Capstone: Final Report

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Introduction

For our capstone project, we decided to develop a two dimensional fighting game in python. During the development of our game, we learned the amount of work that was required to develop a game was substantial and that we were very satisfied with our choice of a project. In this report we will describe the difficulties and the process of how we made our game.

Problem Statement

Our project is a two dimensional fighting game made in python using the pygame library. It was a good fit for our capstone project because of the difficulty involved in making the game and in the general scope of the project were enough to satisfy the requirements of being a capstone project. We had to learn new libraries and a completely new language in order to complete our capstone. A capstone project cannot be short and easy and this project was neither of those two things. It would not be beneficial to a student if a project was allowed to be short and easy. Our project has the potential to be as difficult as we want to be.

Background

One of the major reasons we chose a fighting game in python as our project was because we knew we could get help online if we hit an obstacle. There are many forums of support for the pygame library and numerous tutorials for it, so if we ever got stuck because of those two things, there was help for us. Also, there have been fighting games already made using the pygame library, but nothing exactly like what we wanted to do. So there was support if we needed it, but different enough to where our project would be unique on its own.

Project Timeline

When we first started out the semester, we had agreed that we would meet up every Sunday of the semester to work on our capstone project. This rule helped us out tremendously during the semester. There was only one time during the semester where we were not able to meet up during a Sunday, and on that occasion we met up on that Saturday to work on it. So the first objective that we had to complete in our project was getting characters made. In order to do this, we had to use a sprite editor called aseprite. It took a solid two weeks to create the sprites. We had not realized how time consuming the sprite making would be when we first started making them. Both of us had never made any sprites so there was a learning curve when making them which made the process take a little longer. The next Step in the process of making the game was making the characters move in a window. We made test programs that showed the sprites gliding on the screen with no animation yet implemented. Once we got that part of the project completed, then we focused on the user interface. We made a functioning menu so that we could link it with the actual game. We also added sound during this time to the game. All of this was time consuming because this was our first exposure to python and because we were learning about how to use the pygame library at the same time. The next step in the development of the game was figuring out collision detection. We had to make sure the characters could not leave the screen and that they could walk along the surface. Animation was the next step in our development of the game. Whenever we were making the game, we had not realized that pygame does not support gif animation. So we had to animate the characters ourselves by cycling through the images when a player presses a movement button. The next thing we did during the semester for our capstone was make the sprites be able to attack each other and show the damage they had received with a health bar. Along with this, we also implemented a win screen that would display the result of the match and play victory music in the background. An instructions menu option was also included at this time that would take you to a page that showed you how to play the game.

Design and Implementation

For the design aspect of the project, at the beginning of the semester, we did not really have an idea of how we wanted to implement the project. We later settled on making it object oriented and linking it all together. As the semester went on we continued to use this approach, but we did change the classes we were going to have. For instance at the beginning of the semester we had planned on having a character class, but ended up implementing the game differently to where we did not need a character class. We may go back and rebuild the project to the original specifications later on. We did however stick with our idea of using python to implement the project. The reason we chose python was because it would be useful later on in our careers when applying for jobs and it had a very nice game development library called pygame. If we would have chosen another language to implement our game in, we may not have had the same support or help that we did for python and pygame.

For the most part, the user interface and the game logic foundation was completed this semester. We were able to get a functional menu that worked smoothly implemented and for the actual game, we were able to add attacks, movement, and animation to the characters. There are still some bugs in our code however. One such bug is that when a character is walking on a platform and he steps off of it, it does not fall as would be expected. We also did not get a chance to implement all of the platforms on the level. The characters can only get on one of the three platforms in the level. We did fix some bugs our game had however. There was a bug early on in our game where a player could jump and touch the ceiling on his first move in the game. We eventually found the bug and fixed it, but It took some weeks of searching. In the future for the second part of our capstone, we want to implement artificial intelligence. We want a user to be able to play against the computer. Another function that we would like to add to our game is a networking option. We want people to be able to play each other over some kind of network. We will be focusing on those two aspects in the second course of our capstone.

Conclusion

When we first decided to implement a fighting game in python, we had no idea what we were getting into. We were challenged and frustrated throughout the semester working on it, but the pleasure we got when completing a task made the sacrifice worth it. Learning Python along the way was a big bonus because it's ever increasing presence in industry. The game is visually pleasing so far and we plan on adding more functionality to it in the future, but for now, we are very proud of how far we have taken our project.

GitHub Link

https://github.com/dieg08/PyFighters-