

## GNG 2101 C - Intro. to Product Development

### **Deliverable E - Design Constraints and Prototype II**

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# Design Constraints

Our team identified two non-functional design constraints that play an important role in the development of our prototypes. They are described in the following.

## **1. A visual demonstration of instructions**

The client has expressed a need for the application to be simple to use and easy to understand. They also expressed that a visual demonstration of instructions would be very helpful as many users have little to no experience using a mouse on top of having visual difficulties. Our application can fully function without a visual demonstration of instructions, however, for the purpose of a good user experience for any user whether they have advanced or no mouse skills, our team decided to categorise it as a constraint. This decision was driven by the fact that some users won't even know what to do once the application is launched which is why a visual demonstration of instruction is of a high priority.

This constraint was identified from the beginning and therefore was already accounted for during the design stage. However, some changes described below are deemed to be necessary based on the feedback received after testing our first prototype.

Each level of the game will come with its own set of visual instructions as the game difficulty increases with each level and more functions are added each time. Our team has to make tutorial videos with captions for each set of functions that will be used in each level to make the application simple to understand for the users. Our team decided to make multiple tutorials instead of one exhaustive tutorial video so as not to overwhelm the user and help them learn step by step. The previous exercise that we had in our first prototype is replaced by a practice exercise that will be added after each tutorial. The exercises are mainly involving working with folders. Namely, dragging, opening, duplicating a folder and scrolling over its content. Some instructions and symbols will be replaced by words to make it easier for the user to navigate through the different modules.

## **2. Not childish : age appropriate**

The client has expressed a need for the content to be age appropriate since this was the main concern of the potential users. All similar products that were tested were 'too childish' in their perspectives. Changes would need to be made in certain aspects such as difficulty level and aesthetics to meet the client's needs. It is a non-functional design constraint as it doesn't change how the application works. However, it was explicitly brought up by the client on multiple occasions which was enough to make it a constraint.

This constraint was identified from the beginning and therefore was already accounted for during the design stage. However, some changes described below are deemed to be necessary based on the feedback received after testing our first prototype.

Our team picked a theme for each level. For the first, second, third and fourth levels, the theme was ocean, farm, forest and universe respectively. The pictures chosen for the puzzle were real images of the different themes. Furthermore, each puzzle is made of 4 different pictures of the same theme which can all be described using only one word. This increases the difficulty compared to having one picture only. Once the puzzle is done, the user also has to guess the word that the puzzle refers to which makes our application even more age appropriate as it involves some thinking as well. Some changes were also made to disable the ability of the puzzle pieces and the words to hide behind other entities of the game. The snapping feature was also removed. The user can drag the letter wherever and decide to drop it where they think it's right. If it's wrong then the frame will turn red, otherwise it will turn blue and the user has the ability to drag it again wherever. The user can't move on to the next level until all the frames turn blue.

To test our prototype 2, a survey was made to collect the feedback obtained from the users. This method was used for testing the first prototype and was very helpful in coming up with the changes for the second prototype. Therefore, our team decided to use the same testing method. The prototype 2 was tested after the changes above have been made and the feedback demonstrates the effectiveness of the changes in satisfying the constraints (See Table 1)

# Prototype II Development

## Client feedback

Our team showed the client a demonstration of the new prototype. The client was very pleased with how it turned out. They didn't really give us any feedback. However, they answered some of the questions we had about the new changes we made, especially on the module and puzzle parts of the prototype.

## Testing Feedback (Prototype I)

### Module

- For the exercise, any mouse-clicking motion is accepted and seen as successful despite being a left-click exercise .
- The letters can go behind each other in-game and hide each other in the click+ drag exercise.
- Slow response time for king exercise, doesn't really go where you wanna go.
- Instructions and exercises are hard to understand.

### Puzzle

- Overlapping pieces in a puzzle can be stacked on top of each other and be hidden.

### Word

- The letters have the ability to be hidden behind the picture.
- The snapping feature prevents the user from making an error; Automatically snapping even if you are not very close to the letterbox.

### General

- Characters can get lost in the far right and far left of the screen.
- Tend to focus on understanding what is being asked instead of practicing mouse skills.
- Pictures too Childish.

