Retrospective Sprint 1
of
Group BLOCKS7PG

Block Model Compression Algorithm

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Snapshot Week 3 of Group BLOCKS7PG

Product Backlog and Task Board:

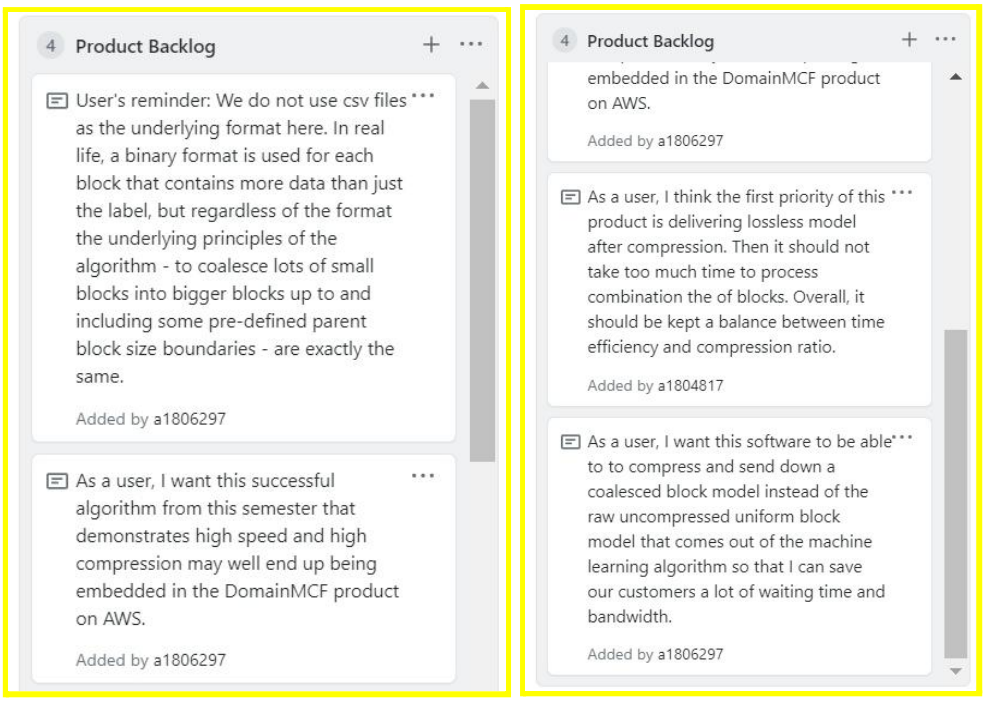


Figure1: Product Backlog1.1

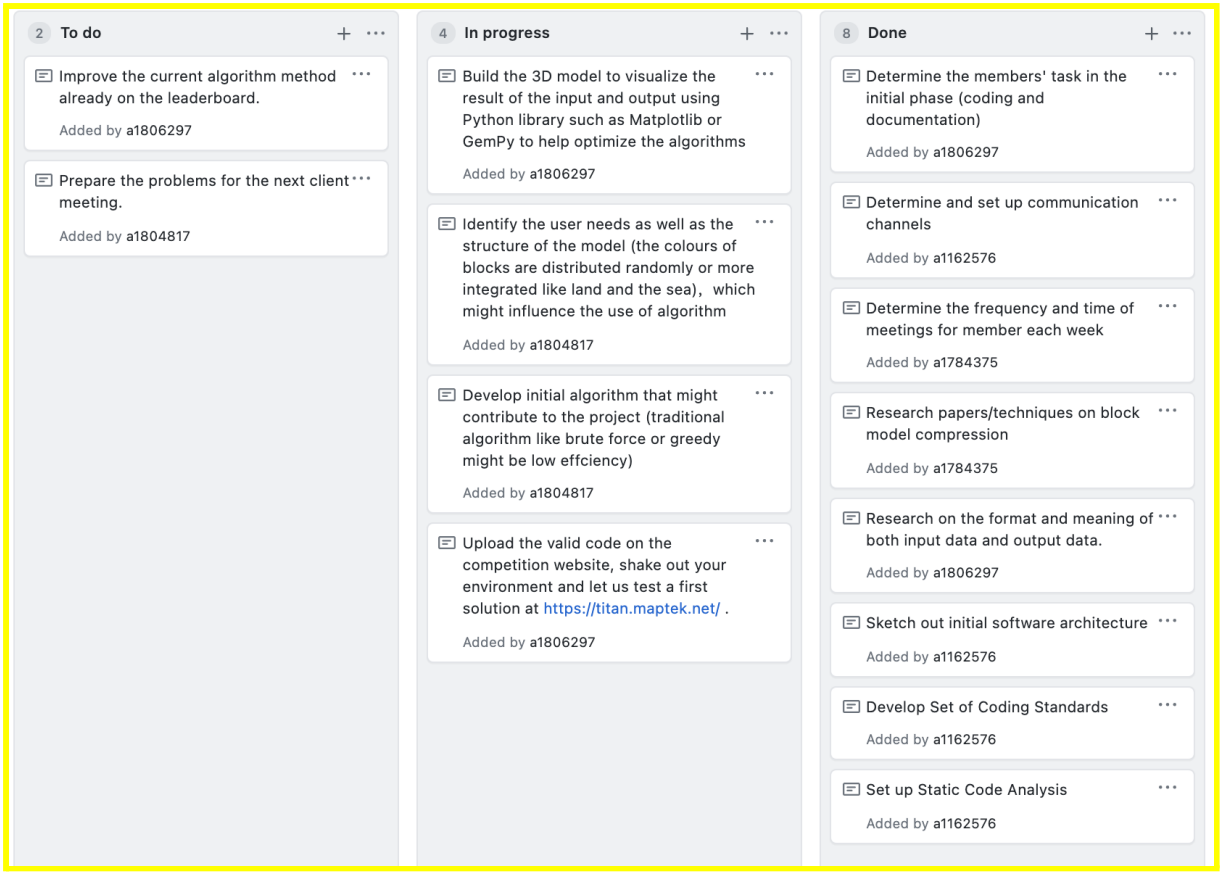


Figure2: Task Board1.1

Sprint Backlog and User Stories

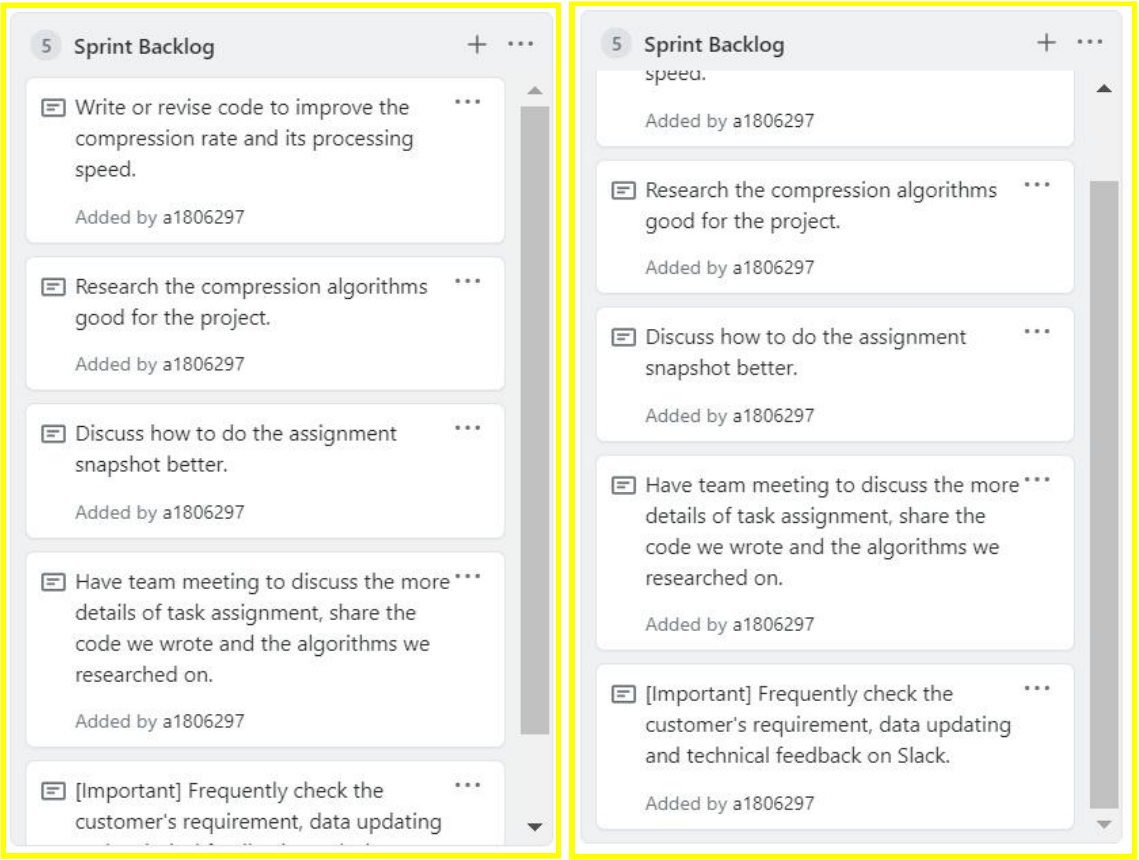


Figure3: Sprint Backlog and User Stories 1.1

In the middle of the week, Yuanpeng has written and submitted the first version of code to the competition system and have a compression rate of 89.23% and processing speed of 37.32% for the input data "the_intro_one_32768_4x4x4" and compression rate 74.59 % and processing speed 36.18% for the input data "the_fast_one_376000_2x2x2 ". In the sprint, we would revise the current code to **improve its compression rate and processing speed**. In addition to the code written from scratch, we also **research the algorithm methods** such as Run Length Encoding (RLE) to achieve better compression and speed.

