Learning Module #9
(24 Day)

AI-Based Study Guide Creation

James

Yuliana

Honors Advanced Topics
Block C
4/12/22 - 5/20/22

Daily Log

IN SCHOOL

April 12, 2022 9:13 am - 9:45 am
Yuliana and James
Day #1
This day was spent on thinking of what app projects could be made. They decided on first revamping and adding a bunch of old projects/building them as an app-mode, and then going on to make new apps. At the time they were undecided on what app could be substantial enough to top the robot – they considered using the robot in the app.

April 13, 2022 9:13 am - 9:45 am
Yuliana and James
Day #2
Yuliana spent this day looking into Kordova and what it could do. She converted an HTML file to an app after a download, and found that the user interface could use some work. Otherwise, it appeared app development only needed HTML understanding and an ability to convert design elements to better fit a phone. This made exporting past projects easy, but they needed something new.

April 20, 2022 9:13 am - 9:45 am
Yuliana and James
Day #3
The pair thought of the idea to merge a few projects together and control the robot arm similarly to how the Pong game was controlled, using a camera and arm motion. Grip controls would be accessed by opening and closing the hand, and the arm would be able to move accordingly. They tried to account for 3D displacement and how that could be registered, but shelved that idea for when they got to it. They spent some time trying to get the robot cord unwrapped, too.

April 21, 2022 9:13 am - 9:45 am
Yuliana and James
Day #4
For this day the pair reviewed documentation. They looked at some troubleshooting for the robot and found it was strange it wasn't turning on the way it had previously. The pair spent some time researching control interfaces to use for the robot's revamped app as a baseline (as controls from an app would be a step towards their camera motion idea).

April 22, 2022 9:13 am - 9:45 am
Yuliana and James

Day #5
Today, the pair went back to the robot. They managed to plug everything in correctly and connect it to the terminal, but nowhere did any issues read. This was a problem, as there were obvious issues with its ability to power on and access commands. The gripper worked, and so power sources as fault was ruled out as an issue. They left with more questions than answers.

April 25, 2022 9:13 am - 9:45 am
James
Day #6
The pair finished working on the UI for the robot controls and would also begin looking into tensorflow bodypos for moving the robot with a user's real arms. They considered ignoring the robot counterpart completely and just trying it again once they got a program running, but upon trying a connection nothing occurred.

April 26, 2022 9:13 am - 9:45 am
Yuliana and James
Day #7
Since they were unexpectedly having issues, they would look at the wires in the back and see if anything was plugged into the wrong spot or if something was unplugged after they had moved the robot back from the library. Nothing seemed out of ordinary, and many of the wires were bolted in. No fuses were blown and all were checked for continuity.

April 27, 2022 9:13 am - 9:45 am
Yuliana and James
Day #8
On this day the pair would once again try to fix the same issues. They would look at the fuses and change batteries to see if this was the source of their problems. It turned out to *not* be the case, and instead the robot read the batteries as put in wrong (they were fine!!).

April 28, 2022 9:13 am - 9:45 am
Yuliana and James
Day #9
The pair found out we could still move the gripper so power was still going to the robot. The errors the pair were getting in the console would still change constantly, so they decided to consider new app ideas if this one did not work out. They came up with nothing, even after trying to force a power-on from the console and even manual motion felt like the robot was resisting.

May 2, 2022 9:13 am - 9:45 am
Yuliana and James

Day #10
This was the pair's final day of trying to get the arm to work. They were still having the same issues and were unable to get the arm to move. Next class they will decide what they will create for an app instead, although they have ideas to either make a functioning robot app *without* the robot or something else entirely involving revamping an old project.

May 3, 2022 9:13 am - 9:45 am
Yuliana and James
Day #11
On this day, the pair decided on what app to make. They wanted to go back to an AI focus, as that was their place of comfort. The question was what they would apply it to, as well as how they would make it differ from other projects. They settled on an app that auto-generates notes on a given topic for the user.

May 4, 2022 9:13 am - 9:45 am
Yuliana and James
Day #12
After thinking, the pair decided that the app idea they had originally come up with was too easy – it was already made, for one, and also lacked any challenge (they did trial runs with an API and found that it had essentially already been made online). They decided to rethink the app idea but still wanted to go with an AI project. Yuliana tried James' suggestion of using Cordova to make HTML files into apps, and it worked with a past HTML project she had on her hard drive. They decided to code the app in HTML for ease, then convert it to an app using Cordova.

