

Computer Science Education Game

Team GJC

<https://github.com/JakenW/Computer-Science-Education-Game>

Christina Kong (ctk2@hood.edu); Grayson Swift (gls15@hood.edu); Jaken Whipp (jaw32@hood.edu);

WEEK OF MAY 2 - MAY 9

A. Weekly Accomplishments

Describe what task was completed and by whom. Complete sentences, paragraphs, and explanations are required. In parenthesis, provide the number of hours the team member worked on the specific task.

- 1) I worked alongside Christina to fully integrate the question code to be both dynamic and on the same page as the visual novel code which displays a background as well as a character portrait. The user is now asked questions based on the database. To return to the canvas based game, the user will have to click a button below the question window, this is due to not fully understanding how to have JavaScript auto direct them back as the question code utilizes an array-like structure. (Jaken Whipp and Christina Kong, 1.75 hours)
- 2) I integrated buttons below the open-world canvas game which allows the user to “fast travel” to the various locations we included within our game. This was included as a work around to doing map traversals as it did not get implemented within the JavaScript code. When a user clicks the button for a specified location, the page will redirect them to a new route which contains an html file specified to the selected location. (Jaken Whipp, 0.5 hours)
- 3) I have implemented the final versions of almost every page and have ensured that they are all still fully functional. The home page, various forms for creation, and puzzle pages have all had their final versions implemented and are functional. There are some small things which need to be done to the canvas game pages, however they will be completed prior to the presentation on May 12th. (Jaken Whipp, 2 hours)
- 4) I integrated a small tweak to the puzzle code so that marked spaces (pink spaces) can be unmarked (back to white/blank) by alt-clicking them again as opposed to needing to be left-clicked (which would show if it was right or wrong). This change was essentially as marking should be used to plan out whether an idea for how the puzzle solution might look and marked spaces need to be able to be unmarked. I have also verified the code does not allow the user to mark spaces already identified as correct or incorrect. (Jaken Whipp, 0.25 hours)
- 5) I fixed the backgrounds for the open world game so they were 15 x 16 pixels, and added an additional location. I finished the art for the visual novel environment. The artwork for characters are being fixed, and are going to be formatted correctly and have transparent backgrounds. I also have prepared some dialogue for when the user interacts with the standalone non-playable characters throughout various locations. (Christina Kong, 3 hours)
- 6) Worked on the improved code to perfect any clipping issues and ensure interactivity when required. (Grayson, 4 hours)

B. Problems/Issues

Describe the problem/issue, who is working on it, what the cause is, what has been tried to solve it, expected resolution. Complete sentences, paragraphs, and explanations are required. Explain how it may affect the project schedule.

- 1) While I do not have outstanding issues, I just thought it would be worthwhile to mention some of the issues I encountered while integrating final versions of webpages as, to me, it does not seem like a task which would take 2 hours. The two biggest issues I encountered was a clash between Christina’s styles.css and the styles declared within the style tag on HTML for the puzzle pages. To fix the conflicting styles, I had

to slowly add and remove aspects within the css to finally get the puzzle centered as well as having the navbar not be centered on the page but be left aligned and span across the top of the page. This issue was not super complicated, but added to the general length of the task. The other issue I encountered was that the post on creating the puzzle started to give a 404 not found error. This one took me a bit of time to decipher its source, but I ended up realizing I did not change the route specified as the action within the HTML form. Once I made this change, the finalized version of the create puzzle page worked as intended. Both of these issues were resolved, but fixing them probably made up at least 1 of the 2 hours spent on the task. (Jaken Whipp)

- 2) Only frustration encountered was bug testing code this week. (Grayson)

C. Next week's planned work

What do you plan to work on next week? Complete sentences, paragraphs, and explanations are required. If you have pending issues from section B, how will they affect next week's plan?

- 1) While there are no more weekly reports scheduled to be submitted prior to the final delivery presentation, there are some things I intend to do prior to the final delivery. I plan to add a small control explanation below the puzzle on the play puzzle and create puzzle pages. Secondly, I plan to put finishing touches on the game pages so that Grayson's new code works for the various map locations as well as updating dialogue on each page to represent the npc in the location asking for assistance.
- 2) I plan to do any finishing touches to the game's website and general art for the game. (Christina Kong)
- 3) Working to make sure that everything we have looks presentable. Meeting with the group to make sure we cover all presentable points. (Grayson)

D. Time log

Total Number of Hours worked on the project this week per team member.

Kong: (4.75 hrs), **Swift:** (4 hrs), **Whipp:** (4.5 hrs)

Total Weekly Team effort: 13.25 hours

WEEK OF APR 25 - MAY 2

A. Weekly Accomplishments

Describe what task was completed and by whom. Complete sentences, paragraphs, and explanations are required. In parenthesis, provide the number of hours the team member worked on the specific task.