In the team meeting, we **discuss how to assign tasks and assignments better** to implement the project more efficiently. The Scrum Master asks the team to frequently check the updated information on Slack, where the customer will update the user stories and any technical feedback. It can assist the team in designing and implementing the programs.

Definition of Done

In the current phase:

- The code we develop is required to take standard input (strings of the form "x, y, z, x_size, y_size, z_size, 'domain'") and produce the result on standard output described in the project documentation.
- Either a .exe file or a Python script must be submitted to a verification service: MAPTEK TITAN.
- According to the user stories, we can submit our code once it improves the compression rate and processing speed, no matter how good they are.
- The datasets of input block models we implement must be comma-separated values (CSV) where each line encodes a block as a string of the form "x, y, z, x_size, y_size, z_size, 'domain'" and the code we develop is required to output a stream of the same format.
- The algorithm we develop must process a block model in slices of no more than parent block thickness at a time, rather than loading the entire input stream into memory first.
- All pull requests of code must be submitted on our Github repository, tested, and reviewed by two other team members (or one in the case of documentation/admin).
- The branches must pass the static code analysis before being merged. The Static Analysis ensures that the codes meet the PEP8 style standards (what all python code should aim for) and other issues such as unused variables and cyclomatic complexity. PEP8 is especially important for the developers because it mandates a set of conventions for things such as class/function names, spacing, and comment style. It allows all the developers to be able to read every developer's code in the same way.

Summary of Changes:

In the first week of the first sprint, we set up the communication tools, scheduled regular weekly meetings, collected the team member's ideas, assigned the tasks, etc. We also added user stories in the Product Backlog on our Github Projects and revised the Definition of Done (DOD).

