Project Analysis:

# Problem Identification:

The video game market is overly saturated with not challenging, rewarding nor stimulating games, which can be easily completed and there is not much depth to them. In these games there is usually a guide and help given to the user which does not make the user think for themselves. I grew up with the Nintendo Gameboy Advance SP and Sony PlayStation 2 and 3; video games on these consoles were challenging and made the user think. They would show a problem and tell you to solve it; modern video games tell you *how* to solve it. The issue I have faced is the lack of retro-metroidvania, platformer games in the market which resemble the old games such as the Metroid series.

Although there is a gap in the market for challenging games and decreasing amount of people playing metroidvanias, the challenge is inherited from the game’s niche therefore players sometimes find it frustrating and stop playing a game completely if it is too hard. Therefore, I think a new feature to a metroidvania which would allow more player interaction and for longer use of the game is different difficulty levels to be more accessible to players of all skill levels whilst keeping that level in challenge that makes a metroidvania a great game.

# Stakeholders:

My *target* stakeholders are males, from ages 10 to 24, that really enjoy metroidvania or problem-solving games. For example, a boy of age 12 who really enjoys playing Nintendo games such as Zelda and Super Mario franchises or any 2D games.

For my initial research on the market’s opinion on the matter, I will create a survey and try to make as many people as possible to answer it so that I have a variety of opinions to help me make a better representation of the market.

I will do this by making the survey an online survey using a platform called SurveyMonkey; this way I can share the link to the survey on as many platforms as I can and reach out to more people than if I were to make the survey on sheets of paper and share it physically. Another positive of creating the survey online is that the stakeholders will be able to complete it in their own time at home or wherever they wish to without the pressure of me, the researcher, being there which could introduce bias in the research and data. Another source of bias could be in the opportunity/ convenience sampling like approach to this study, where most people answering and taking the survey will be of interest to the survey. Although this is could negatively affect the results, I will continue to use this method as it will enable me to reach out this research to as many people as possible.

After that I will choose a group of a smaller proportion to be the sample stakeholders, and these will be the people giving me feedback of the rest of the project, this group will be of highly accessible individuals such as friends, teachers and class-peers.

The stakeholders could include class-peers from both computer science class, other classes or neither. Teachers of mine of computer science, other subjects or neither as some may have experience or could help me and can give me impartial feedback. Friends and family as they are more easily available and can get a fast response. My last selection of people that I will be using will be clients, people that are genuinely interested in the final project and it being functional. These will be extremely helpful as they will know what they want, and they can be critical about it.

# Solution Description:

My solution to the problem is to create my own game and include all the enhanced, modern features to create an interesting game.

## Solution Details

I will use the programming language Python as is allows for object-oriented programming which will make my code more complex, reusable and efficient; with the addition of public modules such as Pygame, tkinter, Math, mySQL, GUIZero. I will also create a library myself with common and useful modules to make the game script shorter, easier, and quicker for me to code. I already can code in Python, and I am familiar with the public modules I will be using which makes me feel more confident in the success of the project. I will insert the use of multiple language such as C++ and SQL when needed for specific tasks to make a more complex project.

I will use Pygame, Tkinter and GuiZero Python modules to create my interface for my user; these modules will help me create a good-looking graphical interface which will appeal the user and make my game more fun and enjoyable.

I am going to use IDEs to make my time programming more efficient, I could use IDLE but a more sophisticated and helpful IDE I will use is Sublime Text and PyCharm.

I will use the Waterfall programming style to create a first prototype then keep improving after. The benefits of this are that the project will be easier to understand from the documentation as there is a clear, set phases to follow in the project's timeline. Another benefit is that there will be less project creep due to there being fixed requirements and clear analysis completed beforehand which makes identifying potential bugs and problems much easier and saves a lot of time. This also allows me to leave the project once it is completed with no maintenance.

I have a large scope with this project and making it will be difficult and take a long time, but I’ll try my best to hit my success criteria as much as possible in the time frame identified. I will work my way down the success criteria list when creating my game to ensure I don’t forget anything. It will be difficult, but I believe in my programming skills and my ability to learn as I make the project to keep up with my large scope of the project.

