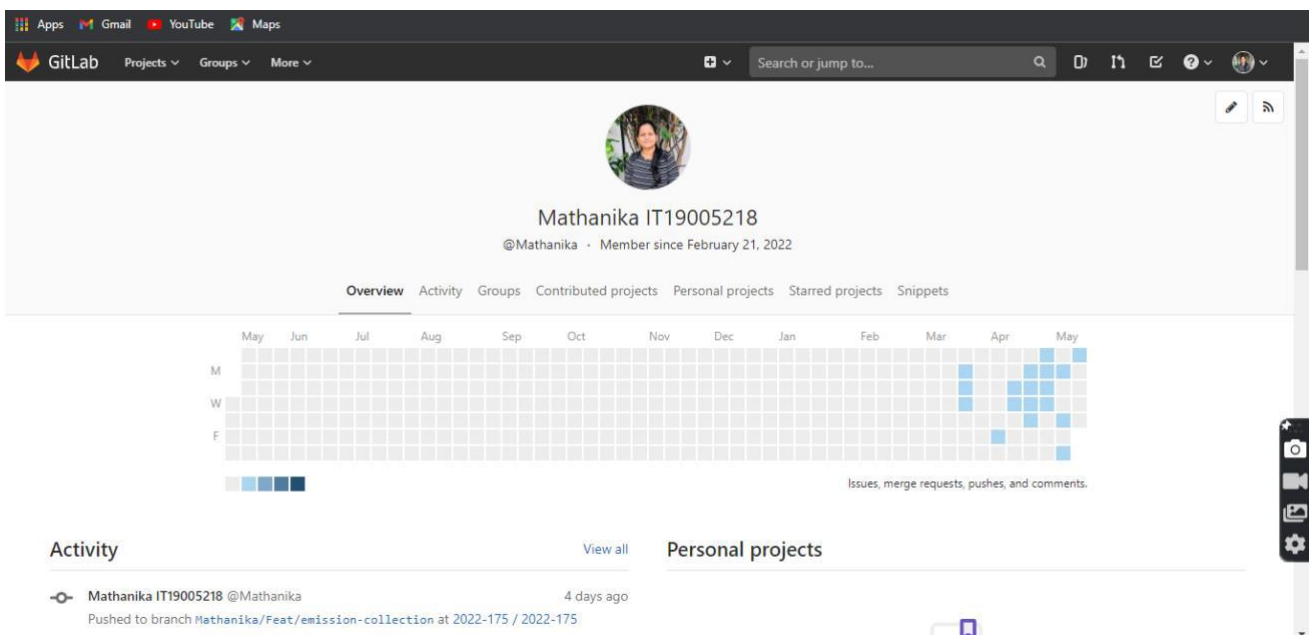


*Figure 4: Individual heat map proof*

## 2. Project Management Tools and Reports
### 1. Supervisor meeting schedules
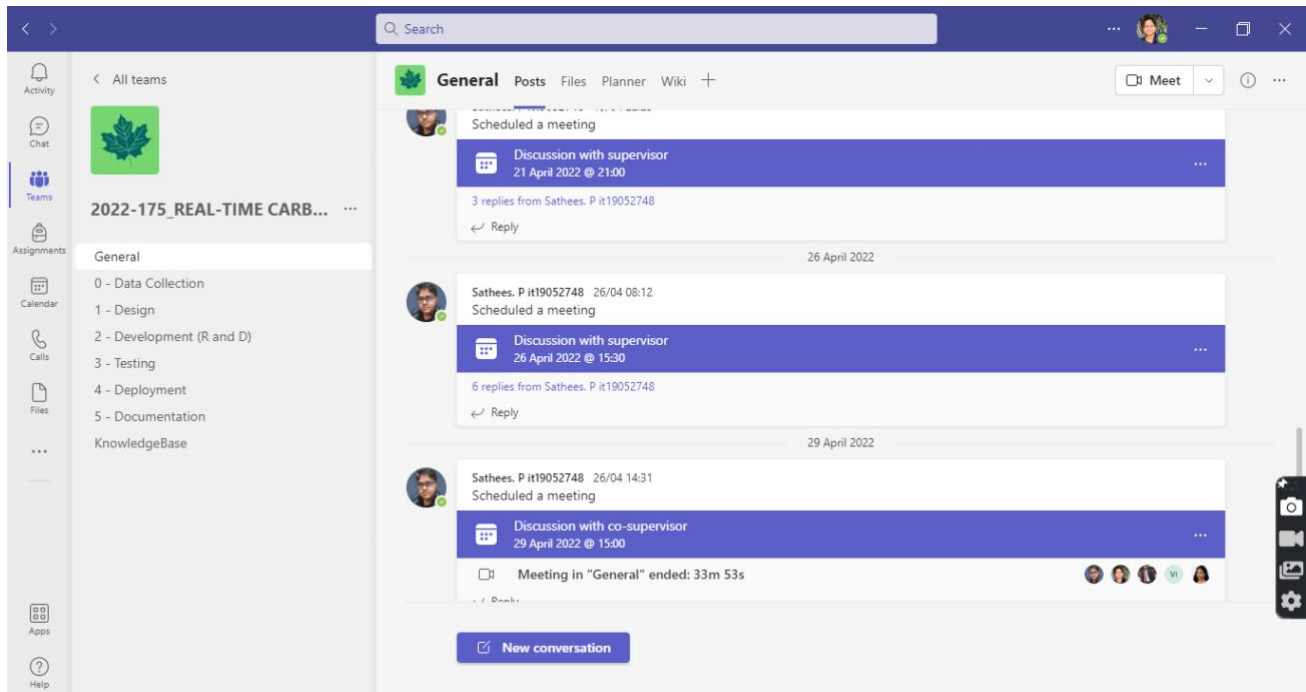


*Figure 5: Supervisors meeting scheduled proofs*