The sprint goals have been set in the Sprint Backlog, including figuring out the project and user stories. We executed the tasks such as designing the algorithms and figuring out how to use the competition system and successfully wrote the first version of the code. We managed to revise and develop better algorithms.

Snapshot Week 4 of Group BLOCKS7PG

Product Backlog and Task Board:

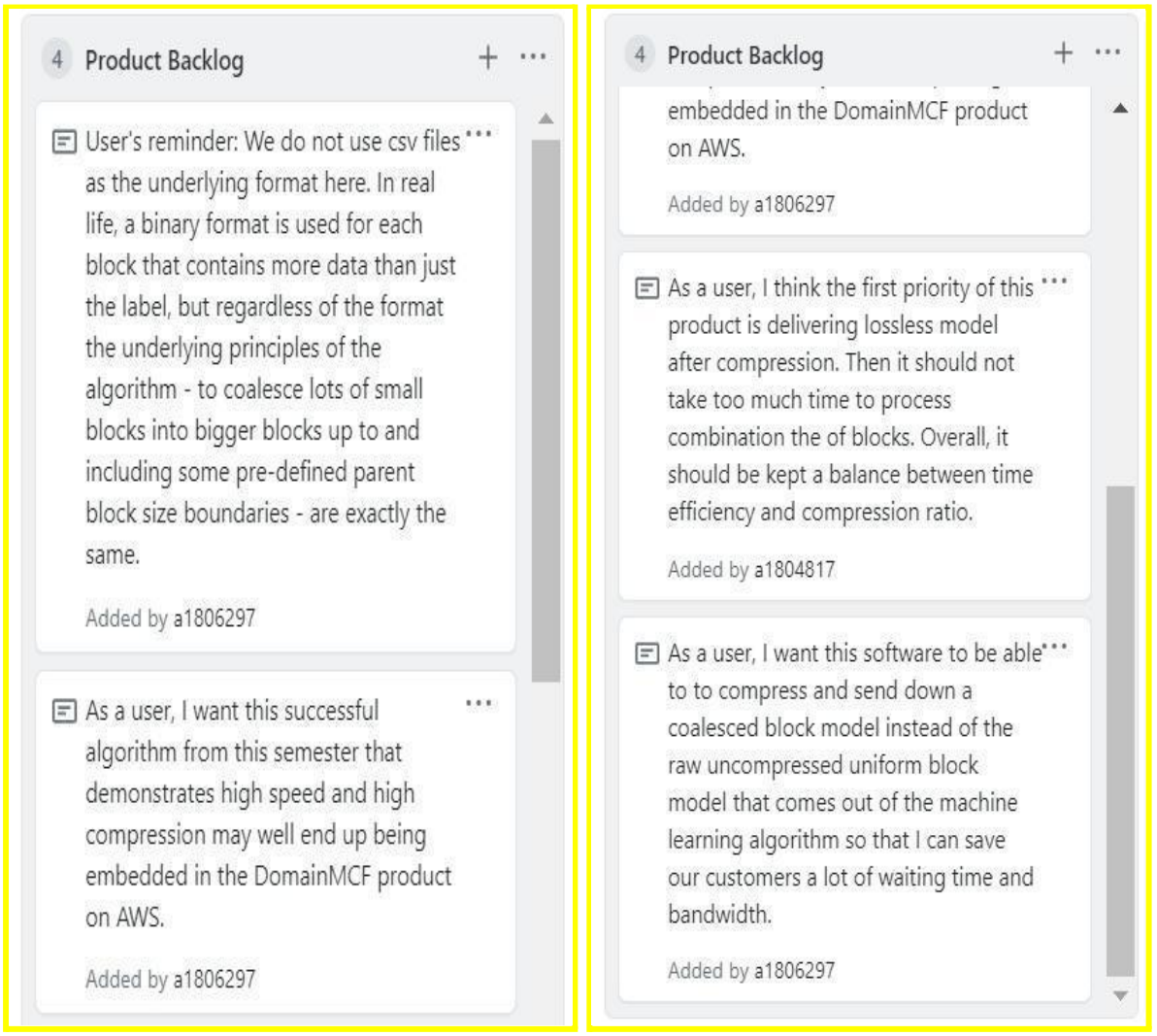
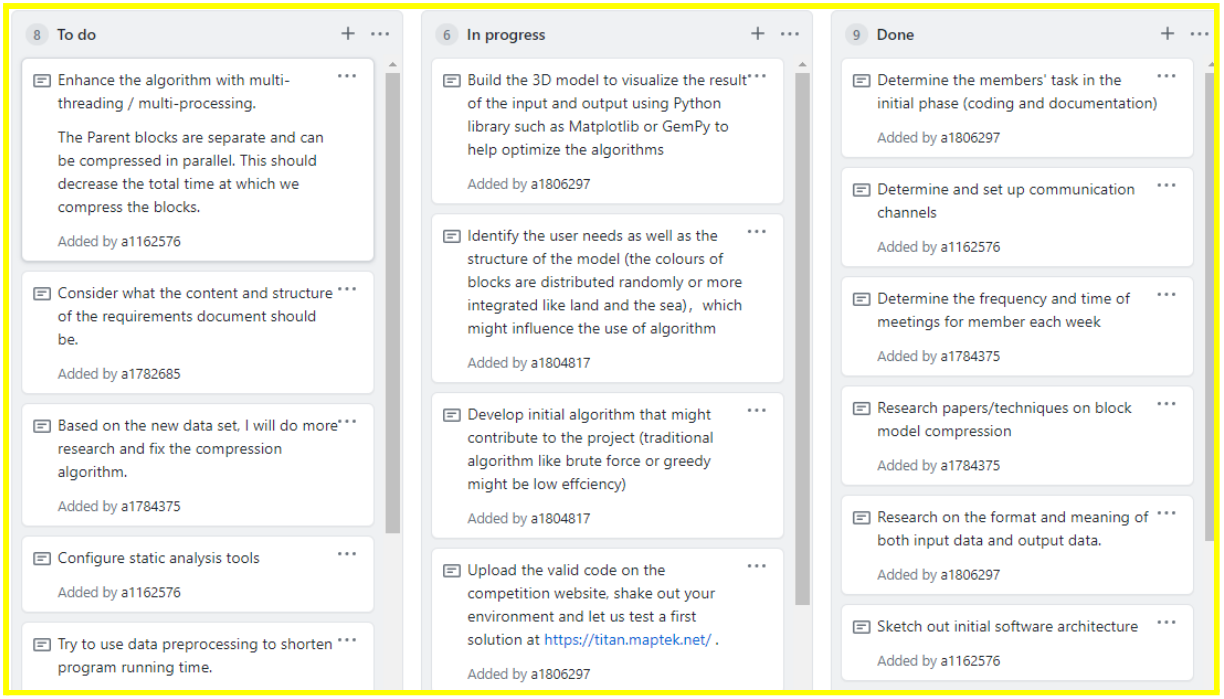