- 7) I have implemented a functioning page which utilizes the puzzle page set up so that the user can create their own puzzle using the grid instead of solving a puzzle. When the user clicks submit, the puzzle is sent to the Flask backend where the string is modified so that it can be stored within the SQL database. (Jaken Whipp, 4 hours)
- 8) I have also implemented a page which serves as a puzzle library, or directory. When the user goes to this page, an image of a blank grid is shown alongside the puzzle's number and a play button. When the user clicks play for one of the puzzles, they are then redirected to the page which allows them to try and solve the puzzle. (Jaken Whipp, 1 hour)
- 9) I reworked the make puzzle page and play puzzle page. Alternate click was removed from make puzzle as there is no reason to mark spots when they are deciding which spots are part of a solution. Additionally, functionality was implemented to prevent the user from submitting an empty puzzle. The play puzzle page now tells the user whether a selected spot is right or wrong based on whether it is green or red. Additionally, when playing the number of errors the user makes is tracked and tells them how much they messed up when they finish. (Jaken Whipp, 30 minutes)
- 10) I worked on drawing character portraits for the visual novel environment. I also worked on backdrops for each non-playable character, which are gradients of different colors that match to its particular character. I also worked on character sprites. (Christina Kong, 1 hour)
- 11) I worked on and finished the pages for the game's website. Each page uses a dedicated CSS page, and has art for the game displayed on the homepage. I edited the navigation bar, so that it is displayed throughout all pages as well as fixed editing the page where the game is held. One of the buttons for "puzzles" of the navigation bar has a drop down menu for the puzzle directory. (Christina Kong, 1 hour)
- 12) I worked on dialogue for the game. This includes dialogue between the player and non-playable characters. (Christina Kong, 30 minutes)
- 13) I changed movement from the illusion of moving by just moving the background to being able to move the character sprite across the screen. I also have implemented a border to the canvas image so that the player can not move outside the bounds. (6 hours, Grayson)

B. Problems/Issues

Describe the problem/issue, who is working on it, what the cause is, what has been tried to solve it, expected resolution. Complete sentences, paragraphs, and explanations are required. Explain how it may affect the project schedule.

- 3) Several issues were encountered when trying to work through the page which allows the user to make the puzzles. All of these issues were eventually resolved, but in short they included code 500 server errors, trying to determine what data was being received by the backend, trying to troubleshoot Flask preventing printing to the console when running (eventually circumvented using an external file and using the logging library). These issues were all eventually resolved, so I will not go on a harangue about all of them. All in all, they lengthened the creation of the page, but have been resolved and the page is working smoothly. (Jaken Whipp)
- 4) An issue I encountered right before writing this is that when using alternate click the user cannot unmark a marked spot with the alternate click. I believe this should be simple to fix as I should only need to add

another if condition to the JavaScript code which allows pink tiles to be changed back to white if an alternate click is used on them. (Jaken Whipp)

- 5) I have been working on improving movement in the overworld. I spent much of my time bug fixing after changing specifics but I believe that it has worked out for the better. (Grayson)

C. Next week's planned work

What do you plan to work on next week? Complete sentences, paragraphs, and explanations are required. If you have pending issues from section B, how will they affect next week's plan?

- 4) I plan on working together with Jaken to incorporate map traversals, where a character can "fast travel" to different locations of the open-world environment. We also plan on working on combining the questionnaire dialogue box with the visual novel environment. (Christina Kong and Jaken Whipp)
- 5) I plan on finishing art for the game. This includes character portraits for the visual novel environment, and character sprites. I also plan on finishing the game's dialogue. This includes interactions between the protagonist and the non-playable characters. (Christina Kong)
- 6) Aside from the work Christina and I plan to do together, I intend to fix the small issue with alternate click marking on the play puzzle page. Additionally, I plan to make the question dialogue box code dynamic which should not be too difficult as it should follow a similar process as the puzzle pages did with passing data to JavaScript on the front-end. I would like to try to do something with the puzzle so it resets when the user makes too many errors (which I tried but after resetting the board it stopped them from being able to interact with it altogether). However, I am not sure that is "essential functionality" so I will come back to it if I have time. Otherwise, there are smaller things I should implement on forms so that users cannot submit questions with blank fields or account/registration forms with blank fields. Besides that, I plan to help with any remaining canvas work so that it functions in time for the project. (Jaken Whipp)

D. Time log

Total Number of Hours worked on the project this week per team member.

Kong: (2.5 hrs), **Swift:** (6 hrs), **Whipp:** (5.5 hrs)

Total Weekly Team effort: 14 hours

WEEK OF APR 18 - APR 25

A. Weekly Accomplishments

Describe what task was completed and by whom. Complete sentences, paragraphs, and explanations are required. In parenthesis, provide the number of hours the team member worked on the specific task.

- 14) I have continued the work on finishing the nonogram puzzle part of the project. Firstly, I continued work on it by going through all the code and tested all the functions piece by piece to determine which were working and which had issues. Through this process, I was able to get the puzzle aspect of the game functioning. (Jaken Whipp, 1.25 hour)
- 15) I finally went back and added functionality on the website so that questions can be created through the webpage and then placed within the database. (Jaken Whipp, 0.75 hour)
- 16) I worked alongside Christina to implement her previously created code for a visual novel and question answering dialogue box so that it functions properly through the website, there were some small difficulties due to flask but they both work. (Jaken Whipp & Christina Kong, 1 hour)
- 17) I implemented the puzzle to function dynamically based on the puzzle taken from the database. The functions work for the solution taken from the database and the labels for the puzzle are also dynamically computer based on the puzzle which has been selected. Additionally, figuring this out has provided helpful insight about passing objects from the Flask backend into the scripts contained within the various HTML files. (Jaken Whipp, 1 hour)
- 18) I continued working on drawing art for the video game. This includes portraits for the characters, backdrops for the visual novel environment, and backgrounds for the open-world environment. (Christina Kong, 1 hour)
- 19) I finished up the homepage for the video game. I tweaked the navigation bar, added art for the game, and added features like a play now button that directs the user to the game page and a slideshow where screenshots of the game will be held. I will be adding screenshots of gameplay in the future. (Christina Kong, 1 hour)
- 20) I was able to work with Christina in order to fix and fully implement a dialogue system that transitions smoothly through gamestates. I also found a way to implement a change map event that can be triggered when the player walks through doorways. (Grayson 3 Hours)

B. Problems/Issues

Describe the problem/issue, who is working on it, what the cause is, what has been tried to solve it, expected resolution. Complete sentences, paragraphs, and explanations are required. Explain how it may affect the project schedule.