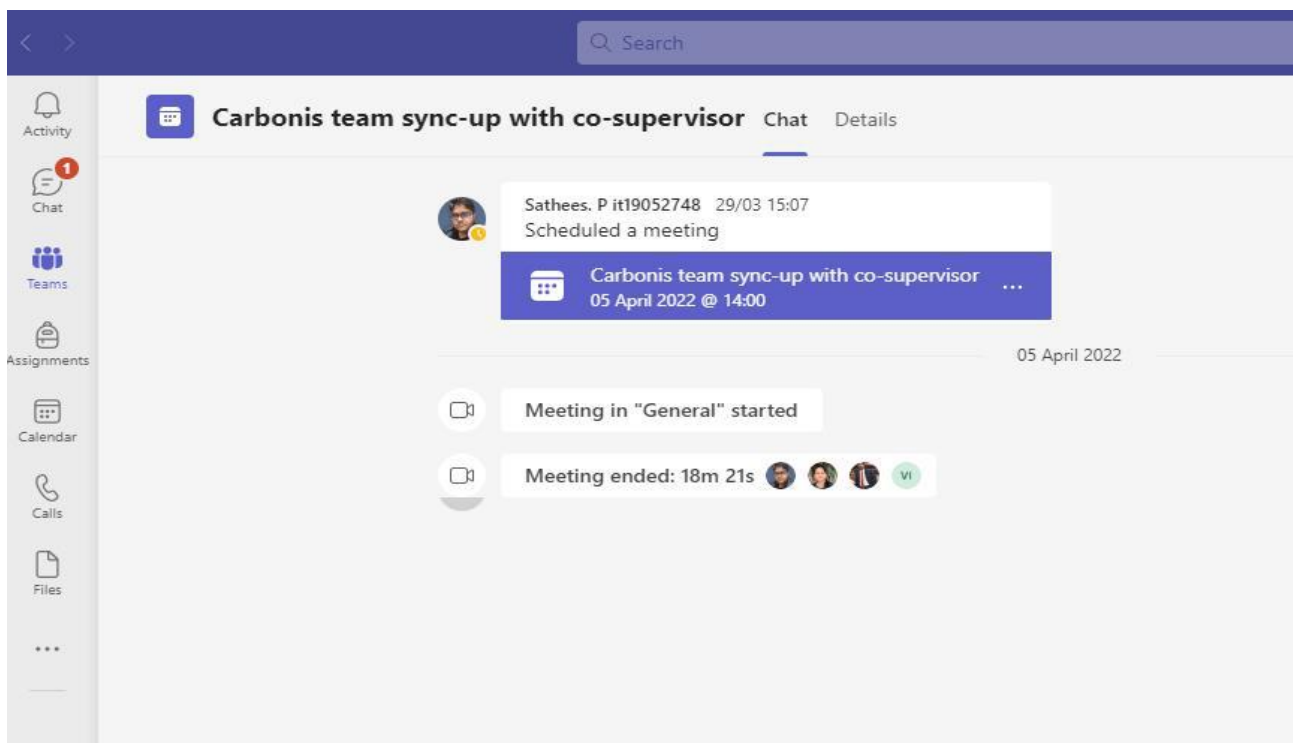


*Figure 6: Meeting with Co-Supervisor Proof*
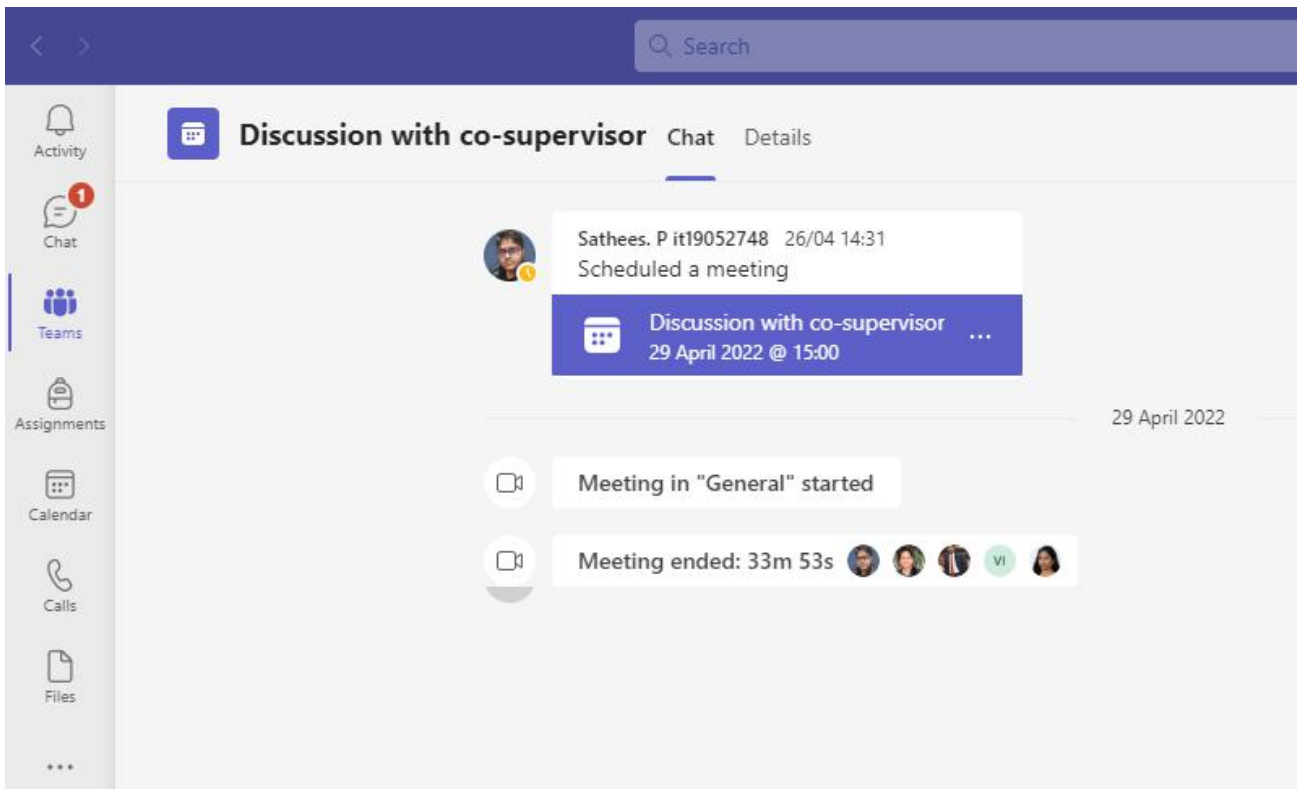
*Figure 7: Meeting with Co-Supervisor Proof*
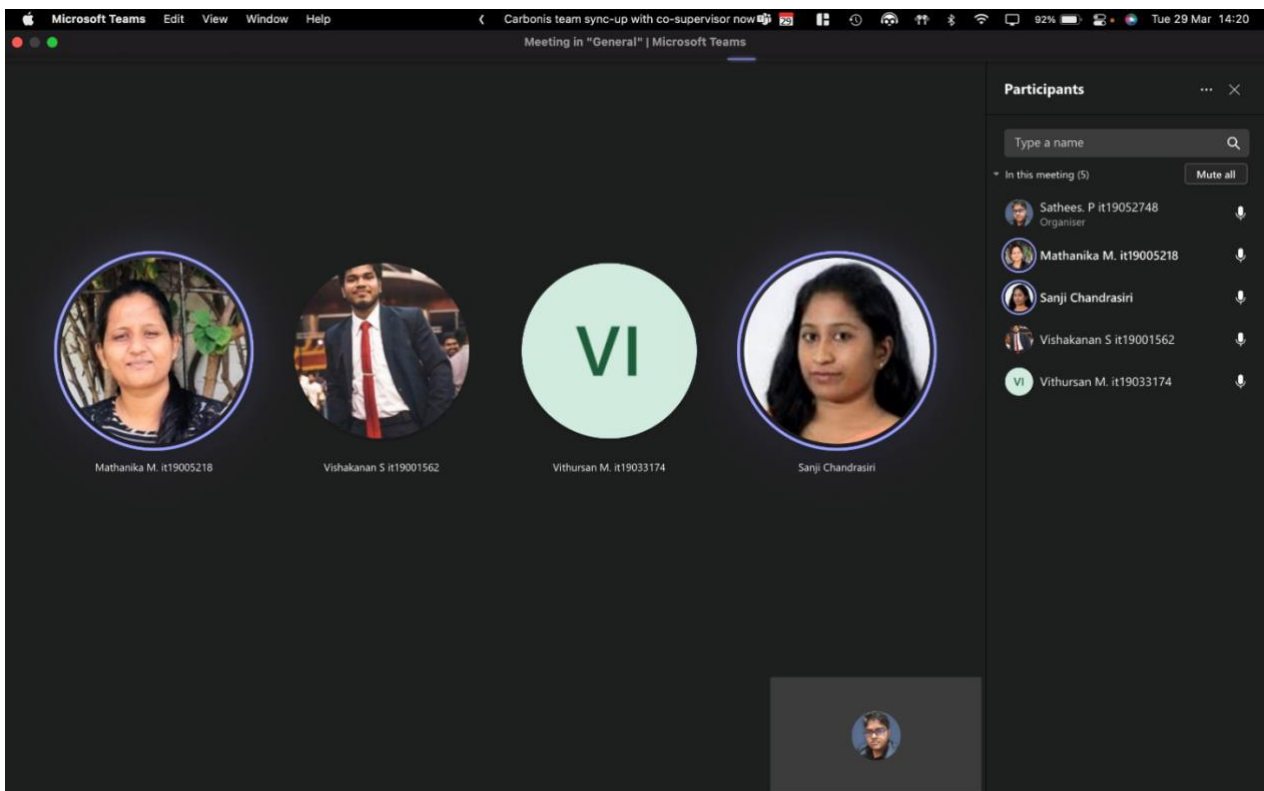