Figure 4: Product Backlog 1.2



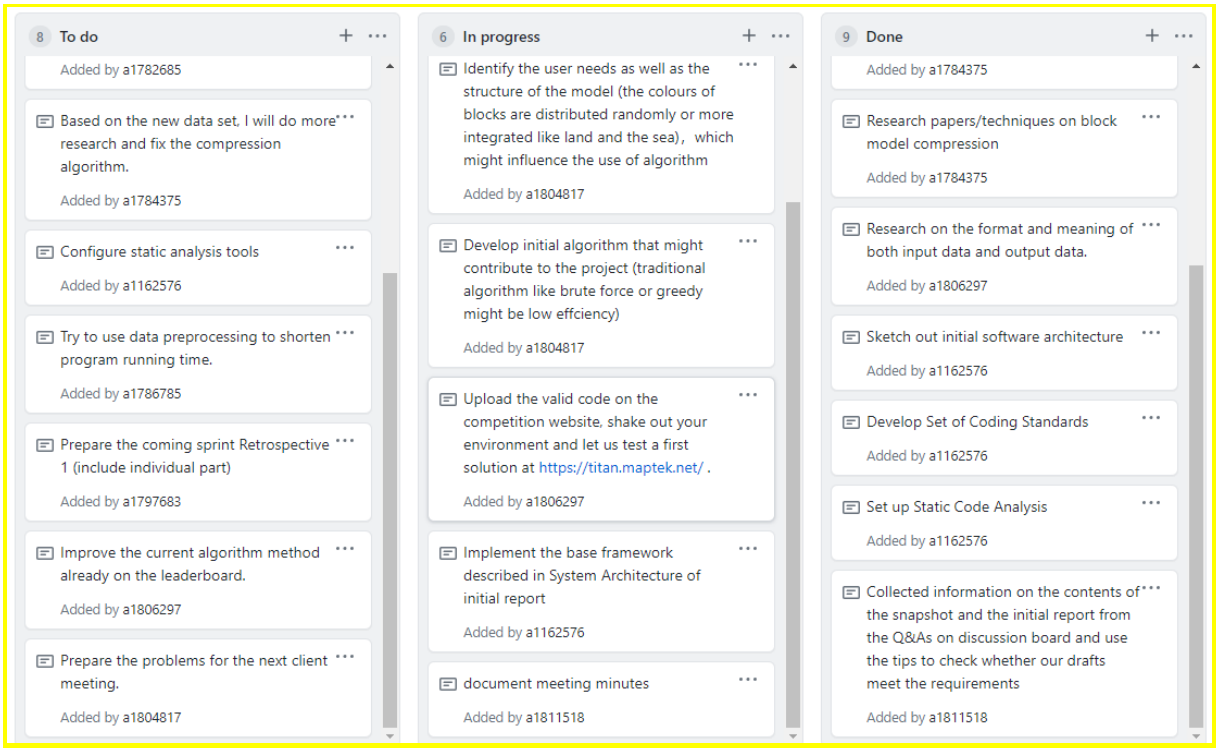


Figure 5: Task Board 1.2

Sprint Backlog and User Stories

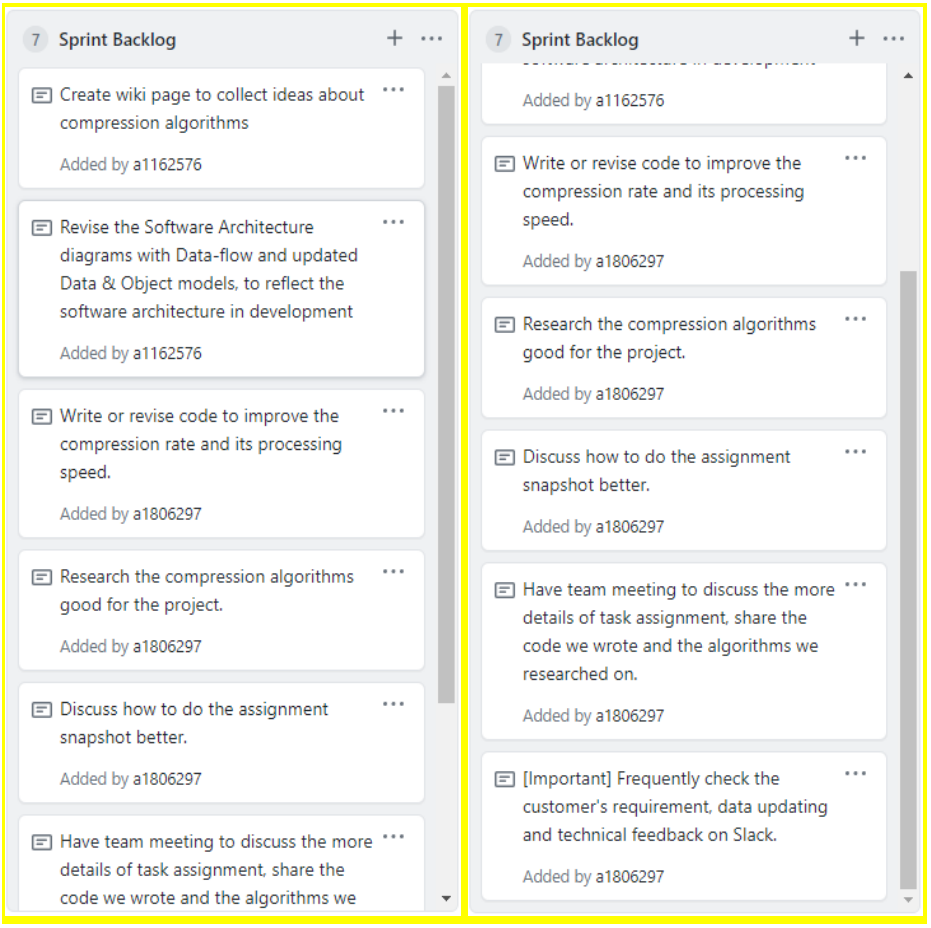


Figure 6: Sprint Backlog and User Stories 1.2

Since we have completed the first stage of the client's requirements ahead of schedule, and the new test file has not been uploaded by the client, the main work this week is to **optimize the coding algorithm and data structure.** We try to **create a wiki page to collect ideas** about compression algorithms so that we have more options to try to compress images. In addition, we **revised our software architecture** and tried to **use Object models to reflect the software architecture** in development.

Definition of Done

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Summary of Changes:

The main work of this week is improving the existing code. After the sprint review, we focused on the following three areas: algorithm improvement, data structure improvement, and multithreading/multiprocessing in Python. In addition, our software architecture has also been further improved, and we have tried to use 3D object models to facilitate our model analysis.

In terms of client communication and project progress, we plan to use the wiki page to collect ideas about the compression algorithm, summarize and analyze problems in the current project, and prepare questions for the client meeting next week. In addition, we selected suitable candidates to be Scrum masters according to the current situation of team members, so as to ensure that these scrum masters can effectively organize all team members, assign tasks, and complete the goals of each sprint.

Declaration:

I attended:

- the kickoff and sprint 1 planning meeting on 5th August, 2021 with the tutors, Aryaman Dhawan and Will Reid.