- 6) The functionality issue with the nonogram puzzle ended up being due to how the puzzles were represented in the code. The approach I based ours on had it as an 11x11 grid instead of 10x10 as they were accounting for the unplayable rows which held the labels. Once figuring this out, it became easy to troubleshoot and eventually fix the functionality of the puzzle page. This issue is resolved but I thought it was worth mentioning as it was one which persisted from last week. (Jaken Whipp)
- 7) There are two smaller issues which still exist with the puzzle page. The first is that the current box which holds the label has a strange appearance due to the way the labels are passed from the backend. When the label is hard-coded, a line break can be added so that the two numbers are atop each other. However, when done dynamically, the two numbers are in the same string which causes a strange issue. While it would be nice to fix this, I will put it on the backburner for now as the page still functions and it is not as high a priority as getting other pieces implemented. The other small is that currently the user can just select any position they want even if it is wrong. I would like to modify the code so that if a incorrect spot

is clicked it will be marked red so the user knows it is wrong. The page still functions as they will not be marked correct unless the board exactly matches the solution (if they select all squares it will not tell them they are correct the gameboard and solution must be a 100% match for the page to notify them they won). (Jaken Whipp)

- 8) I had issues with CSS where the style for certain objects of a page would not be formatted correctly. I solved this by separating the two elements I wanted into their own .html pages, and fixed the single CSS stylesheet. After putting them together, the formatting was correct. (Christina)
- 9) The title screen implementation has been difficult to fully integrate, with the hope being that it can be kept in a single web page but many of the methods that I attempted to keep the experience within the same page have issues running while switching web pages has been successful. This shouldn't affect the timeline of the project and if it becomes more trouble than it is worth we have an alternative. (Grayson)

C. Next week's planned work

What do you plan to work on next week? Complete sentences, paragraphs, and explanations are required. If you have pending issues from section B, how will they affect next week's plan?

- 7) Next week I plan on tweaking the puzzle code to display correct and incorrect spots in red and green respectively and to not let the user try to select a box which has already been denoted as correct or incorrect. I also plan to experiment with combining the visual novel element with the question dialogue box which will allow for the user to answer questions during their conversation with an NPC. Furthermore I plan to integrate the question dialogue box to have questions and answers which come from the database. (Jaken Whipp)
- 8) I plan on finishing and reworking the backgrounds for the open-world environment. This entails simplifying backgrounds, adding collision/boundaries, and finishing the last backgrounds for locations like the second classroom, hallway, and library. I also plan on finishing the sprites for all the characters which includes the protagonist, and non-playable characters. Game art assets will continue to be worked on and finished up. Dialogue for the game is still being worked on. (Christina Kong)
- 9) I'll try to keep the game on the webpage, but it is possible that I alter course and have it traverse webpages. (Grayson)

D. Time log

Total Number of Hours worked on the project this week per team member.

Kong: (3 hrs), **Swift:** (3 hrs), **Whipp:** (4 hrs)

Total Weekly Team effort: 10 hours

WEEK OF APR 11 - APR 18

A. Weekly Accomplishments

Describe what task was completed and by whom. Complete sentences, paragraphs, and explanations are required. In parenthesis, provide the number of hours the team member worked on the specific task.

- 21) A table within the database has been created to store relevant information to the nonogram puzzles. Information stored within the table includes the puzzle's id number (primary key) and information row information for 10 rows. Each puzzle will be on a 10x10 grid. (Jaken Whipp, 45 minutes)
- 22) An initial test page for the puzzle functionality has been created and implemented so that it can be accessed and used through the front-end web pages. However, this original test page is still a work in progress and needs to be expanded to be dynamic for the puzzle passed to it as well as some other issues which will be explained within section B. (Jaken Whipp, 2 hours)
- 23) The design of the pages for the game's website have been finalized. This includes the theme, CSS file, game art cover, and a navigation bar. Pages are subject to change due to possible changes to formatting. (Christina Kong, 1 hour)
- 24) Art for the game including character assets, backdrops, and dialogue boxes have been started. (Christina Kong, 30 minutes)
- 25) The writing for dialogue between the teacher and non-playable characters is in progress. The dialogue has also been successfully implemented into the dialogue box choices code. The player can now progress through dialogue and be able to select choices. Each choice will direct them into a different path. If answered correctly, the player will proceed. If answered incorrectly, the dialogue between the player and non-playable character will end. (Christina Kong, 1 hour)
- 26) I was able to set up a progress flag system that will indicate various signs that the player has progressed within the level. I also researched and tested but did not implement a title screen for our game as well as a pause menu. (Grayson Swift 2 hours)

B. Problems/Issues

Describe the problem/issue, who is working on it, what the cause is, what has been tried to solve it, expected resolution. Complete sentences, paragraphs, and explanations are required. Explain how it may affect the project schedule.

- 10) When it came to storing puzzles within the database, the python lists could not be stored in a nice manner within SQL. To address this issue, I had to do some supplemental research and then some experimentation with how to go about storing the puzzle. I decided to split each row into its own item within the table; however, each row was still represented by a list since the original puzzle is a 2-dimensional array utilizing python lists. As such, my approach was to convert the lists into strings with each specific square of the puzzle being separated by a space. Additionally, I created code which would convert these strings back into integer lists and put them back into a 2-dimensional list to be passed to the HTML/JavaScript frontend. This issue has been resolved and the puzzles can be stored and retrieved from the database (Jaken Whipp)
- 11) One issue with the test puzzle page involves passing the puzzle from the backend to the frontend. The puzzle needs to be accessed within the JavaScript code on the page, however I have not been able to pass it properly yet. I have done some supplemental research and experimented with a couple approaches I read about, but I have yet to pinpoint why it is not working. Currently, this issue is still being resolved and I hope through utilizing console logging and other approaches I will be able to have the puzzle passed to the frontend so that it can properly be utilized by the JavaScript code. (Jaken Whipp)