*Figure 8: Meeting Proof*

2. Team Member's Meetings schedule
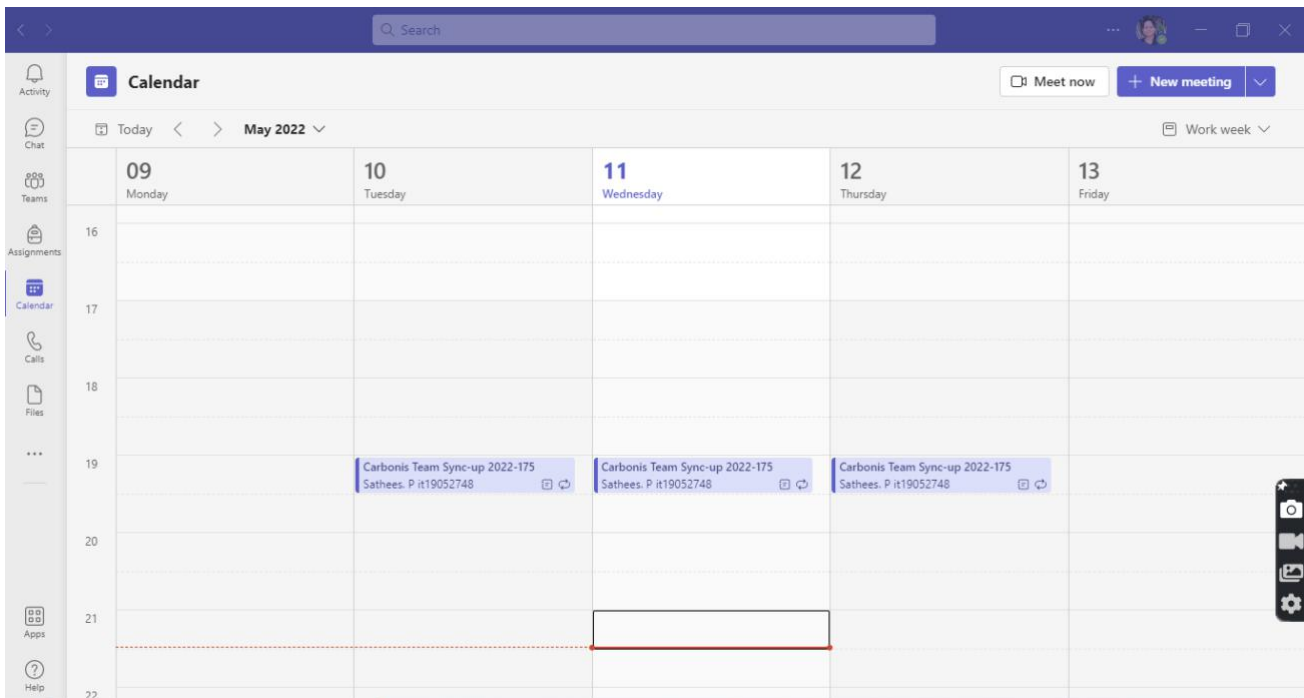


*Figure 9: Team members Meeting scheduled proof*

3. Team's Conversations
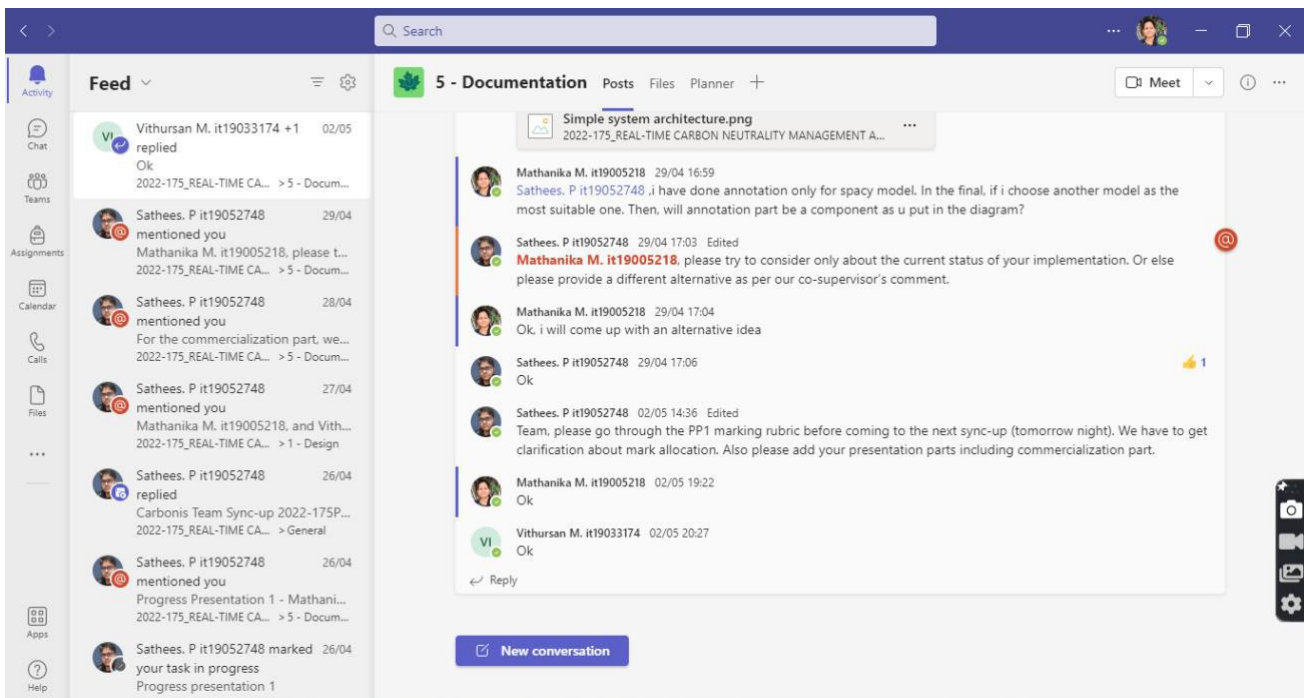


*Figure 10: Team's Conversation proof*

## 3. Individual Meeting History and proofs

| Date | Time | Platform | Mathanika | Discussions | Conclusions |
|---|---|---|---|---|---|
| 20/11/2021 | 8:00 PM | Zoom | Present | Component seperation, supervisor selection | Chosen topic 1 as the priority idea Started working on component separation |
| 21/11/2021 | 1:00 PM | Zoom | Present | Absent | |
| 22/11/2021 | 1:00 PM | Zoom | Present | Finalize supervisor document Send mail to supervisor Responsive and informing prior Journal task allocation | |
| 23/11/2021 | 8:00 AM | Zoom | Present | Informing prior about attendance Meeting time (to morning) Slack usage | |
| 24/11/2021 | 8:00 AM | Zoom | Present | Present | |
| 29/11/2021 | 10:00 AM | Zoom | Present | Identify unique research components Allocate sections | Decided to research about each sections |
| 01/12/2021 | 8:00 AM | Zoom | Present | Research component search progress Supervisor issue | Decided to mail the supervisor for a meet this Friday |

*Figure 11: Team meeting individual proof 1*

| Date | Time | Platform | Mathanika | Discussions | Conclusions |
|---|---|---|---|---|---|
| 02/12/2021 | 8:00 AM | Zoom | Present | New component separation Component allocation Courses System diagram Allocation of the time title submission form | Decided to send a mail to supervisor requesting a meeting |
| 03/12/2021 | 5:00 PM | Zoom | Present | Mail sent Tasks identified | |
| 05/12/2021 | 8:00 AM | Zoom | Present | Tasks identified Supervisor status Form submissions | Decided to send a remainder mail to supervisor for topic selection, supervising, and co-supervisor. Decided to conduct meetings everyday from now. |
| 06/12/2021 | 8:00 AM | Zoom | Present | Supervisor issue Dataset issue Sending a third mail | Decided ask for new supervisor |
| 06/12/2021 | 9:00 PM | Zoom | Present | Data and Topic issue Send mail to Dilani and Pradeepa miss | Sent mails to supervisors |
| 07/12/2021 | 8:00 AM | Zoom | Present | Updates on mails Data science technologies | |

*Figure 12: Team meeting individual proof 2*

| | Date | Time | Platform | Mathanika | Discussions | Conclusions |
|---|---|---|---|---|---|---|
