In conclusion of the project, we built a OCR software that recognizes a word from the image containing the handwritten word. The most important part was building our own model- we could have used an OCR model from internet, but we decided to apply our knowledge from class about machine learning models and many other class materials to make our own model. We divided our group into two and each developed their own model to compare two different models and “compete” their performance to use better model. As a result, the second model using CNN and RNN with LSTM was determined to be better overall, considering performance, speed, and easiness of using the model on application software. The trained model was applied on dash webapp, which was built for easy user interaction. Users can input a png image of handwritten word and the webapp will use model to print out the predicted word.

The ethical ramification of this project is mostly harmless- in fact, it has much more ethical benefit to humanity than harms. The OCR software and model can be used to assist people with bad vision, such as elders and blind people; for example, the OCR software can read the text of a news article and read it out loud for those who cannot see the text. Also, it can be applied to various fields, such as autonomous robots and vehicles. They can read the road signages using the OCR models, and determine what they have to do to follow the signs. However, there are some harms that can be caused by this project; first, the application to autonomous

robots aren’t always ethical. The autonomous robots can be used for military purpose or many other criminal/unmoral activities. Also, there is a concern about copyright issue- the OCR models can read or scrap texts out of copyrighted materials such as books, and use it digitally without the author’s consent. Actually, this is a very widespread concern in modern days since several AI models are webscraping copyrighted arts/texts to train themselves, which should not happen without the creators’ consents. When using our project in the future, these possibilities of ethical problem should be concerned before using the model.