

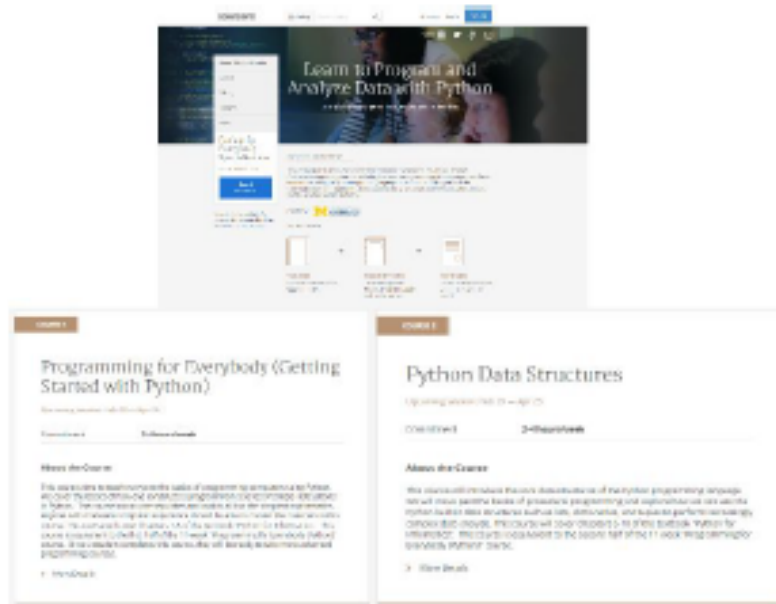
even further, I can apply methods that I know helps me focus and work effectively, because I have tested them in this project. Even if I don't plan correctly, and I get caught up with a lot of work, I have practised how to work well under pressure, as I did in appendix 1G, H, I and J. These journal entries were only 11 days apart, but I made four entries because of how effectively I was able to work, even if it was under pressure.

Appendices

1: Journal Entries

A: June 4th

Today I started with a course from coursera.org about computer programming in python¹ taught by Dr. Charles Severance ("Programming for Everybody (Getting Started with Python)"), which was recommended to me by Mr. Marius. It seems like a good way to learn, as it is structured with video lectures to teach the material, and assignments and quizzes to document my learning. It has an app along with the website, which makes it easier to follow the course wherever I am. I have decided to start my learning before school starts in order to get a head start on the personal project, which I think will help me with my time management.



¹ This course has since been extended, and parts 1 and 2 of the course currently being offered on coursera.org is equivalent to the course I took.

B: August 11th

I have completed the "Programming for Everybody (Getting Started with Python)" Coursera course that I started in June, and it has taught me the basics of python. I now know some of the different possibilities with using python are, and although I have far from mastered python, I know how to do a few simple things. An example is a program that opens a file and finds out certain information about it, such as the most commonly used word, and then presents it to the user.



C: August 20th

After speaking to my friend _____, who has some previous programming knowledge, about my personal project I have decided that I will be creating a game with python using 'pygame'. Pygame is an extension to python designed for creating games, and would allow me to focus my efforts on how to make the game, and not on the technical sides of python, such as trying to figure out how to make a screen appear or handle user inputs such as keyboard interaction. I will be following a 100 video YouTube playlist (Kinsley, "Pygame (Python Game Development) Playlist"), which might be a bit long, but allows me to get a wide and wholesome understanding of pygame.

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D: *September 12,*

Last week's meeting was useful for me to get me back on track, as I have not been actively working on my project since the formal introduction of the project, after starting with the pygame tutorial. I will attempt to work more regularly from now on, and to make it easier I have created a plan for when I should complete certain tasks. This should help me to focus on one task at a time. Today I added two previous journal entries to ManageBac to make sure that my learning had been documented, and I will aim to work on defining a goal and global context, and possibly the criteria for my product before the next meeting. I will also attempt to keep my Journal more up to date.

E: *November 20,*

I Discussed my progress so far with my supervisor, and we agreed that there is currently one bottleneck in the project that is holding me back. This is that I have not acquired all the skills I need to create a game with python and pygame, I still need to learn how to fully use pygame, and this halts my progress. I can't come up with the idea for the final game, as I do not know what opportunities I have with pygame, and my goal, criteria and global context are all reliant on this aspect. We agreed that my priority now should be completing the tutorial I am following, so that I can move on. I was also recommended to check out other sources of information for my project, and I have thought that I can contact previous students of AIS who have done their personal projects, to get an interview or similar. I thought of _____ and _____, who have done similar projects to me, and also _____, to get a different perspective as well.