| 15 | 07/12/2021 | 9:00 PM | Zoom | Present | Topic selection<br>Co-supervisor selection<br>Components<br>Communications with supervisor (e.g. teams)<br>External supervisor | Identify more relevant components for this bee idea<br>Find a more novel idea |
| 16 | 08/12/2021 | 8:00 AM | Zoom | Present | New idea formation<br>Co-supervisor<br>More resources for 1st idea | Decided to send documents of new idea to supervisor<br>Asked for a co-supervisor |
| 17 | 09/12/2021 | 8:00 AM | Zoom | Present | New components to the new idea<br>Co-supervision from Dharshana sir | Sent a request to Dharshana sir |
| 18 | 09/12/2021 | 8:00 PM | Zoom | Present | Arranging new meet with supervisor<br>Concept of bee idea | Wait for co-supervisor meeting |
| 19 | 10/12/2021 | 8:00 PM | Zoom | Present | New ideas<br>Feasibility of the ideas<br>What to ask with co-supervisor | Decided to ask for a schedule with co-supervisor |
| 20 | 11/12/2021 | 8:00 AM | Zoom | Absent | What to discuss with co-supervisor<br>Any new ideas | Go with the second idea |
| 21 | 11/12/2021 | 8:00 PM | Zoom | Present | Identify topics<br>Product name | |
| 22 | 12/12/2021 | 8:00 AM | Zoom | Present | Forming topic<br>Submitting the topic | |

*Figure 13: Team meeting individual proof 3*

| | Date | Time | Platform | Mathanika | Discussions | Conclusions |
|---|---|---|---|---|---|---|
| 15 | 07/12/2021 | 9:00 PM | Zoom | Present | Topic selection<br>Co-supervisor selection<br>Components<br>Communications with supervisor (e.g. teams)<br>External supervisor | Identify more relevant components for this bee idea<br>Find a more novel idea |
| 16 | 08/12/2021 | 8:00 AM | Zoom | Present | New idea formation<br>Co-supervisor<br>More resources for 1st idea | Decided to send documents of new idea to supervisor<br>Asked for a co-supervisor |
| 17 | 09/12/2021 | 8:00 AM | Zoom | Present | New components to the new idea<br>Co-supervision from Dharshana sir | Sent a request to Dharshana sir |
| 18 | 09/12/2021 | 8:00 PM | Zoom | Present | Arranging new meet with supervisor<br>Concept of bee idea | Wait for co-supervisor meeting |
| 19 | 10/12/2021 | 8:00 PM | Zoom | Present | New ideas<br>Feasibility of the ideas<br>What to ask with co-supervisor | Decided to ask for a schedule with co-supervisor |
| 20 | 11/12/2021 | 8:00 AM | Zoom | Absent | What to discuss with co-supervisor<br>Any new ideas | Go with the second idea |
| 21 | 11/12/2021 | 8:00 PM | Zoom | Present | Identify topics<br>Product name | |
| 22 | 12/12/2021 | 8:00 AM | Zoom | Present | Forming topic<br>Submitting the topic | |

