
EE/CprE/SE 491

Iowa State A.I. Schedule Companion

Weekly Report #1

Tuesday, January 23 - Tuesday, February 6

Group number: ssdec24-08

Client: Koby Fowler

Faculty Advisor: Abraham Aldaco

Team Members:

Koby Fowler - Overall Application Leader

Chandrashekar Tirunagiri - Frontend Design Leader

Raghuram Guddati - Backend Design Leader

Jacob Paustian - Artificial Intelligence Research Leader

Christian Deam - Meeting Manager

Anna Huggins - Team Manager/Communicator

Weekly Summary

The main objective was to familiarize ourselves with our roles and teammates and begin to perform our role's duties. Being the first week, we have to get ourselves situated with the group to work together efficiently. We managed to find our roles reasonably quickly but we're not constricted to just what we stated on paper. For example, more than one person will work on the backend, frontend, and the AI. It is just that we have stated who the leaders are in those departments.

Our primary task was creating a GitLab page for the project and filling out its skeleton. Being the beginning of the semester, we have no proper code for the project, but we are prepared to place that within. We also have constant contact with our client, have started contact with our advisor, and will set up meetings with them shortly. We have team meetings set up at a proper time and date, although meetings can be nullified if the group votes on it (if we don't have much to talk about, we don't need a meeting).

No changes were made to the project itself, as we are still in the planning phase.

Past Week Accomplishments

AWS Setup, CI/CD, GitLab, and Contacted Advisor - Koby Fowler

Over the past week, I successfully completed several crucial tasks related to our project. The primary focus was on setting up and researching AWS (Amazon Web Services) to ensure a robust infrastructure for our application. This involved configuring various services within AWS to optimize performance, security, and scalability.

In addition to AWS, I dedicated time to establishing a Continuous Integration/Continuous Deployment (CI/CD) pipeline for our application. This involved implementing automation processes to streamline code integration, testing, and deployment, ultimately enhancing our development workflow.

To facilitate collaborative development, I set up GitLab, providing a centralized platform for version control and collaboration among team members. This decision aims to enhance code management and collaboration efficiency.

Recognizing the importance of academic guidance, I contacted an academic advisor for assistance with our application. This step ensures that our project aligns with academic standards and benefits from expert insights, contributing to its overall success.

Overall, the week was marked by significant progress in infrastructure setup, CI/CD implementation, collaborative coding with GitLab, and seeking academic advice to fortify the foundation of our application development.

Frontend Design Using Figma, Next.js, and MUI Research - Chandrashekar

Tirunagiri

This week, I concentrated on laying the groundwork for our application's front-end design by creating starting templates for several crucial pages using Figma. My efforts were focused on designing the login page, home page/dashboard, and the statistics page. These templates serve as a foundational visual guide, setting the stage for the application's overall look and feel and user interaction flow.

During this design phase, I also researched Next.js and Material-UI (MUI) to understand how these technologies could be integrated into our project to enhance the front-end functionality. My investigation into Next.js covered its benefits for SEO, performance optimization, and server-side rendering capabilities, which are crucial for our application's scalability and user engagement. With MUI, I assessed how its component library could maintain visual consistency and usability across the application, aligning with the design language established in the Figma templates.

This week served as a crucial foundation for the commencement of our application, marked by extensive planning and collaborative efforts among the team.



Figure 1.1 - Figma Sketch of Login Screen.