- the sprint 1 retrospective meeting on 25th August, 2021 with the other team members.
- the sprint 1 review and sprint 2 planning meeting on 26th August, 2021 with the tutors, Aryaman Dhawan and Will Reid.

What went well in the sprint:

In the first sprint, our team identified the project vision, user stories, software architecture, tech stack and standards after writing the initial report according to the customer's needs.. We had a better understanding of the project by asking the customer some of the related questions via our communication platform Slack. In addition, we created Github Projects and Github Wiki to complete the sub-task assigned to each team member. Our small achievement was to be ranked on the leaderboard by implementing the code using the given two datasets(the_intro_one_32768_4x4x4 and the_fast_376000_2x2x2). This effort enabled our team to get more familiar with the customer’s requirements in the future.

What could be improved:

In the sprint 1 retrospective meeting, I found out that we could have analysed the project more carefully during the first sprint. Our task assignment was too simple. We only divided the task into “documentation” and “coding” in the beginning of the sprint since we thought that the customers' requirement in this sprint was only to figure out the algorithm solutions to the block compression. In spite of the achievement on the leaderboard, we still had the same

pattern of task assginment. This made our code too simple to improve the compression rate and its speed without better algorithm research and result visualization. In addition, since the compression algorithms research was not as efficient as we expected, the methods and task assignment for the algorithms part could be changed.