- 12) The second issue with the test puzzle page is that clicking the squares does not indicate whether it was a correct location within the puzzle or an incorrect one. I know which piece of the JavaScript code handles this task and have an idea about how to change it so that this is not an issue, but have yet to actually implement it. Additionally, the function which checks whether the solution and input on the board match currently does not work so I need to do some troubleshooting on that as well so that the page will tell the user when they have solved the puzzle. Both of these issues are still currently being worked on. (Jaken Whipp)
- 13) As it is getting down to our launch date it has become important to prioritize tasks and features and identify if there are any that are unnecessary or will not be able to finish on time. I have been able to isolate some aspects on my end, but in total I don't believe it will affect the project schedule as the non-implemented features are not integral for the game's stability or usability. (Grayson)

C. Next week's planned work

What do you plan to work on next week? Complete sentences, paragraphs, and explanations are required. If you have pending issues from section B, how will they affect next week's plan?

- 10) Ideally, I plan to finish the puzzle implementation which will require fixing some issues described above when it comes to the functionality of the page. Once the initial gameplay issues are fixed, I plan to then work on making the initial test page dynamic so that it will automatically work for any puzzle within the database. Moreover, I plan to implement a library page where a user can view all of the puzzles currently stored within the database as well as a page which will allow the user to create a puzzle themselves to be stored within the database (but this one may not be added as it is less essential). Finally, I plan to re-implement the creation page for multiple choice questions so that questions can be added to the database for use, if time permits I will also experiment with adding an option to upload a csv file with questions, but it may not happen as prioritizing the games functionality is more important. (Jaken Whipp)
- 11) I plan to work on the user to npc interaction where the player interacts with a non-playable character and it will prompt a switch to the visual novel environment. This switches from the open world to the visual novel where the player sees the non-playable character's portrait art and dialogue. I will also finish up on art assets for the game environment, which includes backdrops and the rest of the non-playable characters. (Christina Kong)
- 12) The plan for next week is to attempt to get a running version of our game going, not with all of its functionality but enough to allow for bug testing. (Grayson)

D. Time log

Total Number of Hours worked on the project this week per team member.

Kong: (2.5 hrs), **Swift:** (2 hrs), **Whipp:** (2.75 hrs)

Total Weekly Team effort: 7.25 hours

WEEK OF APR 4 - APR 11

A. Weekly Accomplishments

Describe what task was completed and by whom. Complete sentences, paragraphs, and explanations are required. In parenthesis, provide the number of hours the team member worked on the specific task.

- 27) Preparation/supplemental research into how to implement a nonogram puzzle using HTML and JavaScript. Through looking into other people's methodology about implementing a single, hardcoded nonogram puzzle through HTML and JavaScript I have ideas about how to implement nonogram puzzles in a fashion which will be dynamic for the puzzle accessed from the database. By passing three separate pieces of information from the backend (the horizontal labels, the vertical labels, and the original puzzle) it should be possible to implement the puzzles in a way which is not restrictive to a single puzzle. (Jaken Whipp, 1 hour)
- 28) Worked on connecting the questions dialogue with the visual novel/canvas environment. Attempted by combining code, in the Javascript file, and editing the CSS file to fit the formatting of the questions properly onto the visual novel environment. (Christina Kong, 1 hour)
- 29) Worked on adding boundaries/collisions to finished backgrounds for the game environment. (Christina Kong, 45 minutes)
- 30) Research and tested out a method for transporting the character between environments. (Grayson Swift, 1 Hour)

B. Problems/Issues

Describe the problem/issue, who is working on it, what the cause is, what has been tried to solve it, expected resolution. Complete sentences, paragraphs, and explanations are required. Explain how it may affect the project schedule.

- 14) There were issues with combining code from two different Javascript files. In order to display dialogue properly onto the visual novel environment, the original dialogue layout for the visual novel environment had to be altered and changed to match the style and CSS of the questions dialogue boxes. (Christina Kong)

C. Next week's planned work

What do you plan to work on next week? Complete sentences, paragraphs, and explanations are required. If you have pending issues from section B, how will they affect next week's plan?

- 13) I plan to actually have the puzzle entirely implemented within the upcoming week and would like to include a page on the site which will allow users to create their own puzzles. I believe I should be able to complete both of these tasks and any remaining time I have will go towards creating a part on the website to allow for the creation of questions or the reading of the questions from a .csv file. Additionally, I would like to work on accessing text data of questions from the database and displaying it within the canvas environment. (Jaken Whipp)
- 14) I plan to continue finishing up combining the visual novel environment with the questions dialogue box. I also plan on finishing adding collisions to the backgrounds, so I can work on more backgrounds for the rest of the planned locations. (Christina Kong)
- 15) I will be helping Christina so that she can focus on the art aspects and be starting a preliminary script of the story and characters. I will also assist my team members with tasks if they require it. (Grayson Swift)

D. Time log

Total Number of Hours worked on the project this week per team member.

Kong: (1.75 hrs), **Swift:** (1 hrs), **Whipp:** (1 hrs)

Total Weekly Team effort: 3.75 hours

WEEK OF MAR 28 - APR 4

A. Weekly Accomplishments

Describe what task was completed and by whom. Complete sentences, paragraphs, and explanations are required. In parenthesis, provide the number of hours the team member worked on the specific task.