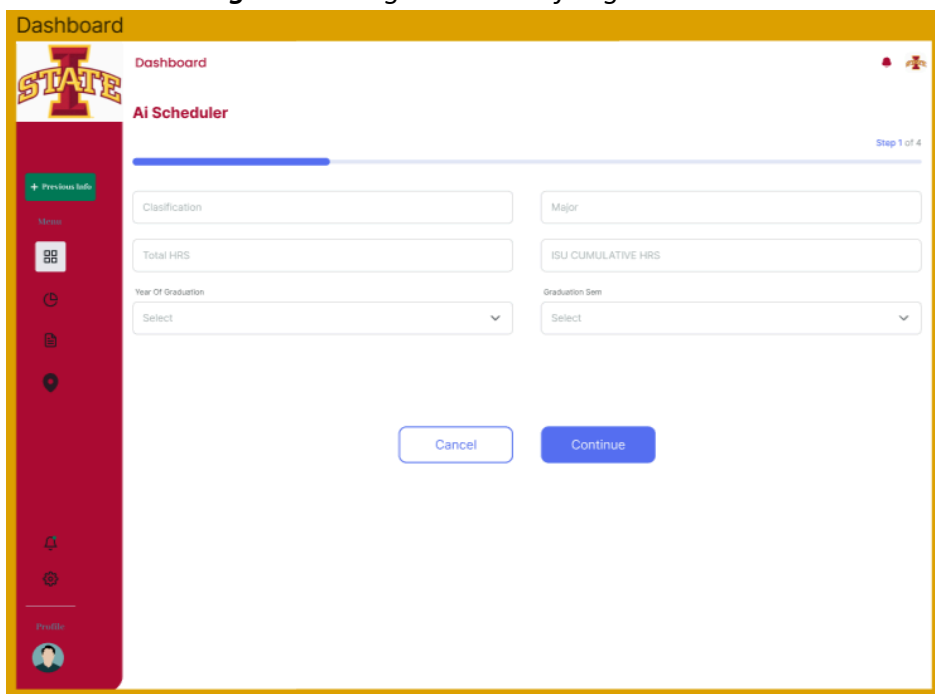


Figure 1.2 - Figma Sketch of User Input Screen.

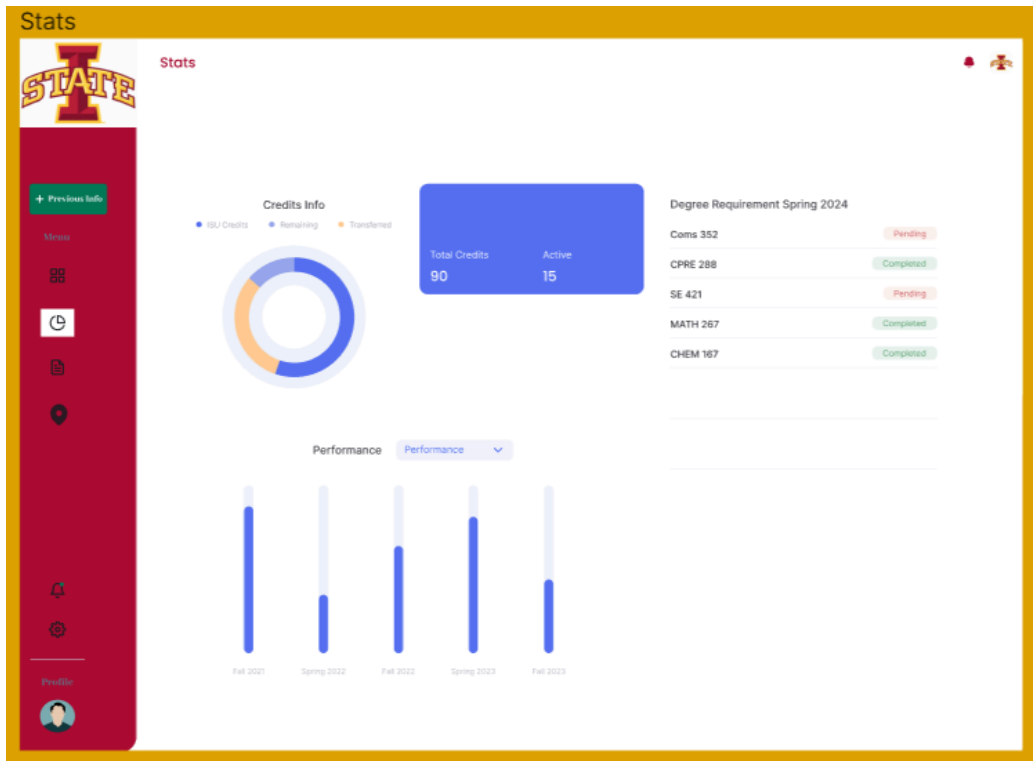


Figure 1.3 - Figma Sketch of Graphing Screen.

