
EE/CprE/SE 491 WEEKLY REPORT 1

1/30/24 - 2/11/24

Group number: 13

Project title: Allergy Prediction AI

Client &/Advisor: Ashraf Gaffar

Team Members/Role:

Eric Christensen: Initial Component Design

Zoe Davis: Team Organizer

Josh Dutchik: Documentation and Frontend Support

Blake Friemel: Frontend Development and Testing

Jack Gray: Front and Backend Testing

Michael Koopmann: Client Interaction

Jihun Yoon: New Member

○ **Weekly Summary**

The overall objective for this week is to pick 1 or 2 keras.io models that are relevant to our project and go through the example guides. The guide gives us example data and shows how to run and train the models with their data. Our goal is to complete these guides with their data and get a better understanding of what adjustments we will need to make with our project and data. Other goals of ours are to begin working on the framework for our entire project to get a working AI model/frontend/backend for our group to begin building upon, improving upon, and test so that we can continue to constantly improve our total project over the entire week.

This week our group focused on understanding various machine learning models, began setting up and training a Keras model, delved into our given data (this included cleaning and formatting the data), and overall expanded our knowledge of the aspects needed to complete this project.

○ **Past week accomplishments**

- Eric Christensen: Studied different types of machine learning models and what types of different models work best with particular types of data and requirements. Worked on setting up a demo Keras model with sample data that was familiar with the data we received. Began writing and configuring next steps and main objectives for the near distant future.
- Zoe Davis: Self studied the given data. Looking over and learning the data helps with finding what AI model is needed to be used for this project. After going over the data, I started researching models and learning how they work to figure out which would be best. I experimented in Keras to better my knowledge. I now have a greater understanding of what we need to with the AI model to move forward in this project
- Josh Dutchik: I worked on getting the GitHub functional and ready for the group to be able to use and continue pushing to. There was a previous GitHub that we worked on last semester that was stored locally on my computer, so I worked on getting those files and programs up to the public GitHub repository for everyone else to look at and use. I began working on the connections between the frontend, backend, and AI model. The goal is in the next couple of weeks to get a full working project and then focus on the results, specifically the AI model, to be correct and to be able to start testing. The final thing I worked on throughout the week was looking over the data we were given last semester and took notes and wrote down some ideas on the inputs we are given and the impact they have over the AI Model.
- Blake Friemel: Developed association rule mining rules for the AI model that we will use and researched how our team should obtain access to the Amazon and Google cloud computing platforms.
- Jack Gray: I explored all possible AI models on Keras.io. I found two AI models that are very similar to our project. I read the descriptions of the two models and distinguished between the two of them. After reading through the details, I noticed one is a more up to date version than the other, but they deal with the same data and solve the same problem, so we can try using both. I then downloaded the correct environments and tools and started to follow the example guide on keras.io using their data.
- Michael Koopmann:
 - Cleaned and formatted the given data. This required determining the distinct/unique variables used in the notes section of patient data and the individual ingredients/allergens. In total, there were about 13 different medical note categories and 730 different ingredients. Then merged the two data sets together and set these categories to be binary columns to allow easier data analysis with heatmaps and correlation mapping between allergens/ingredients and notes.
 - Then trained a simple base neural network model to ensure that data was formatted and ready to use. The model was 256 layers dense and used the patient data for the 12 input nodes, and for the activation function, it used the relu function, which is a native linear function for Keras.
- (New) Jihun Yoon: I caught up with the project and group members. Familiarized myself with some of the code and diagrams. Currently determining which role I will fulfill with the group.

○ **Pending issues**

- Eric Christensen: A few issues with compilation of the Keras software and compatibilities but otherwise no other issues.
- Zoe Davis: My computer stopped working last week so that inhibited my ability to work on this project for a few days. I now have a computer so this shouldn't be a problem again.
- Josh Dutchik: Make sure Jihun can access GitHub and has privileges to push and make changes in the future. This is simply because it is a new group member, very easy to fix
- Blake Friemel: AWS and GCP require a license to use.
- Jack Gray: No issues.
- Michael Koopmann: No issues.
- (New) Jihun Yoon: I joined the group halfway through this week, so I still need some time to fully catch up with all the work done so far. I also haven't had much experience in JavaScript and CSS, so I need to review the languages.

○ **Individual contributions**

<u>NAME</u>	<u>Individual Contributions</u> <i>(Quick list of contributions. This should be short.)</i>	<u>Hours this week</u>	<u>HOURS cumulative</u>
Eric Christensen	Made experimental keras models with sample data	7	15
Zoe Davis	Researched/experimented with given data and Keras models	6	13
Josh Dutchik	GitHub, Frontend/Model/Backend Connection, Creation of the frameworks of the project	6	14
Blake Friemel	Frontend design and getting access to AWS and GCP resources	6	14
Jack Gray	Tested different Keras AI models with test data and narrowed down which few models would work best	7	15
Michael Koopmann	Reformatted the excel files and made a simple neural network model in jupyter notebook	11	17
(New) Jihun Yoon	Reviewed the design document for the project and the source code via github	3	3

○ **Plans for the upcoming week** *(Please describe duties for the upcoming week for each member. What is(are) the task(s)?, Who will contribute to it? Be as concise as possible.)*

- Eric Christensen: Finish setting up Keras model and begin evaluating data accuracy among other models.
- Zoe Davis: Work as a group with Eric Michael, and Jack on the Keras model
- Josh Dutchik: Focus on the connections between the backend, frontend, and ai model and get a stable framework of the entire project that we can begin building from and testing
- Blake Friemel: Help with frontend development and get access to cloud computing platforms.
- Jack Gray: Continue to go through the example keras.io models that were picked. Hopefully, we can get both examples running and explore training them by the next meeting. We will start off by using their data.
- Michael Koopmann: Train a better/more sophisticated model and further refine the jupyter notebook
- (New) Jihun Yoon: Further review documentation and JavaScript/CSS languages. Meet with team to obtain a permanent role and section of the project to work on.

Grading criteria

Each weekly report is worth 10 points. Scores will be awarded as follows:

- **8 – 10:** Progress for your project seems to be suitable. Documentation and hours reported by team members are adequate.
- **6 – 8:** There is scope of improvement both in your report and your project progress. Can consult with instructor/TA after class for further inputs.
- **< 6:** Please talk to instructors/TA after class hours about any difficulties that you/your team is facing.

Each weekly report should be unique in that they have a unique set of supporting details for your contributions. So please do not just copy your reports from the previous week. In addition, please avoid any personal pronouns (he, she, I, you). Try to keep your reports as neat as possible.