- 31) The user creation form and functionality was improved through MERN. Prior to the presentation, the user creation form lacked a password and confirmed password field. Additionally, the form was lacking functionality which would prevent users from creating accounts when they had not fully filled in the form, had a password not match the confirm field, or notify them when an account with the same name already existed within the database. The code now has functionality for these issues when the form is submitted and the form has been adjusted to contain these additional fields. (Jaken Whipp, 1.5 hours)
- 32) The work done through canvas has, finally, been connected to the frontend and can be used through the webpage. Several issues and errors were encountered through this process and substantial research about correcting these errors was required. Most of the troubleshooting done to implement the canvas work was using the new MERN code, however the canvas work ended up being implemented through the original Flask work which we had swapped from weeks ago. However, the way of implementing it in Flask has solved the problem with getting the canvas hooked up which persisted across both languages and should be influential with progressing the continued development of the game. (Jaken Whipp, 4.25 hours)
- 33) Researched about map collisions/boundaries and user-to-npc interaction. Started working on the finished backgrounds and began adding collision tiles. These collision tiles were placed on areas like walls and furniture to ensure that the user will not be able to walk through objects or on walls and ceilings. (Christina Kong, 2 hours)
- 34) Created a visual novel environment that displays dialogue on canvas, as well as a background and the character's portrait. This approach showcases a potential way to display dialogue and a conversation between the user and the npc. (Christina Kong, 1 hour)
- 35) Created a question interface that contains a question, and four options for answers in one dialogue box. This is a potential way to display Computer Science questions. If a user selects the correct answer they will proceed to the next question. If the user answers incorrectly, the questions start over. (Christina Kong, 1 hour)
- 36) Research and implement techniques to prevent graphical glitches and improve user experience. (Grayson Swift, 2 hours)

B. Problems/Issues

Describe the problem/issue, who is working on it, what the cause is, what has been tried to solve it, expected resolution. Complete sentences, paragraphs, and explanations are required. Explain how it may affect the project schedule.

- 15) Several errors were encountered when working on the improvement of user creation. Firstly, there was an issue with figuring out why the validator library was causing errors with the `isLength` function when trying to ensure usernames and passwords were a certain length. After looking at the official documentation, I could not figure out why this was an error so I took a different approach for improving functionality of the user creation form by just using the form data and comparing its length with the built in function (which in hindsight makes much more sense). Another issue existed with the form data not posting to the database properly, but this was because I forgot to change one of the input fields to correspond to the correct attribute. These issues were encountered by Jaken and were resolved.

- 16) Several different issues were encountered when trying to get the canvas to function properly within the application. One key issue was my lack of understanding when it came to canvas and the way in which react functions. Using canvas through react requires the canvas to be its own component/element. There is not an issue with this, until it comes to implementing specific functions which are required for the functionality of the game. Trying to set the background image caused the page to stop working every time. Firstly, the page did not know where the image was. I broke down this problem into steps. To begin solving this, I attempted to display any image on the webpage. When doing this through the HTML in the return statement it would not show the image when the explicit file path was specified. To solve this, the image needed to be imported at the top of the javascript file and then referencing it within curly braces as the source in HTML. This produced the idea of running the game script in a similar fashion by importing it and referencing it in a HTML script tag. However, this approach produced several errors and would constantly keep producing them due to the nature of how the animate function in the script was called. Secondly, I attempted to solve this issue by manually assigning the image within the draw function for the canvas. This attempt, to me, seemed like it would work however there were errors saying it was not in an acceptable image format for canvas. To attempt to solve this issue I went to the canvas documentation to look up which images were acceptable. By following the website's advice, I had included an image in a way which would have made it acceptable to canvas, however the issue still persisted. I also tried to reverse engineer an example I had seen online which produced a pulsating orb within the canvas. However, they did not show how to include images at all so this method proved troublesome and confusing. Another way I tried to implement the canvas was by putting all the code for the game script within the HTML return section within a script tag. Alas, this did not produce the desired result either. The approach of putting the entire game script in an HTML tag had not been one I had tried in Flask, and had thought was work as soon as I considered it. After going back to Flask and doing some refactoring of the game script, the original canvas work could be run through Flask. As such, the issue of not getting the canvas to function properly on the web environment has been fixed. However, it has produced the strange side effect of switching from Flask to MERN and now back to Flask. Additionally, there were some other ways I attempted to solve this issue, but I had not documented them well enough to describe. These issues with implementing the canvas environment with the webpage were encountered and solved by Jaken.

C. Next week's planned work

What do you plan to work on next week? Complete sentences, paragraphs, and explanations are required. If you have pending issues from section B, how will they affect next week's plan?

- 16) As for next week, I would like to begin working on the puzzle functionality so that the player can actually play the puzzle aspect of the game. Additionally, if any assistance is needed with the collisions, interactions, or traversing, I am willing to look into how to do that with canvas as well. (Jaken Whipp)
- 17) Next week, I will work on combining the visual novel environment with the questionnaire dialogue box. Combining both aspects will allow the user to see the npc they are speaking to while answering the computer science questions. This will also allow the user to pick dialogue options. I also plan on finalizing the designs for the pages of the website. (Christina Kong)
- 18) During the next week I will be trying to find a way for the core gameplay loop to transition to the visual novel environment that Christina worked on. I also plan to work with Jaken to ensure a smooth connection from the front and back end. (Grayson Swift)

D. Time log

Total Number of Hours worked on the project this week per team member.

Kong: (4 hrs), **Swift:** (2 hrs), **Whipp:** (5.75 hrs)

Total Weekly Team effort: 11.75 hours

WEEK OF MAR 21 - MAR 28

A. Weekly Accomplishments

Describe what task was completed and by whom. Complete sentences, paragraphs, and explanations are required. In parenthesis, provide the number of hours the team member worked on the specific task.

