EE/CprE/SE 491 WEEKLY REPORT 4

2/25/24 – 3/30/23   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: Backend Support

- **Weekly Summary**

    Eric focused on improving the accuracy/efficiency of the AI model with refactoring/experimenting. He also used the recent collaboration with Team 45 to help with his work with the AI model. Zoe learned how to use the current AI model with the help of Michael, and is working on creating tests for the model that will help with accuracy. Josh ensured that the AI model runs smoothly on multiple machines and worked on improving user experience with the frontend of the project. Blake conducted tests on different AI models to see if there was a way to improve our current model's accuracy. Jack continued experimenting with the AI model by integrating test datasets. Michael worked on increasing the precision of the model through modifications and tests. Jihun contributed to establishing the backend of the project, while also ensuring we have a usable server.

- **Past week accomplishments**
    - Eric Christensen: Worked on refactoring the model and experimented with other various models to try to improve accuracy of the model. Met with Team 45 members seperately to evaluate and compare methods of improving accuracy in order to find ways to better improve our own system. Looked into different ways to model the data to improve the system efficiency as well as accuracy.
    - Zoe Davis: Met with Michael a week ago so he could show me how to run/use the updated AI that we showed in our midterm presentation. Since then, I've been messing around with the AI to understand how it works better and have started writing actual tests for the AI to help make it better.
    - Josh Dutchik: Worked on getting the AI model set up and running on different machines for usage, worked on frontend design specifically the user account interface to make sure users are getting a positive and easy experience when using our service, helped

connect the backend code to the server when have been attempting to set up on a Iowa State virtual machine, made small database changes for an easier experience with the connections between the frontend, backend, and AI model

- Blake Friemel: Worked on testing different AI models to see if any would yield better results with our data. I also tried to tweak the parameters that the AI system considered when formulating its results to see if it could yield a better success percentage.

- Jack Gray: Made a new branch to continue experimenting with the AI model. The focus is figuring out the best way to integrate both data sets together and figure out the best way to output the results. Also still looking into how to improve accuracy. Also before we got the server was looking at backup plans for getting a server such as using amazon web services like ec2 and s3 bucket.

- Michael Koopmann: Showed Zoe the current AI model, while also working on the model itself to increase its accuracy. The AI is at 83% accuracy. Have also been creating tests for the AI to hopefully increase its accuracy. I have been tweaking and modifying the AI these past few weeks.

- Jihun Yoon: Starting to help establish backend for the project connected with the front end. Also made sure our server is established and have started working on back-to-front communication from our model to the server.

o **Pending issues** (If applicable: Were there any unexpected complications? Please elaborate.)

- Eric Christensen: No blockers, just R&D

- Zoe Davis: Was having issues running the AI but Michael helped solve those issues.

- Josh Dutchik: Some backend connections do the work and will need to be solved for a whole experience.

- Blake Friemel: I wasn't able to get additional parameters to work, other than that I didn't run into any other problems.

- Jack Gray: None

- Michael Koopmann: One hot encoding is giving an issue when doing categorical instead of binary for the allergens.

- Jihun Yoon: Was having issues with getting a server for our group, but finally resolved it.

- **Individual contributions**

NAME	Individual Contributions *(Quick list of contributions. This should be short.)*	Hours this week	HOURS cumulative
Eric Christensen	Testing/improving model accuracy	7	60
Zoe Davis	Working with AI model and writing test cases	7	60
Josh Dutchik	Frontend and Backend design and implementation	8	62
Blake Friemel	Testing different models and parameters	6	60
Jack Gray	AI model: refining and testing the AI model	6	60
Michael Koopmann	Tweaking and modifying AI	6	62
Jihun Yoon	Establishing server and backend	7	59

- **Plans for the upcoming week**
  - Eric Christensen: Continue trying to improve AI accuracy
  - Zoe Davis: Continue writing tests for the AI
  - Josh Dutchik: Fix the backend connections that are having issues and make sure all connections send the correct data to and from
  - Blake Friemel: Test the round trip capabilities of the system and address any issues.
  - Jack Gray: Test the AI model and test the front end. Add drop down list on the front end.
  - Michael Koopmann: Continue working with AI model and creating tests to help with accuracy. Hoping to implement mapping on the model (giving the parameters/information that was significant in the prediction). This will be useful for doctors so they can see why that prediction was made.
  - Jihun Yoon: Work on getting formatted, necessary information transferred between backend and frontend

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.

Midterm Feedback

Summarize the feedback you received (both written and verbal).
- Make sure that when users input their data in the front end, it is not too open ended, because the AI model cannot deal with spelling errors or any new type of data.
- The team shared different ways they increased the prediction accuracy of their model.
- They shared their concerns regarding HIPAA sharing information.

Describe any new insights your team generated based on this feedback.
- Instead of a text box for user input, have a drop-down menu the user can choose from.
- We could try using different models and combinations of models to increase our model's accuracy.

What steps are you taking based on the feedback?
- We will implement a drop-down box for our user input to prevent adding variability.
- We will test different models/combinations to see if accuracy increases.