May 5, 2022 9:13 am - 9:45 am
Yuliana and James
Day #13
The pair settled on a project involving taking pictures of notes, reading them and then making a study guide out of them. This day consisted mostly of research, where the pair looked at what different AI components would be required, what interface they wanted for the app (they settled between a dynamic and more static interface to choose between), and how it would have to communicate with James' server to get the job done.

May 6, 2022 9:13 am - 9:45 am
Yuliana
Day #14
Yuliana spent the day working on the app's design, primarily focusing on ease of access. This was done on Replit, and an unfortunate mistake came up. Although the design looked fine on the laptop, it looked choppy on the phone. This meant changing a few things to fit different screens, regardless of what the user was on. She didn't finish and took time at home to work on it.

May 9, 2022 9:13 am - 9:45 am

Yuliana and James

Day #15

Coming back to the app, the pair worked more on the interface and wrapping things up. The transitions were smooth, but there was an issue with content not showing up where they mean tot. This meant the camera and text boxes didn't appear immediately. It took a hot minute to find the proper spot to put the div, but they got to it and fixed everything.

May 10, 2022 9:13 am - 9:45 am

Yuliana and James

Day #16

With everything fixed, the pair could now move the camera into the proper position and re-adjust it to fit what they wanted. This day was spent on formatting everything else on the app, then running it on a phone to make sure everything worked.

May 11, 2022 9:13 am - 9:45 am

James

Day #17

James worked on implementing the first AI aspect of the project – scanning text. This included first capturing the image and sending it to the server, running the AI on it, and sending back a result that was a different type from the original. This was challenging and at first he only printed the address of the image, but soon it captured it. The only issue was that the generated text didn't always look pretty, which meant something had to be done about it.

May 12, 2022 9:13 am - 9:45 am

Yuliana and James

Day #18

This day was spent on furthering AI implementation, now feeding the words as generated by the server into the AI. They felt that the project stopped short and was a little bit limited (also, it printed a completely wrong response to a prompt), so they tested and fine-tuned the AI to work with what they wanted it to do.

May 13, 2022 9:13 am - 9:45 am

Yuliana and James

Day #19

The AI now printed results related to the input text, which meant everything could now be edited by the user after it was generated by the AI. This allowed the user to correct any potential errors that the AI made in its reading. This now meant that the scanning part of the app was mostly done but could still be improved somewhat.

May 16, 2022 9:13 am - 9:45 am

Yuliana

Day #20

James got the ick. This meant James would work on mostly server stuff at home and Yuliana would work on the user side of the app. Today Yuliana started setting up the main screen the user would see when opening up the app. This would lead to the page for uploading notes, creating flashcards, creating quizzes, and creating presentations.

May 17, 2022 9:13 am - 9:45 am
Yuliana
Day #21

Today Yuliana would set up some of the other screens that were needed for the app. Such as the quiz screen and the flashcard screen. These were mostly small pages that didn't require too much HTML as they are mostly just text and a few buttons.

May 18, 2022 9:13 am - 9:45 am
Yuliana
Day #22

Now, Yuliana would work on setting up the presentation screen which would have the necessary components for the AI generated presentation. This was also not too complicated of a page to create as it only was two different pieces of text, one for the name of a slide and one for the text on the slide. Also, there was an image placeholder available for if the user enables images for the presentation.

May 19, 2022 9:13 am - 9:45 am
Yuliana
Day #23

Yuliana would now set up a box that would be on the notecard, quiz, and presentation screens. This would allow for the user to pick which set of notes they would like to use to generate the various options. This would also have options relating to each screen such as amount of slides vs amount of flashcards.

May 20, 2022 9:13 am - 9:45 am
Yuliana
Day #24

Today Yuliana worked on improving the UI for the app. Yuliana improved button layout and made the buttons lead to other pages in the app. So now the main screen was fully functional. Yuliana also added and set up some fonts that would make everything look better. The UI was pretty much 100% complete now.

AT HOME

May 10, 2022 5 pm - 8 pm
James

James worked on the server that would accept images encoded in base64 and send those images to an API that Google has that converts images into text. The issue is that sometimes the text that is output by this API has a lot of errors when it comes to formatting and sometimes even has words that don't make sense or are just misspellings of words that are actually in what the desired output would be. So James decided to also have the text sent through a second AI that would take this broken text and attempt to fix the issues with it. James did this by giving the AI examples of what "fixing" the text would look like and then after would put the text that the AI should fix. The results are pretty good, sometimes the AI goes overboard but it is in mostly good condition. The server James made will send back both the AI improved text and the original Google API text and the user can decide what they like more.