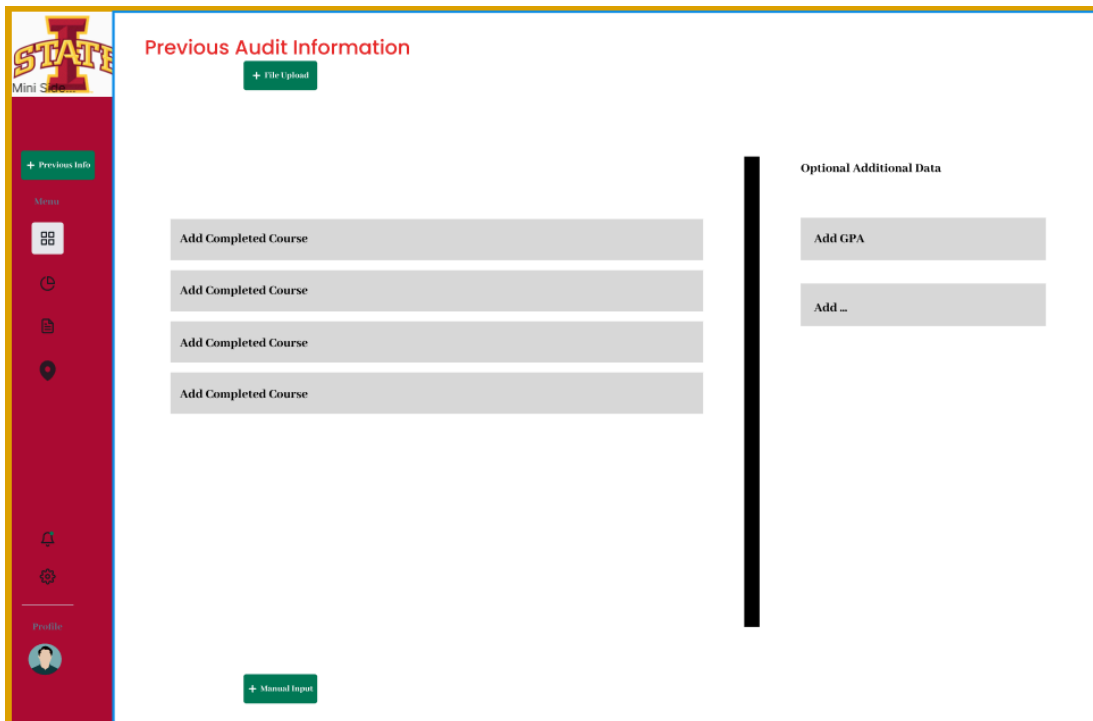


Figure 1.4 - Figma Sketch of Audit Information Screen.

Created a Few Frontend Designs and AWS Research - Raghuram Guddati

This week, I've been learning more about AWS (Amazon Web Services). Starting with a quick look at AWS's ecosystem, I started a long trip through its services. Learning the basics of Amazon S3 helped me get good at making buckets and quickly sending files to the cloud storage service. I also learned more by getting into the details of starting up an EC2 (Elastic Compute Cloud) server. This process taught me a lot about how to connect to instances using RDP and SSH (Secure Shell). These events have not only helped me get better at AWS, but they have also given me valuable skills for navigating the world of cloud computing.

I have also learned a bit about hosting our dynamic website:

Register a Domain Name:

- Choose a memorable and relevant domain name for your website.

Set Up Hosting Environment:

- Using the control panel, create a database for your dynamic website. In our case, it is PostgreSQL.

Along with learning more about AWS, I spent time drawing out the first versions of the plan selection page. These rough drafts showed how the layout and user interface parts would look. By creating different design choices, I helped speed up the scheduling process and ensure visitors could easily find their way around the page.

Research on OpenAI's GPT API - Jacob Paustian

I have been tasked with leading the project's AI research and development. Naturally, we were going to be using ChatGPT 4 for our project. As previously mentioned, we have yet to write any functional code. Instead, I have been researching how GPT's API works. Here are some key takeaways from my research thus far: (Note that this does not include how to train the AI, which I do not understand yet.)

High-Level Step-by-step on setting up GPT:

1. Create an Assistant by defining its custom instructions.
2. Create a Thread.
3. Create Messages.
4. Run the Assistant on the Thread to trigger Responses.

Assistants:

- The API is used to perform one of the following:
 - Code Interpretation
 - Retrieval
 - Function Calling
- Needs to be of a specific Model. Models include:
 - GPT-3.5
 - GPT-4
 - DALL-E
 - Whisper
 - etc.

Threads:

- Represents a conversation with the Assistant.
- Threads do not have a size limit; however, using the Assistants API means you cannot control how many input tokens are used. While running your model for more control is possible, it is apparently significantly more complex and not recommended for most use cases.

Messages:

- Contains text or files allowing the user to interact with the Assistant.
- Messages must belong to a Thread.
- [Here](#) is a list they have of all supported file types.
- Images are only supported with specific models.

Scheduling - Christian Deam

Scheduled consistent meeting times and dates (Monday starting between 4-4:30), and created template meeting minutes for future meetings.

Student Survey Draft Creation - Anna Huggins

Per our first team meeting, one of our concerns in the beginning phases of this application is creating a schedule-generating app with features users want, specifically seeking to go a step beyond normal schedule creation. In turn, I was tasked with helping bring Chandrashekar's idea to fruition- a way to gauge students' wants and needs for this project. We decided that a Google Form would be the easiest way to obtain this information.

Survey Draft:

- Created a shared Google Document with my groupmates
 - Goal: Gather potential questions for the Google Form draft
- Created the Google Form Draft #1
 - Goal: Have a visual idea of how our form will look and what questions we have so far
 - The current focus of the form is on any issues students have with the current methods of schedule generation, as well as any features they would look for in an alternative application

The following pages contain screenshots (*Figure 2.1* and *Figure 2.2*) of the survey's first draft.

Scheduling Companion Student Survey

This survey is intended to collect information for senior design project ssdec24-08, Iowa State Schedule Companion. This survey is intended to get background information from the student body regarding how they currently create their class schedules, and what features should be implemented in a new software for generating class schedules.