- 37) The initial connection to the MongoDB Atlas was established and the new backend utilizing express was set up. (Jaken Whipp 1.75 hours)
- 38) The front end was set up so that pages could be displayed and a navbar was created to navigate to the different routes/pages which are included within the software. (Jaken Whipp 1.5 hours)
- 39) Create functionality implemented through the front end so that the software's users could create accounts and so that they could create questions, both of which were stored within the MongoDB backend. This task is still in progress as currently the account creation does not account for a password nor does it have logic for verifying the password and password confirmation fields match. (Jaken Whipp 2.5 hours)
- 40) Worked on interaction and further implementing a map for the game (Swift 2 hrs)
- 41) Implemented the background of the teacher's office for the game's environment. This allows the user to be able to navigate through the location. (Christina Kong, 1 hour)
- 42) Investigated implementing map boundaries/collisions. implementing object interactions alongside the dialogue associated with the interaction, and navigating to a new location on the map through interacting with an object/door. (Christina Kong, 2 hours)

B. Problems/Issues

Describe the problem/issue, who is working on it, what the cause is, what has been tried to solve it, expected resolution. Complete sentences, paragraphs, and explanations are required. Explain how it may affect the project schedule.

- 17) A problem encountered when doing the groundwork for the project in MERN was an issue related to the execution policy in the powershell. The software was running into errors until the execution policy was changed. Once changed, the software no longer encountered this error. Overall this error was not complicated to fix, but just added to the general slowdown of things. This problem was encountered and solved by Jaken.
- 18) Another issue which was encountered while working related to a new release of react-router-dom, specifically v6 compared to v5. Some advice about how to do routing, and the way in which routing was done on some older coding projects, was using information relevant to v5 of react-router-dom. However, there were some large changes between the two versions and some naming conventions of the older version were no longer used in the new version. There was a YouTube video which highlighted some key differences between the two which was helpful in resolving the issue. This issue was encountered by Jaken and required some additional research, however after enough research it was solved and the project was able to continue progressing.
- 19) Some issues were encountered throughout the CRUD process for questions and users, however all of them were solved after enough research, experimentation, or code changes. The first issue was related to requests not posting with errors saying they were bad post requests. This issue persisted regardless of how the post was made, whether by axios or by using the fetch method. This issue eventually was solved after looking through several YouTube tutorials of people doing CRUD in MERN and experimenting with their approaches. Some approaches used by people within videos would still cause the issue. Honestly, why the issue was occurring is still somewhat of a mystery, however it was able to be resolved. Another

issue involved the incorrect naming of a file path which went unnoticed for longer than I would like to admit. The name of the file had a “./” when it should have just been a “/”. This issue caused problems with CRUD functionality on questions for a substantial amount of time but was eventually resolved. Both of these issues were encountered by Jaken and were resolved.

- 20) There were compatibility issues with implementing code to our initial Javascript program. Resources that incorporated map boundaries/collisions started from scratch, so it was difficult incorporating the same code to our pre-existing lines of codes since there are slight differences in the functions. For instance the function for moving the player through the map on keydown was slightly different across tutorials, so it was hard to connect our existing function for player movement to the code for boundaries. Map boundaries/collisions are important, so that it restricts the user’s movement when it comes to traversing through an environment. For instance, creating collision blocks on ceilings, walls, or furniture will prevent the player from phasing through the object. These compatibility issues were encountered by Christina Kong and are still working on being resolved.

C. Next week’s planned work

What do you plan to work on next week? Complete sentences, paragraphs, and explanations are required. If you have pending issues from section B, how will they affect next week’s plan?

- 19) Next week I plan to integrate the canvas work onto the webpage. I plan to start this process prior to the Midterm Presentation as it would be nice to showcase the canvas’ functionality and have it be already, at least partly, implemented on the webpage. Additionally, I plan to finish implementing the password fields on the create user page and implement the logic to only create the user’s account when the two password fields match one another. There are no outstanding issues from section B which will affect either of these plans. (Jaken Whipp)
- 20) Next week, I plan to add collision blocks to all the backgrounds for the game. This includes the already made locations; the teacher’s office, school hallway, and classrooms. Future locations will have collision blocks as well. I also plan on implementing player-to-npc interaction, where a player will be able to interact with a non-playable character and receive a response in the form of dialogue. Additionally, more research to be made on the traversing from one location to another. (Christina Kong)

D. Time log

Total Number of Hours worked on the project this week per team member.

Kong: (3 hrs), **Swift:** (2 hrs), **Whipp:** (5.75 hrs)

Total Weekly Team effort: 10.75 hours

WEEK OF FEB 28 - MAR 7

A. Weekly Accomplishments

Describe what task was completed and by whom. Complete sentences, paragraphs, and explanations are required. In parenthesis, provide the number of hours the team member worked on the specific task.

- 43) Disclaimer: This task has not been fully completed. Integrating the original environment tests with the backend. This task included creating a flask route to the page where a canvas existed which allowed the user to move a character around a small area. Once completed, a user would be able to click the play button on the home page, be redirected, and then be able to maneuver a character around the screen. The route has been created and functions and once routed to the new page the canvas can be seen. However, there were complications with even getting the canvas to display in the first place as well as getting any image assets to display on it. Problems associated are described within the next section. (Jaken Whipp, 2 hours)
- 44) Disclaimer: This task has not been fully completed. Verifying that the JavaScript and HTML front end could receive information from the database and properly showcase it within the canvas. There were issues faced with this task. (Jaken Whipp, 45 minutes or .75 hours)
- 45) Finish creating the three environments within the game. This includes the location for the teacher's office, the school hallway, and classroom. This task was conducted by using the program Tiled, which allows the user to create maps for the games. Each background map for the locations were created by using free-to-use assets. Assets are any objects or tiles, like floor tiles/wallpaper and furniture to populate the environment. These locations are where the player will be able to navigate through the game. More locations will be added in the future. (Christina Kong, 2 hours)
- 46) Was able to integrate object interaction into the capabilities of the player. This involves using a specific action next to a specified area of the environment and having an interaction occur. The end result of this is a dialogue system but that has not been completely integrated yet. (Grayson Swift, 3 hours)

B. Problems/Issues

Describe the problem/issue, who is working on it, what the cause is, what has been tried to solve it, expected resolution. Complete sentences, paragraphs, and explanations are required. Explain how it may affect the project schedule.

