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CMPT 481
Milestone 1 Report

Video link: www.youtube.com/shorts/6jH3oO2CJW0

Milestone activities and progress

1. *Research*: Further research is required to ensure appropriate technologies, libraries, etc. are used
   - Progress: Partially complete
   - While there is little research left to do, I have encountered issues interpreting some handwritten characters using Google's ML Kit. Because of this, I may need to explore alternative OCR solutions. It is also possible that these issues are related to how I am processing the character bitmaps, which I would also need to further research and experiment with.

2. *Minimal presentation laye*r: Develop the UI to the point of enabling writing on-screen and recording of written input
   - Progress: Complete
   - In its current state, the project application contains a canvas that enables users to write characters on-screen. It also contains a surface to interpret touch gestures. There are no known issues with these components. From a user-input perspective, the applications contains everything necessary to enable the interaction technique.

3. *Minimal input processing layer*: Implement the functionality to process touch inputs. Recordings of written characters should be processed correctly by the OCR, and touch gestures should be correctly interpreted.
   - Progress: Partially complete
   - As mentioned previously, there are issues interpreting certain characters. Specifically, I've noticed that some characters are interpreted correctly nearly all the time, some roughly half the time, and others are almost never interpreted correctly. I believe this issue lies with Google ML Kit. From what I understand, this OCR is is primarily used to recognize text in images with other non-text elements, which presents a few issues when interpreting single characters. For example, suppose I were to draw a single 'O', the OCR may not be able to distinguish this as a letter when it could just as likely be interpreted as a circular object in the image.
   - The application is nearly complete in terms of gesture recognition. Only three types of gestures are supported in the interaction technique; double tapping, one-finger horizontal swipes, and two-finger horizontal swipes. The first two are complete and functional, while the third has yet to be implemented.

Next steps

- Fix character recognition so that all characters can be interpreted consistently (high priority)
- Implement two-finger horizontal swipe gesture recognition
- Create command state system and map interpreted characters and gestures to their proper commands.