What problems are you facing with the current software (AccessPlus and classes.iastate.edu) for class scheduling?

Long answer text

⋮

Which of the following do you consider when creating your class schedule? (Select all that apply.)

- Time of day (morning, afternoon, evening class times)
- Location (where the class is located on campus)
- Frequency (how many times per week the class meets)
- Asynchronous or in-person (online vs. face-to-face courses)
- Other...

What features would you like implemented in a tool for helping creating a class schedule?

Long answer text

Figure 2.1 - Scheduling Companion Student Survey First Draft.

Please select the following features you'd like included in a scheduling application.

- Live scores for Iowa State sporting events
- GPA calculator
- Shortest path generator (determines the fastest route to a designated class location)
- Other...

⋮

If you would like to be a future tester for this application, please include your Iowa State University email address. (For example: jdoe@iastate.edu)

Short answer text
.....

Figure 2.2 - Continuation of Scheduling Companion Student Survey First Draft.

Later in the development of this project, this survey will have additional, more specific questions added to it, with the intent of receiving specific, clear feedback that can be used to narrow down essential features for our application.

Individual Contribution Tracker

Name	Individual Contributions	Hours this Week	Hours Cumulative
Raghuram Guddati	<ul style="list-style-type: none"> - A quick rundown on AWS. Exploring Amazon S3 and understanding how to create buckets and upload files. - Learning how to launch an EC2 instance and connect to it using SSH or RDP 	6.0	6.0
Christian Deam	<ul style="list-style-type: none"> - Created Meeting Minutes for the future meetings 	2.5	2.5
Jake Paustian	<ul style="list-style-type: none"> - Research on how to implement ChatGPT 	3.5	3.5
Anna Huggins	<ul style="list-style-type: none"> - Created a rough draft for a Student Survey - Began introductory research on ChatGPT AP 	4.0	4.0
Chandrashekar Tirunagiri	<ul style="list-style-type: none"> - Created an initial template of front-end UI using Figma (login, dashboard, stat). - Researched Next.js and MUI and how to use them in our ai-scheduling application. 	6	6
Koby Fowler	<ul style="list-style-type: none"> - Set up teams GitLab and Readme - Set up the initial application - Set up teams AWS - Set up teams CI/CD - Contact Academic Advisor to be included in advising our project. - Created a figma design for past information screen 	10	10

Plans for the Upcoming Week

Koby Fowler

In the upcoming week, the focus will be on advancing key aspects of our project. Here's a summarized plan:

1) AWS Optimization:

Continue refining the AWS infrastructure to ensure optimal performance and scalability. Conduct additional research on AWS best practices to implement improvements.

2) CI/CD Refinement:

Fine-tune and enhance the CI/CD pipeline to automate code integration, testing, and deployment seamlessly. Address any identified issues to streamline the development workflow.

3) GitLab Collaboration:

Make sure Gitlab is set up for proper workflow. (Devl -> Qual -> Prod[Main])

4) Academic Advisor Follow-up:

Schedule a meeting or follow-up communication with the academic advisor to discuss specific questions and gather additional insights. Incorporate any feedback received into the project to ensure alignment with academic standards.

5) Documentation:

Begin documentation of the AWS setup, CI/CD pipeline, and GitLab usage for future reference. Ensure that documentation is straightforward and comprehensive for current and future team members.

6) Testing Scenarios:

Identify and create additional testing scenarios to ensure the robustness and reliability of our application. Use for setting up database infrastructure.

Chandrashekar Tirunagiri

For the upcoming week, we are scheduled to meet our advisor so he can correct or suggest changes to our front-end designs, trying to complete the initial setup. I am going to do the front end of the login page. Finally, we are scheduled to learn to terraform this week, as we need that the most.

Raghuram Guddati

My plan for the next week is to start organizing the backend, considering what everyone on the team has to say. Our main goal will be to set up the rules for the back end, especially for the login feature and managing student information.

Jacob Paustian

I would like a branch, perhaps in our GitLab, that contains a very rudimentary conversation with AI. I'm unsure what it might look like, but I want to test my understanding of the API. I may also look into training the AI, but I suspect that would fall outside of the scope of just this next week.

Christian Deam

Have a meeting with the advisor and gather data from them, have a scheduled meeting and mostly talk about work to be done as a group and also about individual documentation (keeps track of what everyone did), revise meeting minutes if necessary

Anna Huggins

This week, I will put more effort toward creating Figma front-end designs in preparation for meeting with our advisor for feedback. The focus for this will be building upon our existing designs and creating other scenarios beyond login screens and the first schedule generation screen. I will also continue my research into the ChatGPT API as, later in this project, we will likely need a solid understanding of how our front-end and back-end interact with the API.