F: *January 7th*

It has been some time since I last made a journal entry, and I realize that I am somewhat behind on how much work I should have done by now. I hope to pick up the pace from now on by working more regularly on my project, in order to catch up and finish on time. Currently I am still in the process of acquiring skills, which means important parts of my project, such as my final goal, have to wait until I have completed this. I do however have some idea of what kind of game I want to create and I have begun to think of ways to overcome possible challenges. I think that the type of game I will be making

is probably going to be a tower defense game, as I think it will be enough challenge, but still achievable within the limited time left.

G: January 24

Today I decided that even though I have only watched through about 80 of the hundred tutorials I had originally planned, I am done with researching for the most part, and I will not be watching any more of the videos. I have decided on my global context, scientific and technical innovation, and goal, demonstrate my personal innovation through the creation of a tower defense game. I have also started planning for the creation of my product, and I expect any more research I will be doing will only be to check how certain functions within python and pygame works, and not focused on learning new features of the programs. I chose to not watch any more of the tutorials as I think that I may have spent too much time researching already, and my time now should not be focused on that. I think the understanding I currently have of the programming language is enough for creating the game I want to make, and I don't think I will spend a lot of time planning, as I have a clear understanding of how I want to create the game. This also means that I can begin to work on my report, as I now know for sure what my product will be. I do realize how little time is left, but I have recently made changes to my working environment in order to increase my focus on school work and to lessen distractions. This has meant moving my computer and my workspace into another room entirely. So far it was worked great, with minimal distractions and a boost in productivity.

H: January 27

In the past few days I have started creating my product, by using parts of the knowledge that I learned specifically when following the video tutorials. This has made sure I have a foundation to work from, but there is still a lot of work left to do. While trying to implement some of the remaining parts into my program, I have met both solutions and problems. Some of the features worked easily when I wrote the code for them, such as the intro screen to the game, and the algorithm for creating the background. However, I have encountered a problem when trying to "spawn" enemies, and this feature didn't work as I had hoped it would. It was relieving to see that some of my functions did in fact work, but frustrating that not everything worked.

By carefully examining the code that I was using to spawn enemies, I have been able to overcome the problem, as I found out that the problem was that I used the wrong variable when updating the position of each of the enemies. This resulted in the "spawn point" changing position to the same position of an already existing enemy. When I then tried to spawn another enemy, instead of spawning at the initial spawn point it would be placed on top of the existing enemy, which is not what I intended. This required me to spend extra time on thinking through how different parts of my code worked, and seeing if the values or other variables were the ones that I intended to use. In this case solving the issue was as simple as replacing a few words, and then the function worked as I wanted it to, although finding the specific words did take some time.

I used the Pygame documentation on the official website when I encountered some smaller problems in order to verify that I used the functions correctly ("Pygame V1.9.2 Documentation").

I: January 30

At the end of this week I have implemented several new features, and I am nearing completion of my product. I have had to check the documentation of pygame ("Pygame V1.9.2 Documentation") to make sure I used some features correctly, and after checking it was easy to fix the smaller problems. The one major challenge has been how to let the user build towers in order to stop the enemies. My original idea was to have the user click where they want to place the tower, then have them confirm the placement in a menu, but because of the way I register user mouse clicks this does not work. I had to approach the problem from a new angle: Instead of clicking where on screen the user wants to place their tower, they have to press a button and then click where they want to place it. This works around the issue I had with detecting clicks, and solves the issue in a different way than how I tried to solve it at first. The user can also upgrade and sell their towers in a similar fashion. The remaining work to be done is minor, and at this point I have mostly achieved my goal.

J: February 3

Today I have finished my product, and I am satisfied with the result. By working effectively every day since January 24, I have used only about ten days in total for the 'Taking Action' stage of the personal project. Even though it may seem like the product was a quick and easy task, I would still consider it highly challenging. This is due to my extensive research and determination to finish the product before the deadline while still maintaining quality, meaning I have been able to use my time very effectively. Even though the workload was densely packed in a short amount of time, I would not consider this to have a negative effect on the quality of the product. The time I spent was used effectively and well, and I did not get bored of working with the project which allowed me to work considerable amounts of time each day. Additionally, I had a meeting with my supervisor, showing my finished product and reviewing my report for feedback.