- 21) The first main issue faced by integrating the initial environment tests with the backend was centered around how flask references items. Similar to a problem faced with images within the last group project, the webpage was not recognizing where the JavaScript file being used within the HTML was stored. After a significant amount of time, I recognized the issue's similarity to last semester's and was able to solve it with the same approach. (Jaken Whipp)
- 22) The next issue with integrating the initial environment tests was flask's referencing of image assets. Within the JavaScript code, several images are referenced for the background or for character sprites. However, I experienced an incredible amount of difficulty trying to get these images to properly display within the canvas. I have tried explicitly stating they are in the static directory within the source statement, simply using just the file's name, giving the exact file path to their location on my computer, and using the roundabout way flask requires for images. However, all of these have not produced the expected result. Despite this, I am certain that the issue is with the defined path because testing it with relative file paths not through flask allows the images to display correctly. Additionally, trying to console log the image source within JavaScript was not working, which made troubleshooting what the program is expecting as

the file path incredibly difficult. This issue will affect the remaining project schedule as the assets are absolutely necessary when it comes to displaying the environment of the game. (Jaken Whipp)

- 23) When it comes to testing the functionality of canvas with the database, there were several problems associated with it. Firstly, there exists an issue with passing the information from the database to the HTML template which runs the JavaScript code. Passing the data to the HTML page is fine, however making it so the JavaScript code could utilize it became troublesome. In order to try to make the data given from the backend to the frontend, I tried using a meta HTML tag on the data given from flask and then a statement within JavaScript which should have allowed it to access the data (according to comments I was reading which had a similar issue). However, there was an error associated with this that I have yet to fully work out. I also intended to try changing the formatting of the data passed from the flask backend to a JSON format which is common for JavaScript. Moreover, the console log issue, explained in the previous item, persisted here. Being unable to console log the data within the JavaScript makes it much harder to see what the JavaScript is receiving, or if it is receiving anything. These problems will affect the project schedule because without this functionality, the game itself would not be able to run unless all the information regarding questions, and other associated parts, was explicitly hard coded in. (Jaken Whipp)
- 24) There was difficulty with using the program Titled to create the maps for the game. Issues with layering of objects, and properly setting up the base layer. After watching tutorials, and experimenting with the controls/options of the program, these issues were quick to solve. (Christina Kong)
- 25) Ensuring that the area where the player can be when the interaction occurred required an amount of fine tuning to exclude any unwanted interactions in unintended areas. (Grayson Swift)

C. Next week's planned work

What do you plan to work on next week? Complete sentences, paragraphs, and explanations are required. If you have pending issues from section B, how will they affect next week's plan?

- 21) For next week we plan to integrate player-npc interaction into the game. This entails receiving a response from a non-playable character by interacting with them.
- 22) For next week, I will be going back and continuing to troubleshoot the problems experienced in section B for the work which was being done this week (Jaken Whipp).

D. Time log

Total Number of Hours worked on the project this week per team member.

Kong: (2 hrs), **Swift:** (3 hrs), **Whipp:** (2.75 hrs)

Total Weekly Team effort: 7.75 hours

WEEK OF FEB 21 - FEB 28

A. Weekly Accomplishments

Describe what task was completed and by whom. Complete sentences, paragraphs, and explanations are required. In parenthesis, provide the number of hours the team member worked on the specific task.

- 1) CRUD, in reality just create, functionality has been implemented through the front-end so that users can create accounts. When the user has input information, and the two password fields match, their account will be created (unless there is already an account with the same name) and will be added to the database. If the password fields did not match, or the account was already in the database, then the account will not be created and they will be redirected to a page telling them the account registration was unsuccessful. (Jaken Whipp, 2 hours)
- 2) The environment for creating pixel art backgrounds was set up. The applications that were used to complete this task were Procreate and Tiled. Prepared assets to be used for making the background. Assets are objects like the teacher's desk, tiles for the floor where the player will be able to walk on, lockers, etc. (Christina Kong, 2 hours)
- 3) Object interaction within the environment of the game had its framework created and work began on properly introducing collision where it is supposed to be in the environment. I also started a basis for a dialog system that needs further work. (Grayson Swift, 3 hours)

B. Problems/Issues

Describe the problem/issue, who is working on it, what the cause is, what has been tried to solve it, expected resolution. Complete sentences, paragraphs, and explanations are required. Explain how it may affect the project schedule.

- 1) There was difficulty in transferring assets from the program Procreate to Tiled, though this problem was quick to solve. (Christina Kong)
- 2) Not having all of the assets readily available makes some preparation difficult and creating context sensitive interaction caused problems within the control code. Not impossible to work around but attempting to make a dynamic system is preferable to hard coding everything. (Grayson Swift)
- 3) There were some difficulties surrounding checking the account already in the database to make sure that two accounts were not created with the same name, however this was not a difficult issue to solve it just made the task take a bit longer than I had anticipated. (Jaken Whipp)

C. Next week's planned work

What do you plan to work on next week? Complete sentences, paragraphs, and explanations are required. If you have pending issues from section B, how will they affect next week's plan?

