1.I choose to do **Drawing App** as my template because this application is very useful in our daily life. It is a basic application for almost every single computer, and also needs a lot of extensions to enhance its power.

Until now, I have chosen **Stamp Tool** and **Scissors Tool** as my extensions. For construct them, I used some coding techniques such as,

* nested looping,
* constructor functions,
* arrays of objects,
* use asynchronous call,
* group related functions in one file ,etc.

For example, I made a plan before I started to code and drew a nested diagram first. To keep the code clean and easy to edit. I choose to put the same kind of code into one file such that I can make sure they are all related to the same duty. This helps me easier to make a correction and find where the problem is. And I named variables by using names that are easy to understand and have similar shapes, which makes them easy to remember and easy to modify.

For the complexity, These two extensions are quite complicated. Although we have clear expectations about the functionality of these extensions, planning a production route is a complicated work. For example, I want to make this application a project which can be easily to add more extensions later. This means that whenever I need to add a further extension, I just need to create more files contain their own function code, then link these JavaScript files to the main sketch file and call them to keep the functionality up and running later. But it also presents challenges because it requires that sub-files should not conflict logically with each other to ensure proper operation, while ensuring that the extensions on the user interface are in line with the intent of the application design. These files are like a vast, interwoven network, which makes programming more difficult because there are always two or more files that are logically linked to each other, and an extension problem often means that there are many places where code modifications are required. This is a challenge for my code familiarity and proficiency in programming languages.

Beyond that, there are many technical problems that I need to solve. For example, I encountered a problem where a image could not be displayed properly because it was cross-origin, and at first I didn't know what the problem was, after through a large number of research over the network that I finally learned that I had to convert it to BASE 64 format that I was able to solve the problem.

2.About the progress, I want to talk from two dimensions. One is the current design work and another is my current code progress.

For design work , I have done the brainstorming of ideas first, then I draw a code diagram and made notes on the diagram about the code I am going to use and functions I need to create. In details, I go through the course videos on Coursera first, then I draw a mind map like a nest on the draft paper. The mind map contains what files I may need to create for the application and its expired functionality with their links between each other. By follow the map, I created an index file for linking functions, a CSS file for adjusting the style of objects so that it can meet my requirement of the interface design. By the way, I follow the course video to design my Drawing app’s interface, which is very traditional but useful.

After the two basic files, I continue to create other extension JavaScript files, which contain their functions.

‘colourPalette.js’ contains the function of controlling the color change;

‘linetoTool.js’ is for containing the function of LinetoTool;

‘freeHandTool.js’ is for containing the function of‘FreehandTool’;

‘mirrorDrawTool.js’ is for containing the function of ‘MirrordrawTool’;

‘star.js’ is for containing the function of StampTool;

‘scissorsTool.js’ is for containing the function of ScissorsTool;

‘helperFunction.js’ contains the function of controlling buttons;

‘sprayCanTool.js’ is for containing the function of SpraycanTool;

‘sketch.js’ is the main JS file which contains call the variable for other functions, set up their job and preload any big files.

So in total, for this mid-term, my project contains 10 JavaScript file and 1 HTML file and 1 CSS file.

Then I use the index with <script> tag to link all those JS files. And <link> tag to link it with the CSS file so that this application can work and show properly.

In the future, I will add more JavaScript files, which contains functions of my original extensions. Besides the JS file, the variable calls in the main sketch file is also essential and also need to link it with the index file so that it can run properly. For the extension, I may get some inspirations from a third-party platform such as YouTube.

I created a Gantt Chart to describe my time arrangement of those activities related to my work.

The reason why I allocate my activity in this way is followed by the course calendar of Coursera. For the works before mid-term, I can simply follow the guide course video and hand in the project in time. So the time spend on each part is about 2-3 weeks. After mid-term, I need to create my own original extension without guide videos. Besides, I still need to do other coursework. Therefore, before the final exam, I decide to spend about 6 weeks on this part, in the mean time, I may need to write the final report within 2 weeks as well. So there is going to be a little overlap in the time of the work. And the rest part of work like debugging and testing and so on, I may still arrange 1-3 weeks for them.

All in all, my plan is to finish the project, including all extensions creating and testing, report writing and debugging, before 1ST September 2021.