*Figure 14: Team meeting individual proof 4*

| | Date | Time | Platform | Mathanika | Discussions | Conclusions |
|---|---|---|---|---|---|---|
| 22 | 12/12/2021 | 8:00 AM | Zoom | Present | Forming topic<br>Submitting the topic | |
| 23 | 12/12/2021 | 8:00 PM | Zoom | Present | Literature review<br>Technical side | No meeting on Monday morning |
| 24 | 19/12/2021 | 8:00 PM | Zoom | Present | Task allocation<br>New idea finding | |
| 25 | 20/12/2021 | 8:00 PM | Zoom | Present | New ideas<br>TAF rewrite<br>Supervisor contact | Find a relavent component for Vithursan |
| 26 | 21/12/2021 | 8:00 PM | Zoom | Present | Present | |
| 27 | 22/12/2021 | 8:00 PM | Zoom | Present | Present | |
| 28 | 23/12/2021 | 8:00 PM | Zoom | Present | Present | |
| 29 | 24/12/2021 | 8:00 PM | Zoom | Present | Present | |
| 30 | 27/12/2021 | 8:00 PM | Zoom | Present | Present | |
| 31 | 10/03/2022 | 19:00 | MS Teams | Present | Progress status | |
| 32 | 12/03/2022 | 19:00 | MS Teams | Absent | Progress status | |
| 33 | 15/03/2022 | 19:00 | MS Teams | Present | Progress status | |
| 34 | 16/03/2022 | 19:00 | MS Teams | Present | Progress status | |
| 35 | 17/03/2022 | 19:00 | MS Teams | Present | Progress status | |
| 36 | 19/03/2022 | 19:00 | MS Teams | Present | Progress status | |
| 37 | 21/03/2022 | 19:00 | MS Teams | Present | Progress status | |
| 38 | 22/03/2022 | 19:00 | MS Teams | Present | Progress status | |
| 39 | 23/03/2022 | 19:00 | MS Teams | Absent | Progress status | |
| 40 | 24/03/2022 | 19:00 | MS Teams | Present | Progress status | |
| 41 | 26/03/2022 | 19:00 | MS Teams | Present | Progress status | |
| 42 | 29/03/2022 | 19:00 | MS Teams | Present | Progress status | |

*Figure 15: Team meeting individual proof 5*

| | Date | Time | Platform | Mathanika | Discussions | Conclusions |
|---|---|---|---|---|---|---|
| 41 | 26/03/2022 | 19:00 | MS Teams | Present | Progress status | |
| 42 | 29/03/2022 | 19:00 | MS Teams | Present | Progress status | |
| 43 | 30/03/2022 | 19:00 | MS Teams | Present | Progress status | |
| 44 | 31/03/2022 | 19:00 | MS Teams | Absent | Cancelled due to connection isssue | |
| 45 | 02/04/2022 | 19:00 | MS Teams | Absent | Cancelled due to connection isssue | |
| 46 | 05/04/2022 | 19:00 | MS Teams | Present | Progress status | |
| 47 | 06/04/2022 | 19:00 | MS Teams | Absent | Progress status | |
| 48 | 07/04/2022 | 19:00 | MS Teams | Present | Progress status | |
| 49 | 09/04/2022 | 19:00 | MS Teams | Present | Progress status | |
| 50 | 12/04/2022 | 19:00 | MS Teams | Present | Progress status | |
| 51 | 13/04/2022 | 19:00 | MS Teams | Present | Progress status | |
| 52 | 14/04/2022 | 19:00 | MS Teams | Absent | Cancelled due to New year | |
| 53 | 16/04/2022 | 19:00 | MS Teams | Present | Progress status | |
| 54 | 19/04/2022 | 19:00 | MS Teams | Present | Progress status | |
| 55 | 20/04/2022 | 19:00 | MS Teams | Present | Progress status | |
| 56 | 21/04/2022 | 19:00 | MS Teams | Present | Progress status | |
| 57 | 23/04/2022 | 19:00 | MS Teams | Present | Progress status | |
| 58 | 26/04/2022 | 19:00 | MS Teams | Present | Progress status | |
| 59 | 27/04/2022 | 7:00 PM | MS Teams | Present | Progress status, meeting journal | |
| 60 | 28/04/2022 | 7:00 PM | MS Teams | Present | Progress status | |
| 61 | 03/05/2022 | 7:00 PM | MS Teams | Present | Progress status,<br>PP1 Marking Rubric discussion | |
| 62 | 04/05/2022 | 7:00 PM | MS Teams | | | |
| 63 | 05/05/2022 | 7:00 PM | MS Teams | | | |
| 64 | 07/05/2022 | 7:00 PM | MS Teams | | | |
| 65 | 10/05/2022 | 7:00 PM | MS Teams | | | |
| 66 | 11/05/2022 | 7:00 PM | MS Teams | | | |