## Updated Detailed Design

Taking into consideration the feedback we received above, we have slightly altered our detailed design to fit better success when testing our critical assumptions. First off, there will be four pictures for each level instead of progressively increasing the number of pictures at each level. This is to help them determine what the word is since there will be more than one

representation of it. Furthermore, we have decided to have a theme of *nature* for all levels of the game.

As for the module, we decided to remove the variety of complicated exercises and create one simple encompassing exercise per module. The updated detailed design is shown below.

## Level 1

- Word : Ocean
- Module Exercise : The user will need to select a file, drag it and then drop it into a bin.
- Puzzle : 8 pieces
- Required actions : Left click, Drag, Drop





## Level 2

- Word : Farm
- Module Exercise : Drag and drop files into a folder and open it to see the contents
- Puzzle : 8 pieces
- Required actions : Left click, Drag, Drop, Double click



### Level 3

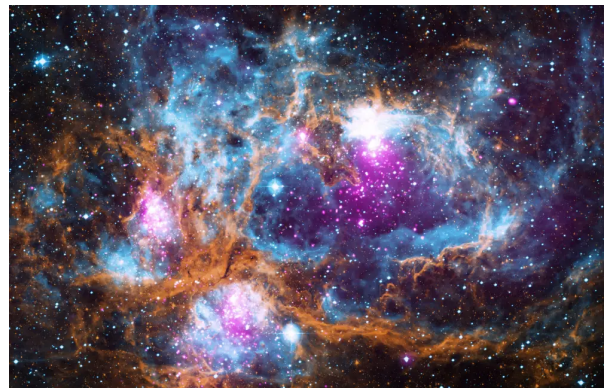
- Word : Forest
- Module Exercice : Scroll to see the different contents of a folder
- Puzzle : 12 pieces
- Required actions : Left click, Drag, Drop, Double click, Scrolling





## Level 4

- Word : Universe
- Module Exercice : Copy and paste one or more files from one folder to another
- Puzzle : 20 pieces
- Required actions : Left click, Right click, Drag, Drop, Double click





## **Settings**

The settings have not been implemented yet. They will be implemented in our last prototype along with all the remaining levels for each part of the game and modules. They include Brightness Options and mouse sensitivity to accommodate the users.

## **Modules**

The modules are divided into 4 different sections, each corresponding to one level. The goal was to let the user learn the different mouse functions step by step without being overwhelmed. All the exercises will have instructions and all the tutorials will have captions to make it simpler for the user to understand what is required from them. The user also has the option to skip the module and go directly to the game if they want to. The different sections are described below.

- **First module**

This module contains a tutorial video describing the different mouse functions required for level 1. Namely, left-click, drag and drop. The video contains captions and the functions are repeated multiple times during the tutorial to make sure the user understands. Then, the user will be asked to practice the functions they just learnt. A practice exercise where the user is asked to left-click, drag and drop files into a folder will be provided and once they are done they can start the puzzle.

- **Second module**

This module also contains a tutorial video about the same mouse functions of the first module with one new mouse function. Namely, double click. A practice exercise where the user will have to drag and drop into a folder and then use the double click function to open the folder and reveal its content will be provided.

- **Third module**

This module also starts with a tutorial video about all the previous mouse functions and a new one. Namely, scrolling. Again, the user will be able to practice on a provided exercise that will ask them to drag and drop files into a folder, double click it to reveal the content and then scroll to see the different files it contains.

- **Fourth module**

The last module starts with a tutorial video about all the previous mouse functions and a new one. Namely, copy and paste. The user will be able to practice on the provided exercise. They will have two folders, which they have to open using all mouse functions learnt in the previous modules, and then copy and paste one or more files from one folder to another.