2: Planning

A: Research Plan

No.	Deadline	Objective	Why	How will I achieve this
1	Aug	Have finished Coursera course on python	To get a basic understanding of python, so that I have a starting point for my product	By working every week in the ten week period of the course
2	11 Oct	Decided on a topic and hypothesis	To ensure that I can start researching the topic to make progress in the project	By evaluating my personal interests, and brainstorm potential ideas, and deciding which I think is the most suitable

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3	Nov	Decide on final product.	To be able to focus on research relevant to the product	By researching into different opportunities, and deciding which one suits my project the best
4	14 Dec	Hand in first draft of my personal statement	In order to get feedback on my personal statement so far.	I should work on my report regularly
5	29 Jan	Have completed all research that needs to be done	To have at least 3 weeks to focus mostly on the product	Make sure that I have decided what research to do, and regularly progress in learning the skills I need
6	9 Feb	Hand in second draft of my personal statement	In order to get more feedback on my personal statement so far, and the changes made since the first draft	Progress my report from the first draft, working with the feedback from my supervisor
7	16 Feb	Product Due	Official deadline for completion of product	Work regularly on the product once research has been completed.

B: Design Criteria

To measure the success of the product

No.	Specifications My product should...	In detail My product should...
1	Be a tower defense game	Be a game, where the objective is to stop enemies from getting to the end of a path by the means of building towers.
2	Include an introduction and game over screen	Present the user with an introduction screen that teaches them how to play, and two separate screens when the game is over or the game is won.
3	Let the user build, upgrade and sell towers	Let the user build tower in the game screen, but not on the path. Let them upgrade their built towers with money, or sell them for a refund of money.
4	Have a system in place that aligns values to 'tiles'	Have a system that ensures that the positions of towers, enemies, etcetera are aligned to 'tiles' with a chosen interval.

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5	Display important values to the user	Have a means of communicating to the user how health they have left, how much money they have and what round they are currently on.
6	Let the user spawn rounds of enemies	Let the user decide when they want another round of enemies to spawn, by clicking on a button or in a similar way.
7	Detect if enemies reach the end of the path	Be able to detect if enemies reach the end of the path, and then deduct an amount of health from the user according to the amount of enemies.
8	Let the user exit the game at any time	Let the user have a way of exiting the game at any point; in the introduction, the game itself and in the game over screen.
9	Detect if the game is lost	Be able to detect if the user has no more health left, and end the game, switching to the game over screen when another enemy reaches the end of the path.
10	Detect if the game is won	Be able to detect that there are no more rounds left, and switch to a "game over" screen, telling the user they have won.
11	Achieve my initial goal	Demonstrate my personal technical innovation within python and pygame, through the creation of a tower defense game.
12	Show the range of towers	Display the range of built towers to the user when they hover their mouse over them.
13	Show the remaining health of enemies	Have a means of showing the remaining health of all enemies independently to the user.
14	Let the user pause the game	Let the user pause the game while they are playing it, stopping all actions except exiting the game or resuming it again.

3: Evaluation

A: Personal evaluation against criteria

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No.	Specification My product should...	Evaluation The specification is...
1	Be a tower defense game	Partly achieved, as it is a game where the user can place down towers to stop enemies from reaching the end of the path, but it lacks other elements commonly found in tower defense games, such as different types of towers and enemies.
2	Include an introduction and game over screen	Fully achieved, the game has four separate screens, that presents the game to the user, teaches them how to play the game and how to win, and two separate screens for a game over scenario and a game win scenario.
3	Let the user build, upgrade and sell towers	Mostly achieved, the game lets the user build, upgrade and sell towers, but the user is limited in some sense by having to click a button, and then click where they want to build, upgrade or sell. This limits the user, as they have to move their mouse pointer a lot if they want to interact with several towers at once.
4	Have a system in place that aligns values to 'tiles'	Fully achieved, the game has two functions that can round any value to the middle of a 30 by 30 pixel 'tile'.
5	Display important values left to the user	Fully achieved, the game displays health left, money and the current round at the top of the screen, where it is easily seen by the user.
6	Let the user spawn rounds of enemies	Mostly achieved, the game lets the user spawn new rounds of enemies when they finish the previous one, but does not allow them to spawn multiple waves at once.
7	Detect if enemies reach the end of the path	Fully achieved, whenever an enemy reaches the end of the path, one health point is deducted.
8	Let the user exit the game at any time	Fully achieved, the user can at any time click the "close window" button in the top right to exit, or in the pause menu exit with a separate button.
9	Detect if the game is lost	Fully achieved, the game detects when the user has run out of lives and switches to a game over screen.
10	Detect if the game is won	Fully achieved, when the final round is completed, the game switches to the game win screen, telling them they have won the game.
11	Achieve my initial goal	Mostly achieved, my product is of the tower defense genre and includes several different features. This demonstrates that I have learned how to make a game that performs such tasks, thus demonstrating what I have learned. Some of the features however, are not necessarily apparent to the user, and can therefore be

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		harder to demonstrate. Although this may limit how much my innovation is demonstrated, I still consider the product capable of demonstrating most of my innovation. This is because my goal was to do this through the creation of a tower defense game, which is what my product is.
12	Show the range of towers	Fully achieved, the range of towers is displayed when the user hovers their mouse over any tower, and additionally shows the increased range of an upgraded tower before the user upgrades it, and the range of a new tower before the user chooses to build it.
13	Show the remaining health of enemies	Fully achieved, the remaining health of every enemy is displayed directly above them in the form of a line proportional to the amount of remaining health.
14	Let the user pause the game	Fully achieved, the user can press a pause button to bring up a menu and stop all actions. They can choose to resume or quit the game.

