Name	Expenses	Total Semester 1 Hours	Total Semester 2 Hours	Total Hours
Kaleb Bishop	$117.50	25	95	120
Eric Buffington	$95.00	35	58	93
Hung Nguyen	$7.56	35	82	117
Matthew Bryant	$0.00	48	53	101
Total	$220.06	143	288	431

Hour Justification:

Kaleb Bishop

- Frontend Development (Semester 1: 5 hours | Semester 2: 30 hours)
  - Led the design and implementation of the app-based frontend interface. Focused on creating a clean and responsive UI that allowed users to upload food images or enter recipes. Collaborated closely with Eric to ensure that frontend elements correctly interacted with the backend services. Implemented dynamic features to display allergen detection results clearly and accessibly.
- Backend/API Development (Semester 1: 15 hours | Semester 2: 10 hours)
  - Worked on designing and building the backend API that processes input from the frontend and communicates with the model. This included creating endpoints for image and recipe input, formatting outputs, and integrating the allergen detection logic. Debugged multiple issues with the API during testing and improved stability and performance.
- AllRecipes Web Scraper & Database Integration (Semester 2: 20 hours)
  - Built a custom web scraper for AllRecipes.com to extract recipe data in a structured format. Focused on pulling essential ingredients and preparation steps while ensuring allergen-related information could be easily parsed. Integrated the scraped data with MongoDB for persistent storage, enabling the team to test and reference real-world recipe data consistently.
- Barcode API Integration (Semester 1: 5 hours)
  - Integrated a barcode scanning API that allows users to scan packaged food items to retrieve product data. Worked by querying the MyFoodData.com API to get initial food items then saved this information into our custom MongoDB database to allow for user updating.
- Image Recognition Model Training (Semester 2: 15 hours)
  - Trained a YOLO model on 125,000 AllRecipes.com images, where new images could then be classified for allergen detection.
- Model Integration & Testing Support (Semester 2: 8 hours)
  - Supported the integration of the machine learning model into the backend infrastructure. Assisted in testing the model outputs and collaborated with Eric to ensure consistent results when real-world images or recipes were submitted. Helped identify model weaknesses and proposed fixes or workarounds.

- UI/UX Collaboration & Live Testing (Semester 2: 8 hours)
    - Worked with Eric to refine UI/UX flow and conducted real-time collaborative testing during development. Ensured that design changes were intuitive and that updates worked seamlessly with the backend systems.
- Expo Preparation (Semester 2: 4 hours)
    - Prepared and coordinated final tasks leading up to the Expo. Participated in the group rehearsal session, ensured the tech setup was functioning, and helped organize physical materials used during the demonstration.

Eric Buffington

- Testing Model Output (Semester 1: 5 hours, Semester 2: 15 hours)
    - Wrote test cases that provided known food images and recipes into the model to test the model's accuracy. I then kept track of the outputs, inconsistencies, and whether the allergens were accurately shown. Finally, gave real-life inputs such as pictures of meals I've made or ordered out, and documented those results.
- Testing Backend API (Semester 1: 10 hours: Semester 2: 8 hours)
    - Worked with Kaleb & Matthew to test the backend API we made. This included submitting images or recipe text through the API, and then documenting what results we got and what results we expected. This also included providing inputs on recipes I've made and purchased.
- Testing Web Scraper (Semester 1: 10 hours, Semester 2: 5 hours)
    - Tested our recipe scraper across multiple sources like AllRecipes, Epicurious, and Food Network. Found, that the best website to use was AllRecipes because of the premade categories that we can use to ensure we check all allergens. Finally, I assisted Matthew with how to sort the data that we were taking in.
- Testing Image Processing(Semester 2: 15 hours)
    - Gathered a collection of meals and dishes to test the image processing. I then documented these results and worked with Hung and Kaleb to refine this YOLO model until it was at a satisfiable accuracy level. This also involved shopping and cooking meals that are not easily purchased.
- UI Feedback (Semester 2: 3 hours)
    - Worked with Kaleb to create a clean front end. I was testing the changes live as he made them to ensure they all seamlessly worked together.
- Team Documentation & Collaboration (Semester 1: 10 hours, Semester 2: 8 hours)
    - Contributed to our documentation repository by assisting in all written assignments and presentations throughout the last 2 semesters. This includes the graphs, posters, ReadMe, and the organization of the repository.
- Expo Preparation(Semester 2: 4 hours)
    - We all had a meeting for about 3 hours the Monday before to ensure we were all prepared for the demo we were going to perform at the Expo. I then also heavily reviewed our poster and gathered items from my house that we used at the expo.