*Figure 16: Team meeting individual proof 6*

## 4. Task Allocation

### 1. Individual Tasks



*Figure 17: Remaining Tasks in planner 1*



*Figure 18: Remaining Tasks in planner 2*

2. Individual Completed Tasks
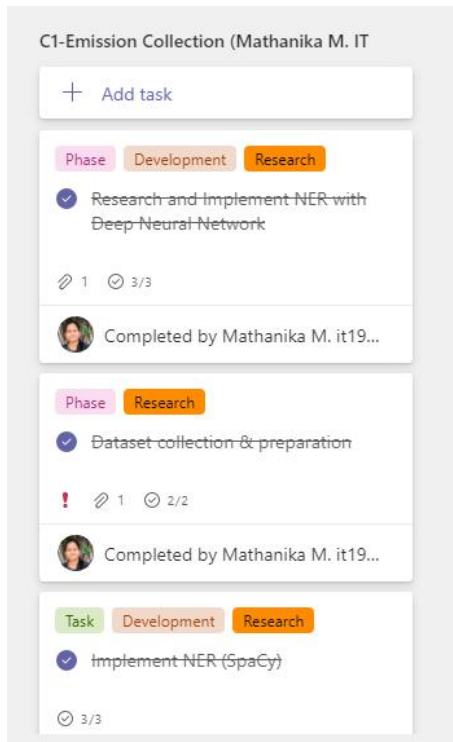


*Figure 19: Completed Tasks 1*
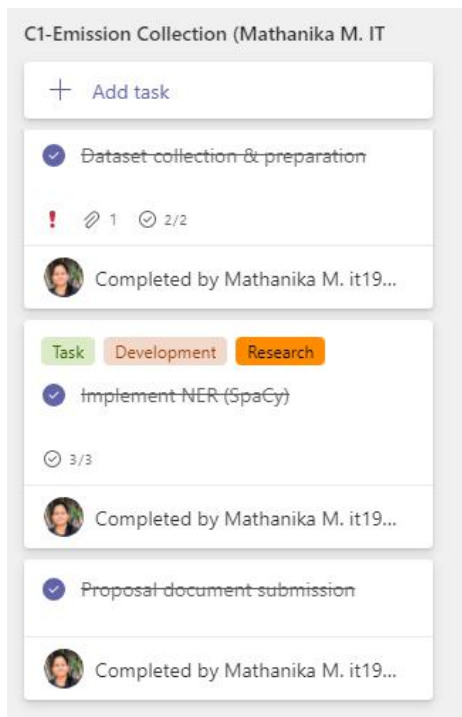


*Figure 20: Completed tasks 2*

## Bucket
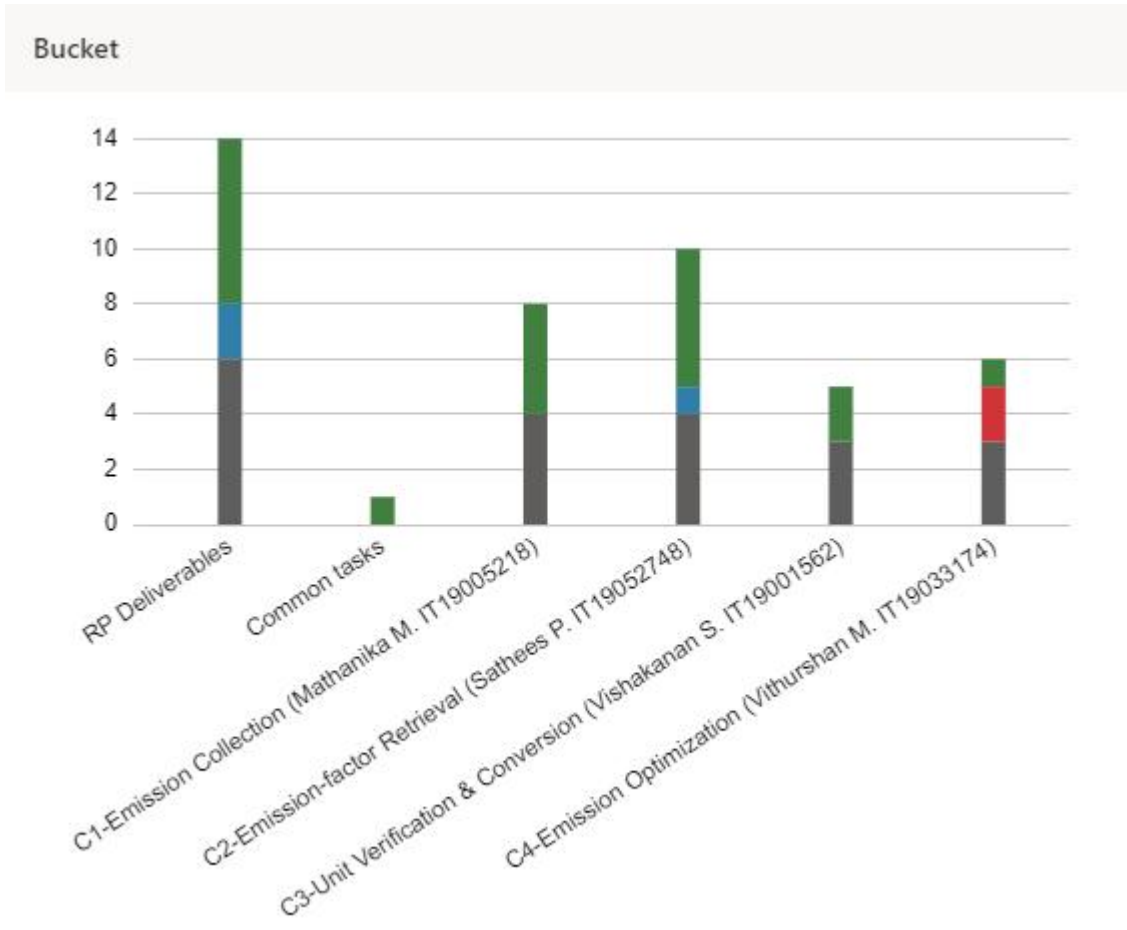