## Prototype II

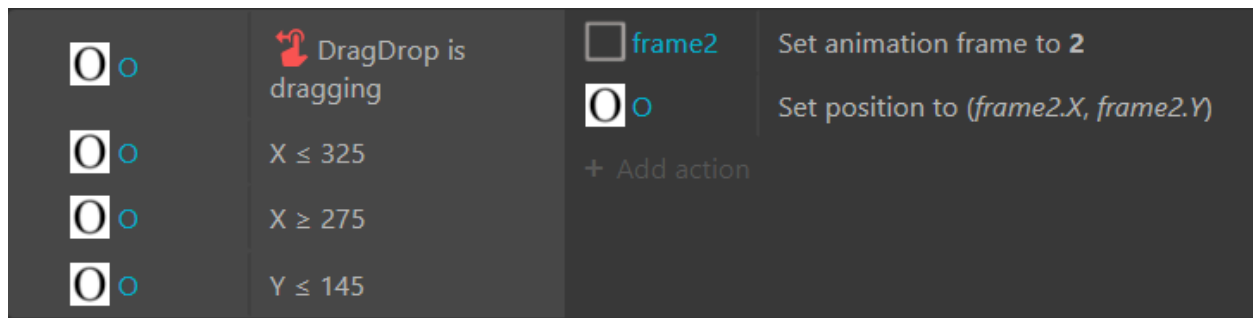
<https://hi3u.itch.io/pde>

### Goals

- Create Module Videos for levels 1 & 2
- Create puzzles for levels 1 & 2
- Create the word part for levels 1 & 2 & 3 & 4
- Descriptive settings UI model
- Debugging

## Game - Word

To fix the problem with some boxes turning red before the letter was near the frame, we added precise measurements for the “wrong” margins for each possible combination.



Level 1:

Drag the letters in the correct order to form the word representing the image.



E N  
O  
C A

### Level 2:

Drag the letters in the correct order to form the word representing the image.



M A  
R F

### Level 3:

Drag the letters in the correct order to form the word representing the image.