May 6, 2022 6 pm - 9:30 pm
Yuliana
Yuliana spent the night working on the app's interface and transitions. Not many errors came up – this was all just building up the interface to have it look the way the pair wanted it to.

May 23, 2022 7 pm - 9:30 pm
Yuliana
Tonight Yuliana worked on some UI changes such as buttons moving to certain pages when tapped but also disabled certain buttons when they should not be able to be clicked. For example the notecard buttons that change notecards should not be able to be clicked until the note cards themselves are generated.

(MAKE-UP WORK)
May 7, 2022 6-7 pm
Yuliana
Yuliana worked on getting the button and camera to work correctly on the app. This took a while, but eventually the button worked and the camera was responsive. The issue was with it facing the wrong way – it opened up the front camera and as a "live feed" on the phone.

May 28, 2022 5-9 pm
James
James worked on the server that would accept text and from that text send it to the OpenAI API and have it create a quiz game from the text. For the most part it was simple, other than that sometimes the AI would kind of mess up and give the results in an unpredictable format that was not what the code was supposed to parse. Once that was worked out the output from the ai is parsed and is sent back to the user with an array that has questions and 1 right answer and (usually) three wrong answers.

May 29, 2022 6-8 pm

James

James worked on adding to the previous quiz server by adding functionality that could create flashcards from given text and also create presentations. James had done something like the AI presentation before so that part was fast and the flashcards took a little more time than expected just due to undesired AI output. For the most part the flashcard AI is working well but it still has some issues occasionally in that it doesn't always create the right amount of flashcards. The presentation AI also does this in that sometimes it only creates two slides instead of the desired amount but it is less common.

May 30, 2022 6-8 pm

James

Now, James would work on some final improvements for the server and would attempt to work everything out that wasn't working as expected occasionally. Most of the flaws are fixed, the desired output is given most of the time for the various options available on the server and now all we have to do is connect to our app and everything should work as planned.

Final Write-Up - Learning Module 9

Group Members' Names:
Yuliana and James

Topics Covered:
      For this learning module, we focused more on AI (this time as two separate components of the project), user interface, and free generation of information from a source (rather than just a component of something to check a condition or to play against the user). Replit was also used, its limitations tested, and Cordova was used as a converter between html and mobile app files (moreso availability – they're written in the same language but applied differently).

What was Learned:
      From advanced AI to user interface and simply *turning a camera around*, a lot was learned. Also, a lot of the problems stemmed from app versus computer programming. Although we used Cordova to transfer HTMl files over to a data pack for apps (downloadable and playable from a phone homepage rather than a site), the HTML still had to *work* with a phone. This made conscious style choices a bit difficult – without a template or projection of how it would look on a phone screen, some content looked wrong on a phone.

Problems Encountered:
      Every bit of the project had *some* difficulties, and not all of them were massive or disastrous. From design (had to fit a phone format) to AI (had to correctly analyze text and spit out the right things) to functionality (the camera opened up facing the wrong way, which was one of the major points of difficulty for the project) – everything had a bump. Getting around them was fairly easy, as both the medium and language allowed for a lot of versatility in use and many opportunities to find solutions. One

of the biggest challenges was putting everything together, but with the help of James' server it went smoothly.

Suggestions:

This was a massive project, and not everyone should immediately go for it. If someone is interested in AI then they should probably first learn about training and bias, then how they work, then finally try a project with a single (simple!) AI. Going on to something like this could lead to a lot of dead ends and failure – James had lots of experience with stitching together APIs and AI data sets, and the pair had done AI projects previously. It takes practice to get used to.

Also, sometimes taking it slow is the best approach. Truly making sure you know what code you're looking at will help prevent issues in the future. Knowing how to tell divs apart, work around different variables and alter them to your liking, and just being able to add or take away any part of code in a pinch is really important – for all projects.

Experience Summary:

It was a good closing project with botha challenge and a steady growth of knowledge since our previous projects. We explored lots of different parts of AI programs, and gained a lot of experience with HTML and building custom bits for our projects. Although it seemed similar in components, the project was ultimately something new and a great wrap-up for the year.