*Figure 21: Task report generated by planner*
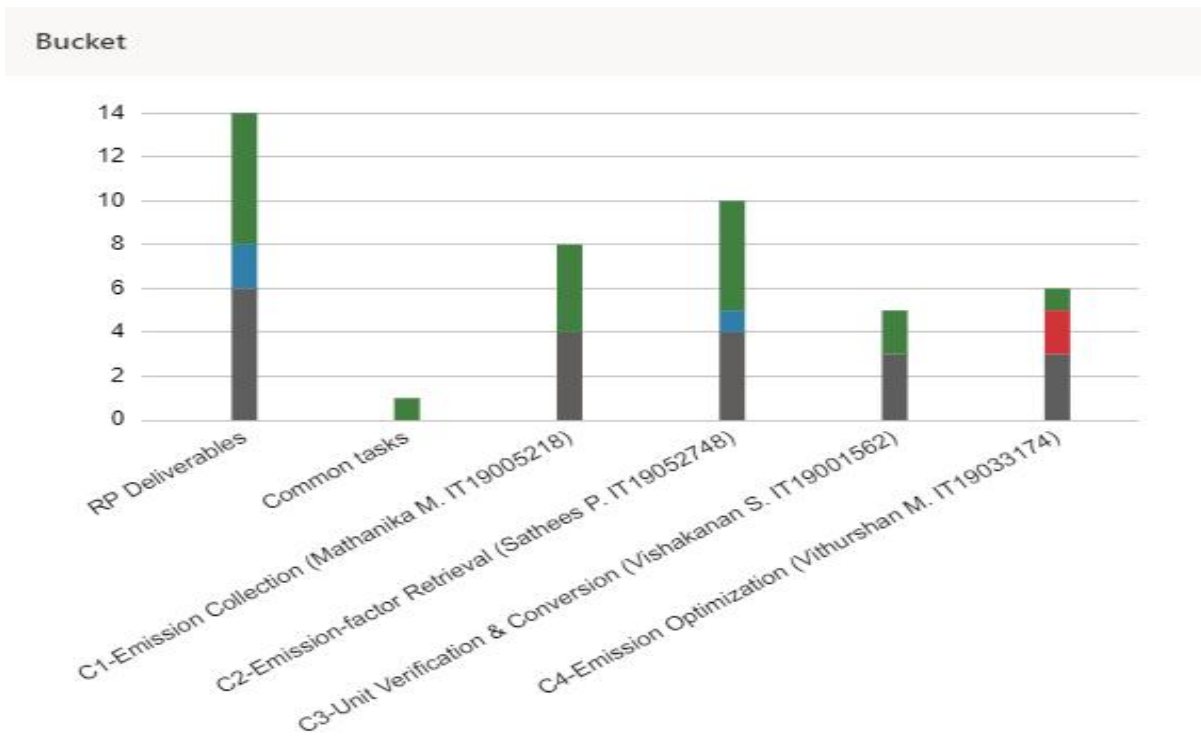
*Figure 22: Planner charts*
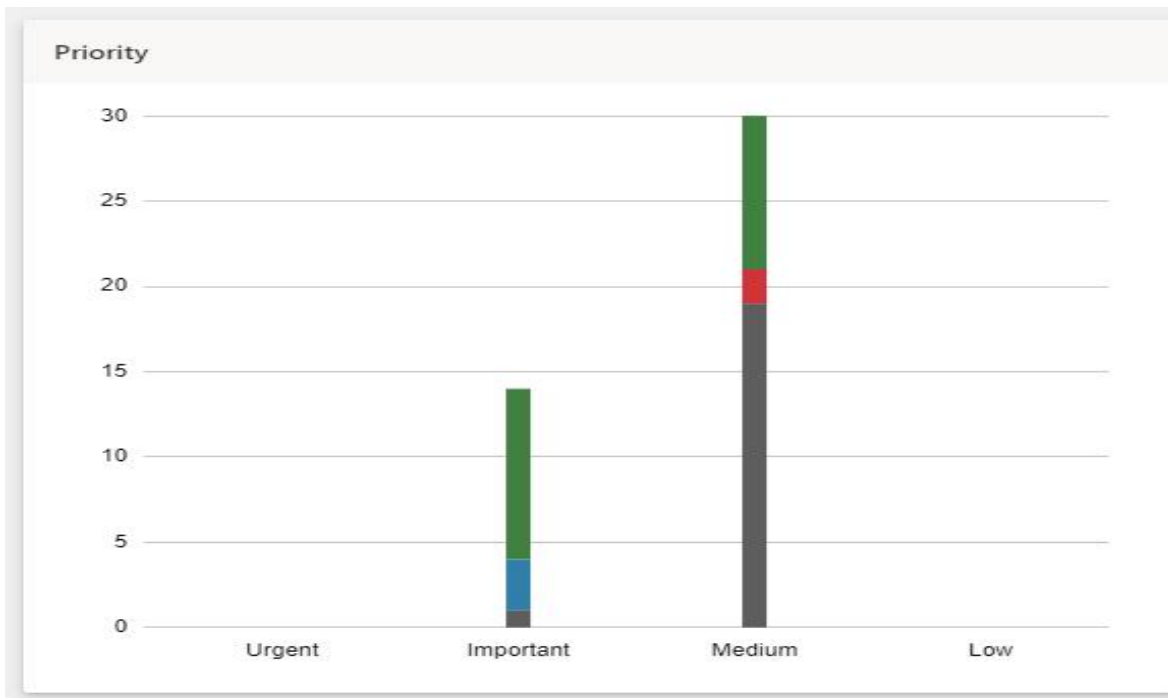


*Figure 23: Planner charts*

## 5. Project Demo (Spacy Model)

```
In [9]: nlp_ner = spacy.load("./model-best")

In [10]: doc = nlp_ner('''today we travelled 5 km using car''')

In [11]: spacy.displacy.render(doc, style="ent", jupyter=True) # display in Jupyter
```