T F E  
O S R

### Level 4:

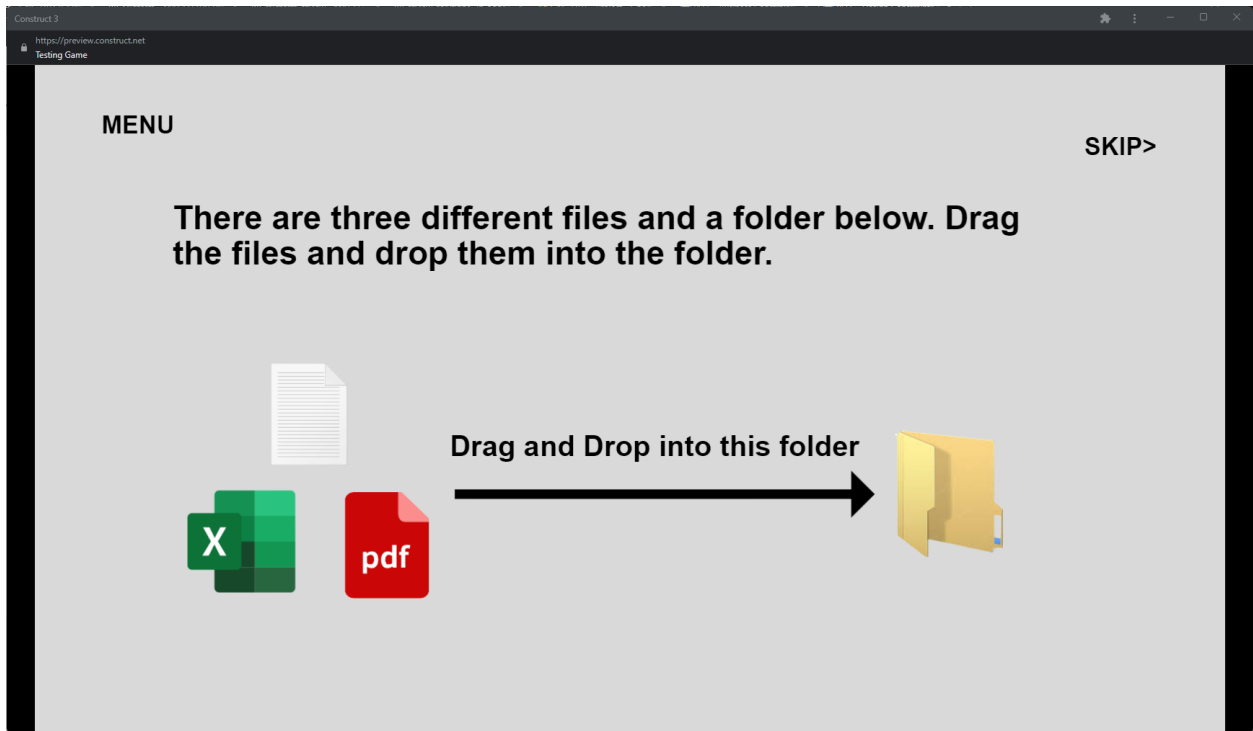


I V N  
U  
E R  
S

