Memory Game Project
for UTM CSCI 352

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Abstract

This project is a Memory Game that keeps score of how many matches the player got. The target for this game is really anyone that likes memory games or that likes to test their memory, it might even be used to study with. We have come up with the general idea of what its going to look like.

1. Introduction

With this project, we are going to try to make a fun but simple memory game and by the end have something that could maybe be turned into an app later on. If people play this game, we hope they just have fun and not compare it to one of those bad ad infested games on the app store. This is a first step into maybe creating games for a living or just to get a better understanding on how 2D video games are made.

1.1. Background

We decided to do this type of project because we play video games all the time and want to make our own and learn how complex or easy it is. We chose a memory game because puzzle games are more like disguised mental challenges that keep your brain alert and your memory active.

1.2. Impacts

The only impact that this project would really have is on health. Computer Eye Strain is a real and sometimes bad thing when looking at a computer screen for long periods of time. We highly recommend if you feel your eyes getting tired or worse start getting blurry even when you look away from the screen, take a break from your work, game, or whatever you are doing. Don't ruin your eye sight just for a silly game.

1.3. Challenges

The main challenges in our opinion will probably be getting all the interfaces to work together and interact with one another. More challenges would have to be animating the rotation of the pictures and randomly shuffling the pictures around when the game starts. We can't really think of any solutions right now for the main challenges, but we are thinking about fading in the pictures instead of animating the rotation. A fade in/out sounds easier to implement.

2. Scope

The goals for this project are as follows, keep up a good pace so we don't fall behind on coding it, have a working game that plays good and doesn't feel hacked together, have everything working 2 weeks before due date to go over bugs or problems, be happy with what we made and how it all came together

Stretch goals:

- taking away the matched pictures from the board
- the user can turn off the background music, and to have background music

We feel the project will be done when we are happy with how it all looks and plays, as well as being able to play an entire game and have no major hiccups (in a perfect world we would want it to have no hiccups at all, but this is a project for a semester of class and there is limited time to work every bug out). As long as we feel like it plays well and seems fun to play, it will be done. As far as time goes, we would like to have at least two weeks before the project is due to go over bugs and problems with code.

2.1. Requirements

These will not be all the requirements by the time the project is done, but these are some of the core requirements that we will have in the project. Seeing as this project is a game, there are going to be minimal functional and non-functional requirements.

Use Case ID	Use Case Name	Primary Actor	Complexity	Priority
1	Normal difficulty is selected	Player	Med	1
2	Pause	Player	Med	1
3	Restart	Player	Med	1

TABLE 1. MEMORY GAME USE CASE TABLE

2.1.1. Functional.

- Game lets user click on all pictures
- Game has ability to let the user restart from any point in the game
- Game has 3 levels of difficulty
- Game lets user turn off background music if wanted

2.1.2. Non-Functional.

- Game has nice menu layouts and backgrounds
- Game should load within a second
- Each screen transition should be smooth

2.2. Use Cases

These use cases are brief examples of how our game is expected to run and be used.

Use Case Number: 1
Use Case Name: Normal difficulty is selected
Description: A player in our game has selected normal difficulty. They will click on the "Normal" button. This will start the process of loading up the normal game screen.

1) Player starts game.
2) Player left-clicks on the "Normal" button.
3) The normal game screen is loaded up, and the pictures are shown for a set amount of time so the user can memorize them.
4) The player can now play the normal difficult game.

Use Case Number: 2
Use Case Name: Pause
Description: A player in our game has paused the game. They will click the "Pause" Button. This will stop the timer and show a pause menu.

1) Player is playing game.
2) Player clicks the "Pause" button.
3) The timer stops, and the background is faded to show the pause menu.
4) The player can either resume playing the game, restart the game, turn on/off music, or quit the game.

Use Case Number: 3
Use Case Name: Restart
Description: A player in our game has decided to restart their game mode. They will click on the "Restart" button in pause menu. This will restart the game mode, erasing the previous game.

1) Player hits restart from pause menu.
2) The game mode will be restarted.
3) The timer and score will be reset back to 0 and the pictures will all be randomized again and be shown to the player again.

2.3. Interface Mockups

These pictures are screenshots of the windows of the game.

Figure 1. The main screen layouts for our memory game

3. Project Timeline

Project Proposal, 09/09/2020 - This Document was created and we decided on what type of project to do, gave a brief introduction, an abstract of the project, and some impacts and challenges that the project would have.

Project Update 1, 09/29/2020 - We made the requirements for the project and started thinking about the functional and non functional aspects of the project. We made 3 use cases for how the project would function, and mocked up some interface ideas and layout.