What will the group commit to improve in the next sprint:

After the discussion in the sprint 1 review meeting, our task delegation should be described in a more clear way. I proposed that we could create the position responsible for the model block visualization in order to improve our compression performance more efficiently with not only the text lines of the compressed blocks but also 3D block animation. Apart from the way of presenting output, finding useful compression methods is an urgent task in the next sprint. We will request the members to research the methods and share them on Github Wiki with the other members. The deadline of sub-task for every team member will be set up so that they could be focusing on their sub-task more than the last sprint and the team can discuss these methods to improve the performance of our compression algorithm.

Comment on your progress this sprint:

My progress completed:

- Researched on the format and meaning of both input data and output data.
- Completing a portion of the initial report and user stories by collecting the customer's needs and reading the project documentations.

My in-progress tasks:

- Build the 3D model to visualize the result of the input and output using Matplotlib or Unity to help optimize the algorithms
- Manage to Improve the current algorithm method already on the leaderboard.

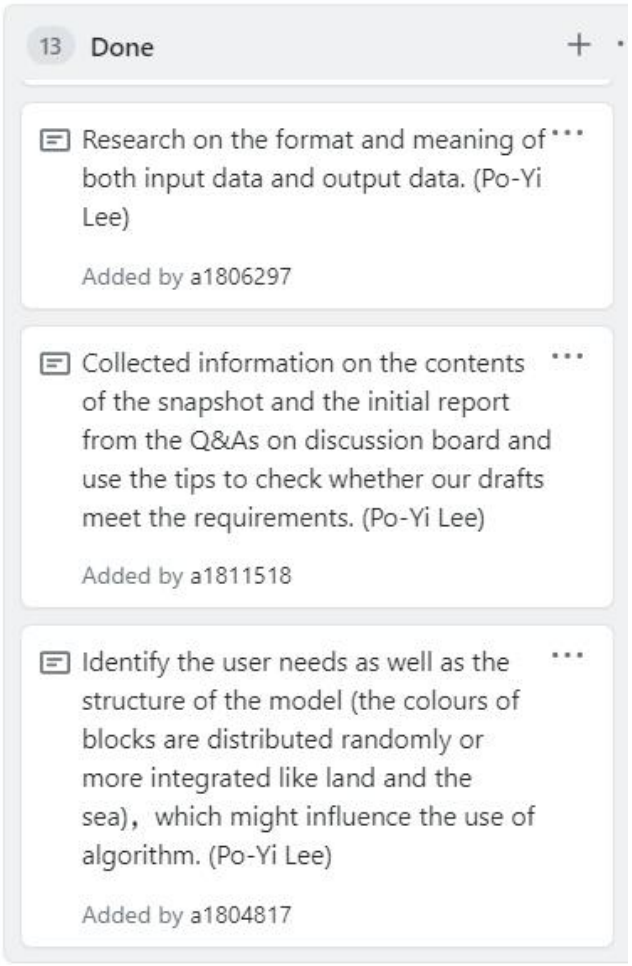

Figure 7: My progress completed

Figure 8: My in-progress tasks

As the scrum master for the first sprint, I spent a lot of time communicating with the other members about task delegation and daily scrum context. Considering the project vision and customer's requirements, I figured out how the result of the block model should be presented and also drafted the user stories, posting all the project details on the Read.me file of our Github repository to ensure all the members were on the track of the project. In order to speed up the revision of algorithms, I am working on how 3D block models can be visualized and better algorithm methods.

Requirements Changes:

Compared to the first sprint, the second sprint will be more challenging due to the complexity of the block compression. The customer mentioned that in the following sprint, they would provide the compression request with different datasets such as compressing the block model using non-cube parent blocks (not released yet). Our team should extend our methods from the sprint 1 and implement the block model visualization to tackle these more complex compression questions. In addition, our team should think of more methods and do more research on these questions since there will be more variety of compression requirements for the future tasks.