## Game - Module

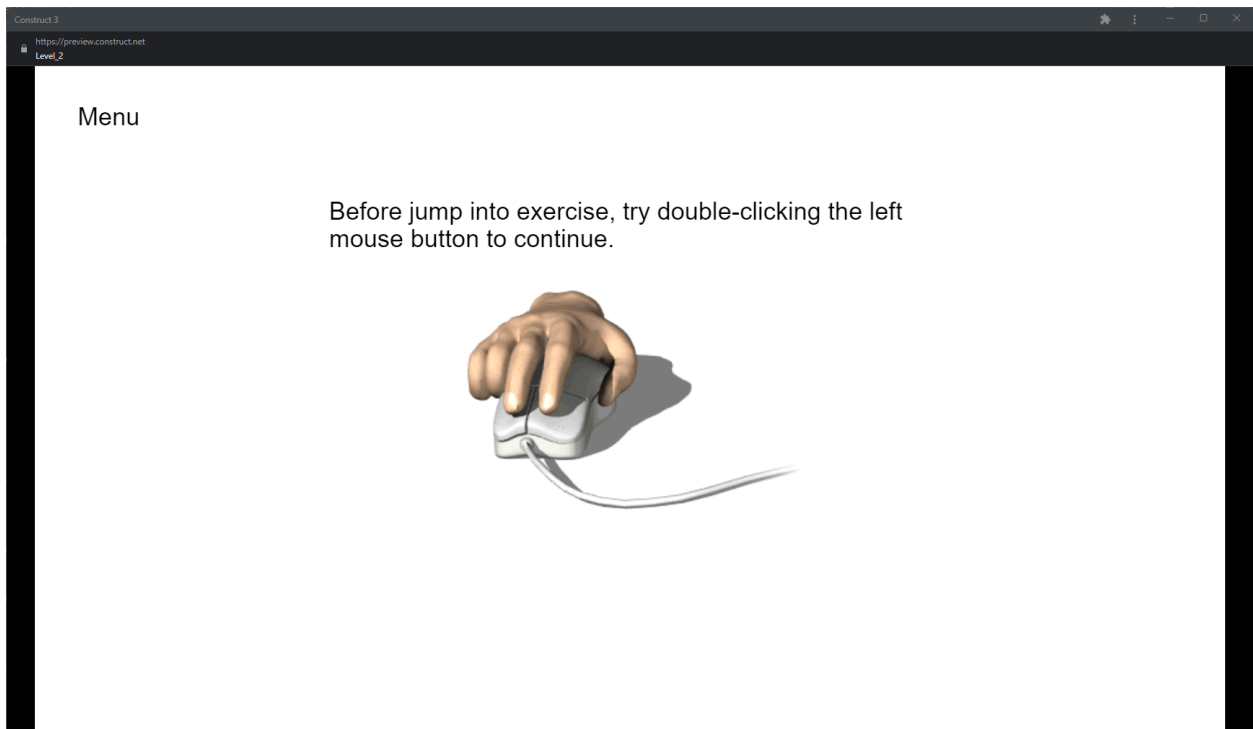
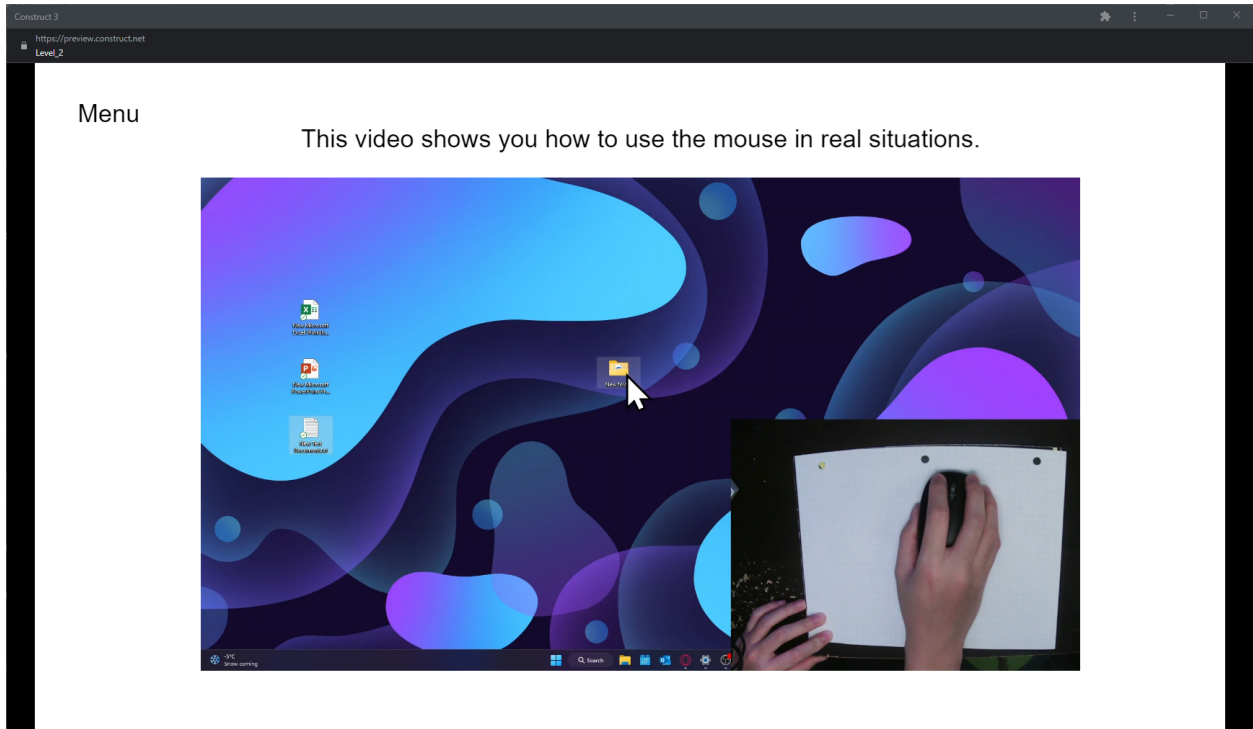
### Level 1:

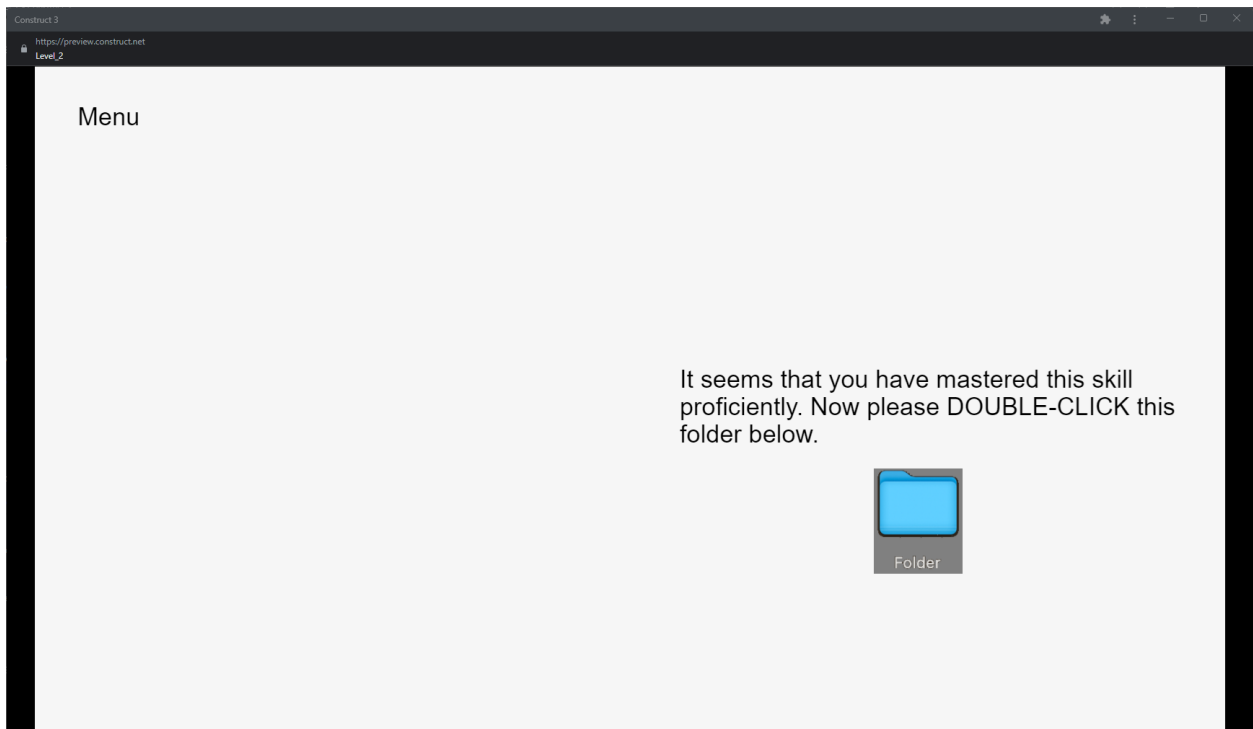
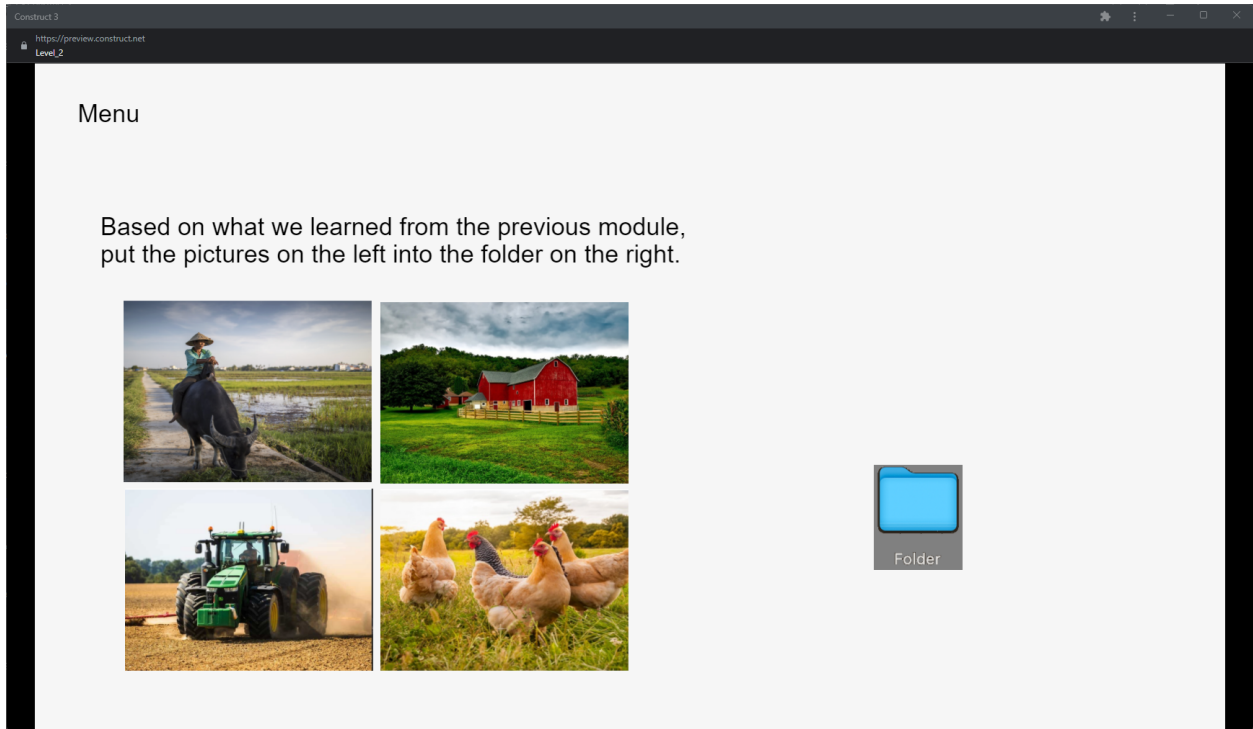