Hung

- Text Processing Module Development (Semester 1: 10 hours | Semester 2: 20 hours)
    - I worked on building the core text processing module for our app. I set up BM25 to help with basic keyword matching and trained a BERT model so we could rank recipes based on how well they matched what the user typed in. I made sure everything connected smoothly with our recipe database and did a lot of testing to make sure the search results were accurate and useful.
- Allergen Detection Module Development (Semester 1: 8 hours | Semester 2: 15 hours)
    - I trained a Named Entity Recognition (NER) model that could find allergens in recipe descriptions. This involved a lot of data cleaning and fixing mislabeled examples before training. I tested the model using metrics like precision and F1 score, and I helped plug it into the rest of our system so it could flag allergens during searches.
- Data Cleaning & Classification (Semester 1: 5 hours | Semester 2: 15 hours)
    - Conducted in-depth data cleaning to improve model training effectiveness. I looked for infrequent or mislabeled entries that could confuse our models. This cleanup helped improve both the NER model and the ranking model, and made sure our predictions were more reliable overall.
- Tokenizer and NLP Model Testing (Semester 1: 5 hours | Semester 2: 10 hours)
    - I tested how our tokenizer worked with the rest of the NLP pipeline. This included making sure the right tokens were sent to the model during both training and when users entered queries. I worked with Kaleb to ensure that the tokenizer and database formatting stayed consistent.
- Model Integration with Android App (Semester 1: 2 hours | Semester 2: 10 hours)
    - I worked with the team to integrate trained models into the Android application's backend. I tested the full pipeline—from user input to model prediction—and making sure the output displayed properly in the app. I also worked on reducing delays and making sure the model results showed up quickly for the user.
- Model Selection and Optimization(Semester 1: 5 hours | Semester 2: 12 hours)
    - I spent a good amount of time training and tweaking different models. It took some trial and error to figure out the right setup, especially without a strong GPU. I tested different architectures and tuning options, and documented everything so we could repeat or improve the process later on.

Matthew Bryant

- Initial Design(Semester 1: 10 hours)
    - As our team didn't start with all the members we ended up with, I spent a lot of time early with Kaleb researching which tools and technologies would fit us better. I spent a lot of time reading up on various tools online
- Providing data to training program(Semester 1: 5 hours | Semester 2: 10 hours)
    - One of the foundational problems with our initial design was that we had over 40,000 recipes and only ~125,000 images. Three images per recipe on average just wasn't enough and tanked our accuracy. Trying numerous solutions to get it usable was a huge part of my responsibilities
- Formatting Web Scraped Results(Semester 1: 10 hours | Semester 2: 5 hours
    - With all the data we got from the web scraper, I put in a lot of time getting the data into a usable form. We tried various format, but eventually settled on a JSON file
- Database Design and Implementation(Semester 1: 10 hours | Semester 2 | 10 hours)
    - My primary role was in the data side of the project. Much of my work never saw the light of day because it was just not correct for our use case, specifically in regards to a lot of the SQL work. What made it in that I worked on was the mongoDB and JSON formatting via python, but the failed work in SQL taught us important info for finishing the project
- Assignments(Semester 1: 5 hours | Semester 2: 5 hours)
    - Various assignments given by our advisor took a total of a handful of hours each semester
- Data Refinement and Categorization(Semester 1: 3 Hours | Semester 2 | 10 hours)
    - The final implementation of our web scraped data involved 250 distinct categories of food instead of trying to dilineate every single type of cookie from one another. I spent a few hours with this idea in the fall before returning to it in the Spring
- Expo(Semester 2: 5 hours)
    - Attended the expo and presented to judges
- Meetings(Semester 1: 5 hours | Semester 2: 8 hours)
    - We met more frequently as time went on, and those meetings were usually spent on getting our individual tasks synchronized and communicating with each other, not development work

Expense Justification:

Kaleb Bishop:

- Apple Developer ($100)
- Electricity in GPU usage ($7.50)
- Bake sale Expo example items ($4)
- Google Translate API usage ($2)
- Proxy Server for local API ($3)

Eric Buffington:

- Ingredients to make meals at home ($35)
- Ordering meals to test at restaurants ($60)

Hung Nguyen:

- GPU Server Training: (0.12 $/hr * 63 hr = $7.56)

Matthew Bryant:

- N/A