B: Peer evaluation

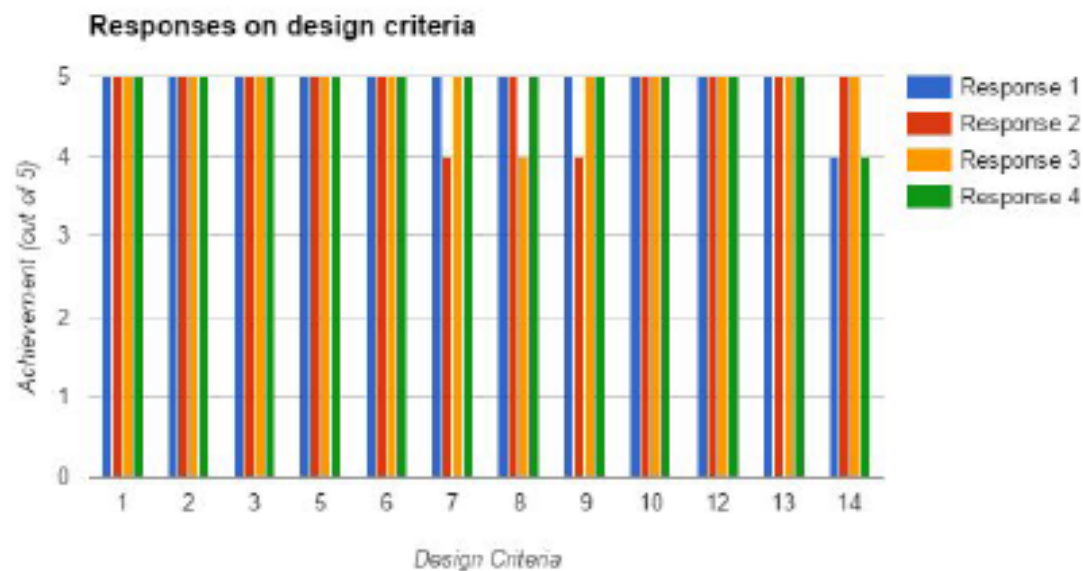
Evaluation against the criteria

How well does the game achieve each of the design criteria?	Response 1	Response 2	Response 3	Response 4
Be a tower defense game	Fully achieved	Fully achieved	Fully achieved	Fully achieved
Include an introduction and game over screen	Fully achieved	Fully achieved	Fully achieved	Fully achieved
Let the user build, upgrade and sell towers	Fully achieved	Fully achieved	Fully achieved	Fully achieved
Have a system in place that aligns values to 'tiles'	Fully achieved	Fully achieved	Fully achieved	Fully achieved
Display health, money and round number	Fully achieved	Fully achieved	Fully achieved	Fully achieved
Let the user spawn rounds of enemies	Fully achieved	Fully achieved	Fully achieved	Fully achieved
Show the range of towers	Fully achieved	Mostly achieved	Fully achieved	Fully achieved

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Show the remaining health of enemies	Fully achieved	Fully achieved	Mostly achieved	Fully achieved
Detect if enemies reach the end of the path	Fully achieved	Mostly achieved	Fully achieved	Fully achieved
Let the user pause the game	Fully achieved	Fully achieved	Fully achieved	Fully achieved
Detect if the game is lost	Fully achieved	Fully achieved	Fully achieved	Fully achieved
Detect if the game is won	Fully achieved	Fully achieved	Fully achieved	Fully achieved
Demonstrates my personal technical innovation.	Mostly achieved	Fully achieved	Fully achieved	Mostly achieved

Evaluation against the criteria, visualized



Comments

Any comments regarding how the product met the criteria? (3 responses)

The game definitely hit most criteria. Although basic, the game shows great technical skills and is very functional as a game.

The product met the criteria as it did what it was supposed to do.

Nope.

Any comments on the product in general? (3 responses)

The base game is good, and the only way to improve the game is to add more features like new game modes, new towers and new enemies.

The game is very good and creative and many people would love to play the game.

Say which wava you made it to instead of how many you completed.

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