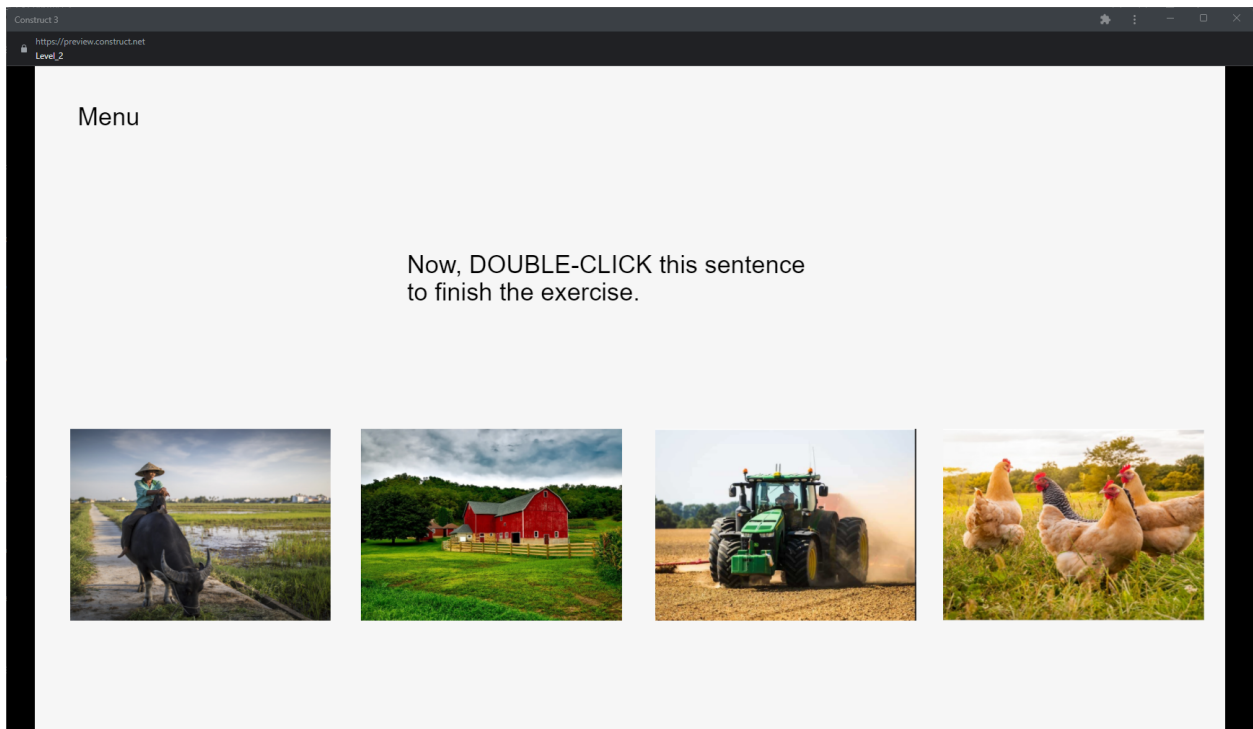
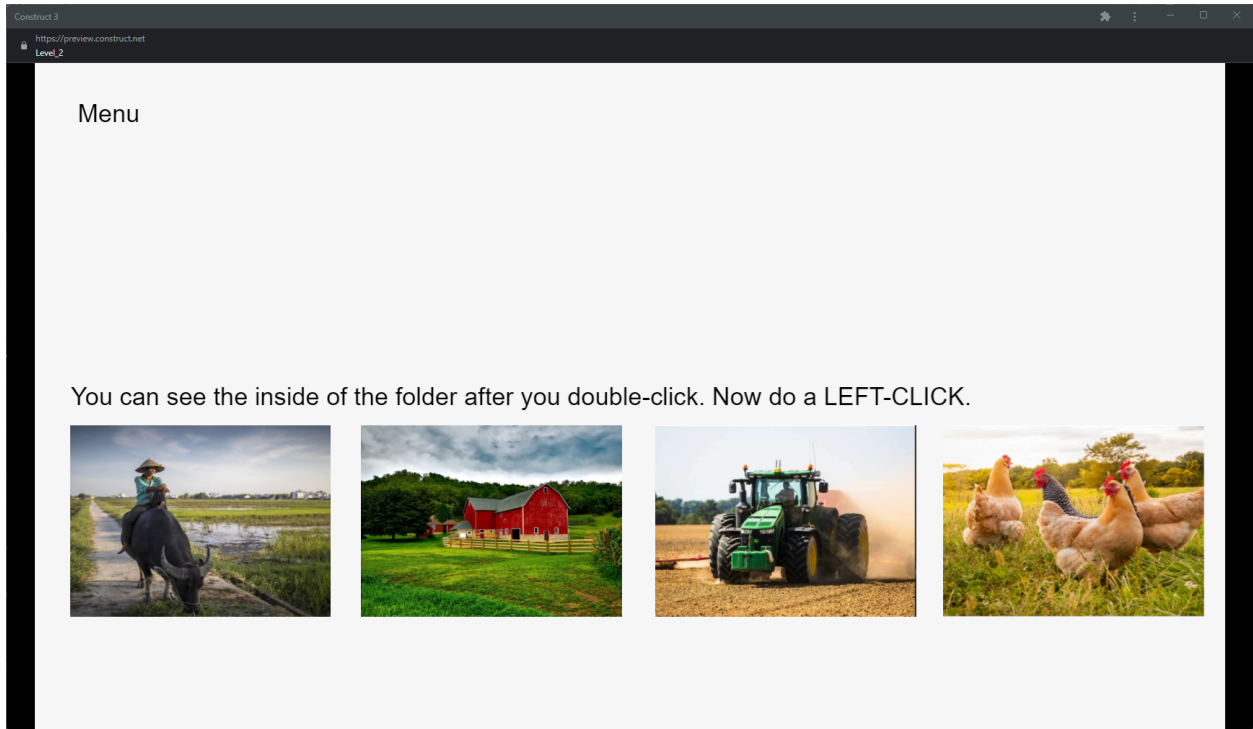