Project Presentation, 10/06/2020 - Showed off the interface mockups to Dr. Guerin and got some feedback and some ideas of where the game could go.

Project Update 2, 10/30/2020 - Made a timeline of the entire project and made future deadlines to hopefully fulfill.

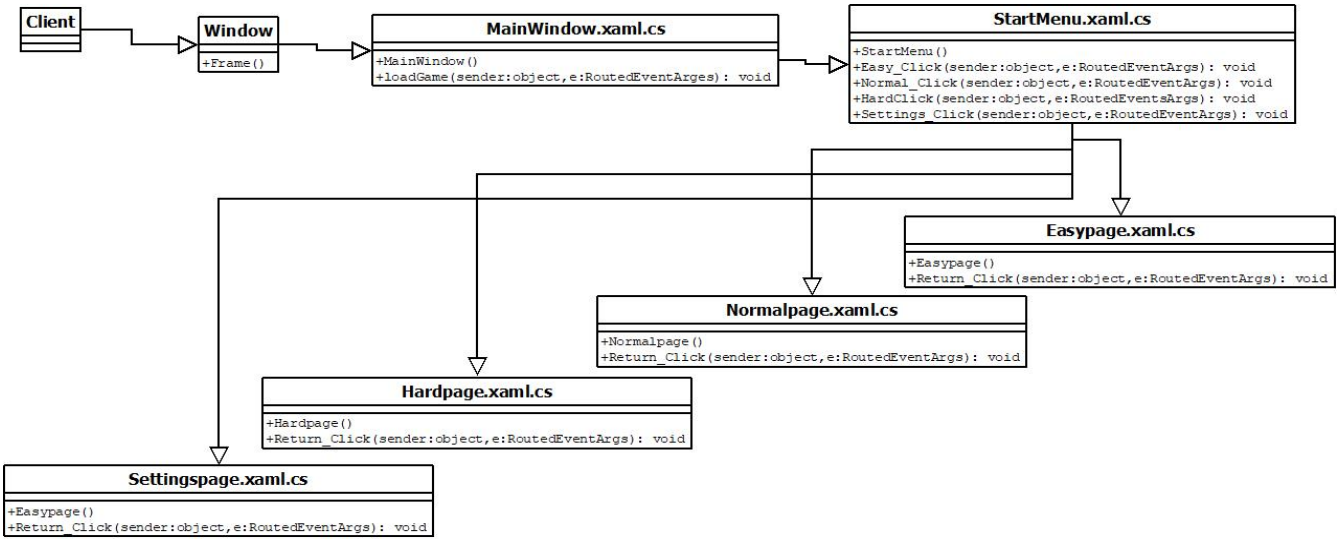
All pages and elements are done, 11/01/2020 to 11/8/2020 - We hope to have all game elements in every page and working to an extent by the end of next week.

Project is working, possibly 11/15/2020 - We would like to have the project working and almost done by this point to give at least a week to debug and add anything else that we see needs to be added.

4. Project Structure

We chose to keep this game kinda simple, but we can always keep adding to it to make it more complex. We were going to use a hand drawn aesthetic for all the fonts in the game, but when it was imported to the program, it didn't look good, so after looking though the given fonts, we found one that closely looks like hand drawn words. The background music was chosen for a relaxing mood, and jazzy feel. The pictures are family friendly, there are no NSFW images or anything like that in this game. The pictures were chosen for each difficulty so that easy was easy, normal was a bit of a challenge and hard would be extremely complex to remember. For some of the buttons, like the music button, we wanted it to be a picture rather than a regular looking button. As the game loads, the transitions between all the pages have a bit of a delay in them just so the game doesn't feel too fast. As of now that is pretty much everything we have thought of as far as structure and design choices.

4.1. UML Outline



4.2. Design Patterns Used

We are still determining what design patterns to use, honestly because we have struggled with the design pattern assignments and don't fully understand how to implement them into this project.

5. Results

The project as a whole is still rough, but all the pages are mostly done, we have what pictures we are going to use, and now we are just trying to figure out how to make everything work. In this last week, we will hopefully have a memory game that works.

5.1. Future Work

What will need to be done next is just to get all the pages complete and get all the background programming done and to the point where we can do some debugging. The last goal we set is half done, all the pages are there and the pictures are gotten, but how the game works is still taking some time as we figure out how everything will go together.

References

[1] H. Kopka and P. W. Daly, *A Guide to LaTeX*, 3rd ed. Harlow, England: Addison-Wesley, 1999.