- 1) Continue working on and finish building the environment for the game. This includes the background for the teacher's office, hallway, and classroom. Sketches will be used as a guide to draw out the backgrounds. (Christina Kong)
- 2) Finalize the script for Day 1. This includes the dialogue between the player and the student (NPC, non-player character), and the Computer Science lesson. (Christina Kong, with help from Jaken Whipp and Grayson Swift)
- 3) Create a means for the dialogue system to transition into the puzzle aspect of the game. Also creating transitions between game areas. (Grayson Swift)

- 4) Begin integrating Grayson's initial environment test so that the routes will direct to the correct page and to ensure the user's experience with the canvas is what we anticipated (Jaken Whipp).
- 5) Testing the passing of data from the backend to the canvas on the front-end and vice versa (Jaken Whipp).
- 6) Create a table within the database which stores the puzzles (Jaken Whipp).
- 7) If time, begin working on the puzzle functionality on the front end, this requires #5 and #6 to be worked out as the puzzles are stored inside the database (Jaken Whipp).

D. Time log

Total Number of Hours worked on the project this week per team member.

Kong: (2 hrs), **Swift:** (3 hrs), **Whipp:** (2 hrs)

Total Weekly Team effort: 7 hours

WEEK OF FEB 14- FEB 21

A. Weekly Accomplishments

Describe what task was completed and by whom. Complete sentences, paragraphs, and explanations are required. In parenthesis, provide the number of hours the team member worked on the specific task.

- 1) Several functions for the puzzle aspect of the game were completed this week. Firstly, two functions to dynamically create the labels for the game based on the positions of correct spots within the puzzle. The functions work for all tested conditions and do not leave trailing spaces. Another function for the puzzle was completed which checks whether a position within the puzzle, represented by an adjacency matrix, is a correct spot or an incorrect spot. All puzzle functions were completed by Jaken Whipp. The time taken to complete the label functions was 1 hour. The time taken to complete the function which checked for the correct position was 10 minutes.**
- 2) The dialogue between the characters for day one is completed. This entails the beginning cutscene for the game and dialogue between the protagonist and the student. This task was completed by Christina Kong. The time taken to complete this task was 30 minutes.**
- 3) The mock pages for the website where the game will be held are completed. The index page is completed, the registration and login pages are completed, as well as the page where the game will be displayed is completed. There are also pages to show the user if registration was a success or not. If the user inputs a wrong password when logging in they will be prompted and be able to try again with logging in. These tasks were completed by Christina Kong. All tasks took one hour to complete.**
- 4) A mock layout of the game's map has been completed. This showcases where the locations will be, pathways, and how our protagonist will navigate through the environment. This task was completed by Christina Kong and took 40 minutes.**
- 5) Flask routes were created so that a user could navigate through the main page, login, and register pages. This task was implemented by Jaken Whipp. Implementation and testing that the routes directed users to the correct page took 10 minutes.**
- 6) Within the database to be used for the application, two tables were created to store information prevalent to the game. The first table stored usernames and passwords for the players of the game. The second table stored information about computer science questions which included the question, four multiple choice options, and the corresponding answer. This task was completed by Jaken Whipp and it took a time of 20 minutes.**
- 7) A canvas front-end page was created which displayed a placeholder sprite and demonstrated that a user can use the page to navigate around a set environment/background. This functions as the main way a user would play the game as they control the placeholder sprite which will eventually be replaced by our main character. This task was completed by Grayson Swift. The amount of time taken to complete this task was 1 hour.**

B. Problems/Issues

Describe the problem/issue, who is working on it, what the cause is, what has been tried to solve it, expected resolution. Complete sentences, paragraphs, and explanations are required. Explain how it may affect the project schedule.

- 1) The only problem that we have currently faced is installing/using Flask on one of the laptops. Jaken Whipp is currently working on this issue. He believes the cause to be the way in which Python is currently installed on the machine. Currently, he has tried to install Flask using pip and installing it through Anaconda. The next step he plans to take is to remove Python, cleanly install it on the system, and then try downloading Flask again. If this does not work, he will look into and use a container.**

C. Next week's planned work

What do you plan to work on next week? Complete sentences, paragraphs, and explanations are required. If you have pending issues from section B, how will they affect next week's plan?

1) Add functionality to the mock pages so that a user can create account details which will be stored on the database. Add functionality to mock pages to test whether users within the database can log in. Create a table to store game data for the user and create a test page which will make sure data for a specific user can be stored within the database. If the issue within section B is not resolved, these plans will not be able to be completed on one of the machines; however, another machine with Flask working can be brought into the classroom. Additionally, research regarding how to pass information from a database/backend to a Javascript Canvas will be investigated.

These tasks will be completed by Jaken Whipp.

2) Draw the backgrounds for the primary locations; Teacher's Office, Hallway A, and Classroom 1A. This entails any objects in a location, entryways, and other details about the environment. The art style for the backgrounds will be pixel art, and for the time being these will be rough sketches and not the final product. These tasks will be conducted by Christina Kong. There are no issues from section B that will affect these particular tasks.

3) Draw the portrait art for the protagonist and student. These will be displayed on the dialogue box, near the text of dialogue. These tasks will be conducted by Christina Kong. There are no issues from section B that will affect these particular tasks.

4) Write the script for the Computer Science lesson for Day 1. This task will be completed by Christina Kong, Jaken Whipp, and Grayson Swift. There are no issues from section B that will affect this task.

5) Based on drawings, the mapping of collisions for the game environment will be done. This task will be completed by Grayson Swift. There are no issues from section B which will affect this specific task.

D. Time log

Total Number of Hours worked on the project this week per team member.

Kong: (2 hrs), **Swift:** (1 hrs), **Whipp:** (~2 hrs)

Total Weekly Team effort: 6 hours