## Level 2:









## Game - Puzzle



# Prototype II Testing

**Table 1 : Prototype II testing results**

Test #	Objective	Test Method Description	Test method	Expected Result	Actual result
1	Age Appropriate	Ask people about user experience and how easy the app is to use	<a href="#">Customer survey</a>	<b>100% → Yes</b>	60% → YES 40% → NO
2	Teach fundamental mouse skills ( left click, right click, dragging)			<b>100% → YES</b>	100% → YES
3	Improvement of the prototype			Scale 1 → 4  1 - horrible this version is worst 2 - This version was the same 3 - This was a little better than the previous, 4 - This version is almost perfect	80% → 3 20% → 4

Module					
4	Has a visual demonstration of instructions	Ask people about user experience and how easy the app is to use	<a href="#">Customer survey</a>	yes/no Binary  <b>Yes</b>	Yes →100%
5	Instruction easy to understand			Scale : Strongly agree Agree Neutral Disagree Strongly disagree  <b>100% → Strongly agree</b>	40% → Strongly Agree 60% → Agree
6	Intuitiveness of exercices				80% → Agree 20% → Neutral
Game: Puzzle					
7	Instructions easy to understand	Ask people about user experience and how easy the app is to use	<a href="#">Customer survey</a>	Scale : Strongly agree Agree Neutral Disagree Strongly disagree  <b>100% → Strongly agree</b>	20% → Strongly Agree 80% → Agree
8	Puzzle connection			Yes/no Binary  <b>Yes</b>	80% → Yes 20% → No
Game: Word					
9	Instructions easy to understand	Ask people about user experience and how easy the app is to use	<a href="#">Customer survey</a>	Scale : Strongly agree Agree Neutral Disagree Strongly disagree  <b>100% → Strongly agree</b>	80% → Agree 20% → Neutral

10	Lagging and logical errors	Each Module is testing for edge cases, logical errors and lagging. All functions	Team runthrough	Some logical errors to be detected and debugged  YES	For the exercise, a correct letter can be put on top of incorrect letter and when the correct letter is remove it's shown as correct  Module level 2, double click here difficult to understand  Puzzle piece can be hidden from each other and some pieces don't connect properly  YES
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## Conclusion

The second prototype that our team developed meets the target specifications and satisfies the different constraints. Some changes will be made to give the user a better experience using our application based on the feedback. Our team will work on the final prototype keeping in mind all the changes that need to be made and all the improvements based on our second prototype. The feedback we received is very promising and our team thrives to get higher scores. The final prototype will be comprehensive with a high fidelity as all the levels, settings and modules will be implemented.

# Project Plan

Wrike Snapshot Link :

<https://www.wrike.com/frontend/ganttchart/index.html?snapshotId=X888tp4hRvJt9oE0Uk5z6iafYRtRLZn7%7CIE2DSNZVHA2DELSTGIYA>