today we travelled EMISSION ACTIVITY 5 VALUE km UNIT using car

*Figure 24: Individual Demo of custom named entity recognition*

# 6. Gant Chart Comparison

## 1. Old Gant Chart



*Figure 25: individual Gant chart submitted with the proposal document*

## 2. Updated Gant Chart

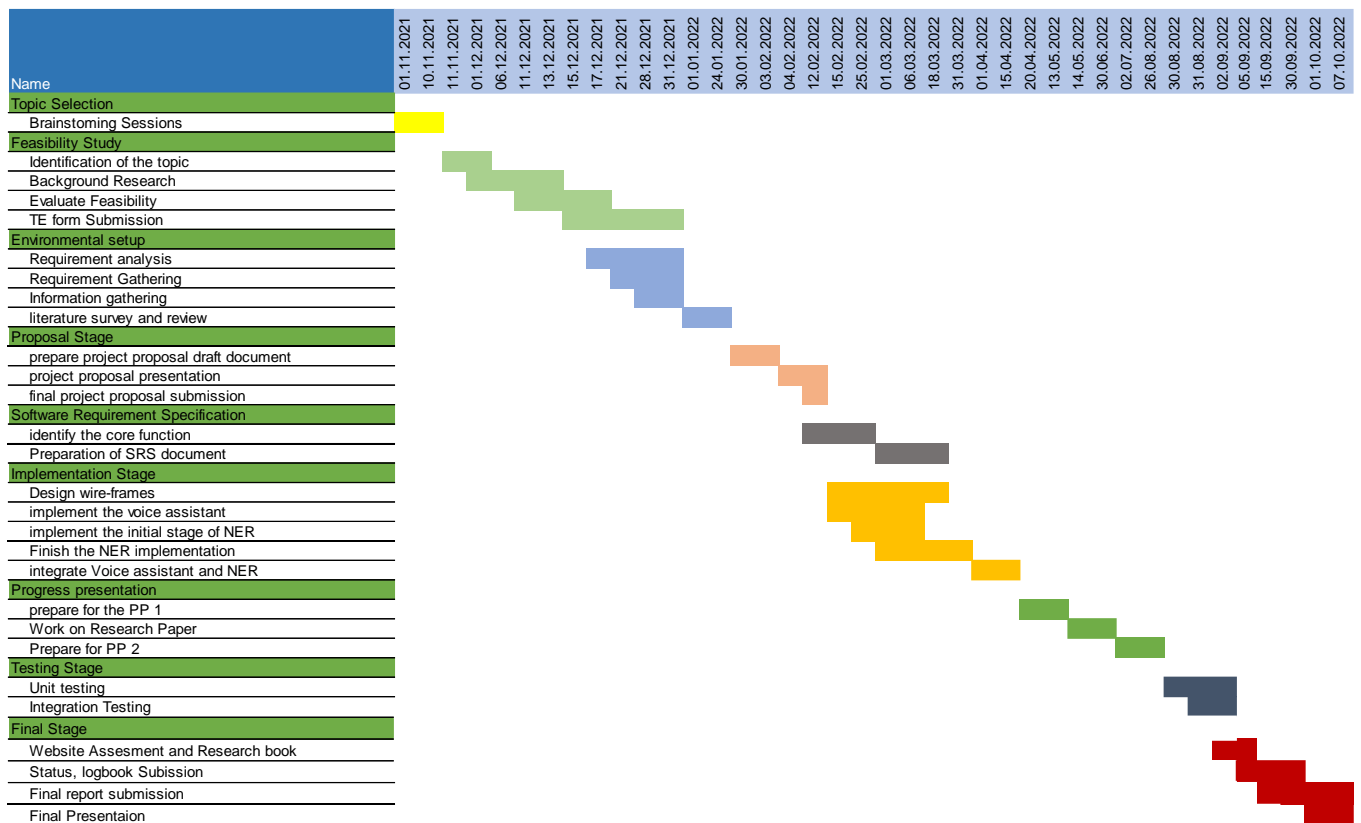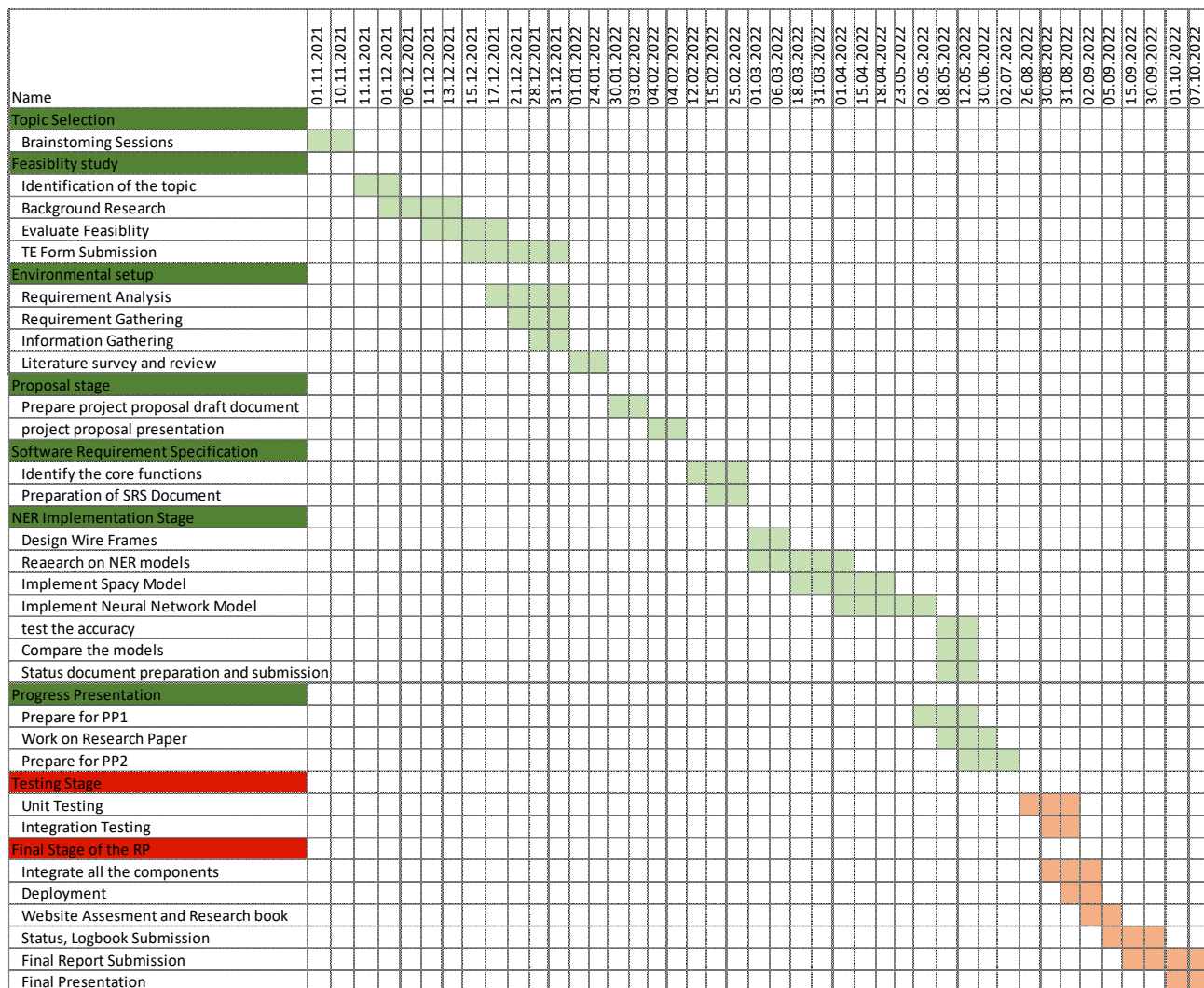| Name | Schedule (approx.) |
|---|---|
| **Topic Selection** | |
| Brainstoming Sessions | 01.11.2021 – 10.11.2021 |
| **Feasiblity study** | |
| Identification of the topic | 11.11.2021 – 01.12.2021 |
| Background Research | 01.12.2021 – 11.12.2021 |
| Evaluate Feasiblity | 06.12.2021 – 15.12.2021 |
| TE Form Submission | 15.12.2021 – 21.12.2021 |
| **Environmental setup** | |
| Requirement Analysis | 17.12.2021 – 28.12.2021 |
| Requirement Gathering | 21.12.2021 – 31.12.2021 |
| Information Gathering | 28.12.2021 – 31.12.2021 |
| Literature survey and review | 01.01.2022 – 24.01.2022 |
| **Proposal stage** | |
| Prepare project proposal draft document | 30.01.2022 – 03.02.2022 |
| project proposal presentation | 04.02.2022 |
| **Software Requirement Specification** | |
| Identify the core functions | 12.02.2022 – 15.02.2022 |
| Preparation of SRS Document | 15.02.2022 – 25.02.2022 |
| **NER Implementation Stage** | |
| Design Wire Frames | 18.03.2022 – 31.03.2022 |
| Reaearch on NER models | 31.03.2022 – 01.04.2022 |
| Implement Spacy Model | 01.04.2022 – 15.04.2022 |
| Implement Neural Network Model | 15.04.2022 – 18.04.2022 |
| test the accuracy | 08.05.2022 – 12.05.2022 |
| Compare the models | 08.05.2022 – 12.05.2022 |
| Status document preparation and submission | 08.05.2022 – 12.05.2022 |
| **Progress Presentation** | |
| Prepare for PP1 | 02.05.2022 – 08.05.2022 |
| Work on Research Paper | 08.05.2022 – 12.05.2022 |
| Prepare for PP2 | 30.06.2022 – 02.07.2022 |
| **Testing Stage** | |
| Unit Testing | 26.08.2022 – 31.08.2022 |
| Integration Testing | 26.08.2022 – 31.08.2022 |
| **Final Stage of the RP** | |
| Integrate all the components | 26.08.2022 – 31.08.2022 |
| Deployment | 31.08.2022 – 02.09.2022 |
| Website Assesment and Research book | 02.09.2022 – 05.09.2022 |
| Status, Logbook Submission | 05.09.2022 – 30.09.2022 |
| Final Report Submission | 01.10.2022 – 07.10.2022 |
| Final Presentation | 01.10.2022 – 07.10.2022 |

*Figure 26: Updated Gant chart after some tasks complete*