# Success Criteria:

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| **Features** | **Explanation** |
| Mobile Phone game | My first build will be for a PC, but one goal is to build it compatible for a mobile phone which will help me obtain one of the main goals of increasing accessibility and familiarity of the genre as mobile games are far more popular than PC games. |
| To create an interesting story line | To create an interactive story-oriented game which keeps the user always involved with the story. To also create an interesting Greek Mythology setting to the story by using famous icons to make the user feel more familiar with the characters from their previous knowledge |
| To make the game rewarding | To create a progressive aspect to the game to make the user feel rewarded for playing the game and keep them involved throughout the game. I will do this by making the user find better ‘gear’ in the game so that his player gets stronger. Another way of doing this is by adding a currency into the game, each enemy dead will drop coins and with the coins, they can purchase cosmetics for their character or new ‘gear’, consumables and skills. |
| Make the game relatively realistic and smooth | To make the in-game physics of the character and enemies realistic and understandable. To ensure that the game runs smoothly with no glitches or bugs, I will do this by making sure the time complexity is efficient and by making my code robust by using OOPs concepts. |
| Make a functional and understandable game map | To load and render separate ‘map chunks’ individually. Each map chuck is stored in a CSV file, each value referring to a specific tile. CSV files will be stored in a 2-D Array in the same way the map looks for easy tracing. |
| Make a functional and familiar pre-game home screen | The pre-game menu will include widgets, buttons, blimps and a background. Two different options: ‘create new account’ for new players and ‘log in’ for existing players. When a new account is created then a new record will be created in the database. When a user logs in a connection is made with a database and details are verified to make sure the account exists before the record will be searched for in the database and the data will be loaded into the program. |
| Have a pause menu | Have a button in the corner of the screen in the game for quick access to the pause menu; from here the user can access different menu screens, including map, progress, character, options menu screens.  Options menu: adjust audio volume, button layout, mute sounds, difficulty.  Character menu: view different gear and what upgrades are currently equipped. You can view the different items to find out more about them.  Map menu: view where the character is currently on the map and view identified items  Progress menu: view how much of the story has been completed (what gods have been identified and saved) |
| Have different types of quests in the game for the user to complete for more variance | To implement boss battles to progress in the main story of the game and save the gods and obtain new items, completing these quests will improve the character’s health and strength. Have side quests such as obtaining an item from somewhere else and bringing them back to the saved boss to get them ‘blessed’ and obtain a new skill which changes game mechanics such as “ability to run”. The game difficulty will increase as the user plays but completing these quests ensure that the character is always strong enough to continue, there is the option to not complete these side missions, but the game will be considerably more difficult for the user. |

1. Mobile game
2. Story oriented
3. Develop characters/ make them recognisable to that know about Greek-mythology (discovery)
4. Add a currency
5. Create a fully functional game with functional physics and little to no bugs (time complexity)
6. Load each section of the map from CSV files into the game. Also string multiple CSV files to create an understandable game map.
7. Homepage with a ‘signup’ and ‘login’ widgets, blimps, and background
8. When a player signs up, a new account is made and saved to a database
9. When a player logs in and/or sign in, a connection is made with a database and details are verified to make sure the account exists before starting the game
10. When the game is playing ‘options’ widget in the corner for the player to access to modify game settings such as the sound volume, muting certain sounds, difficulty settings, save and load, etc.
11. Another widget to bring up the game map and show where the player is on the map
12. Have identified items show on the map
13. Have another widget for player customization such as different gear and see what upgrades the player has on currently
14. Another menu screen to see all the progress made
15. All these widgets can be put into a menu accessible by only one widget in the corner for less cluttering
16. Create a story to the game which has a theme of Greek Mythology to make the game interesting and to create a background story
17. Have little boss battles to gain items and free the gods
18. Have different side missions such as bringing items to gods to get them blessed
19. Blessed items are accessible in the customization menu to use and find out more about
20. When blessed items are unlocked and equipped, different game mechanics are used
21. Each freed god can be seen in the menu for the player to see what they have accomplished
22. Each freed god will increase health and strength
23. Every part of the map will be accessible from the start, but it will be harder to progress if previous parts of the game are not completed first

# Why is this a suitable project:

This is a suitable project because it will show my skill with object-oriented programming. It will be suitable because it will also be an opportunity for me to highlight computational thinking within the processes of the project. My main objective for this project is to remaster and modernize a loved-by-many genres of games to make it more accessible and fun to people in today’s time. I will do this by adding more player customization and control over the settings of the game such as save files, difficulty settings, sound settings. I will also add an interesting storyline for the user to get involved in. Save files and difficulty settings. Each one of these sections will need thorough planning and computational forethought for them to be successful. This is important because the gaming industry can be very judgmental and meticulous about games and their quality so for this game to be a success in the real world, I will need to make sure that everything is thought out; the less problems there are, the more recognition the game gets, the closer I get to my goal of reviving the dead genre of metroidvania games. I will also create all the pixel art on my own using a web application called Piskel, from characters, enemies, allies, animations, special effects, items, background items, and backgrounds. This will ensure there is a unique experience and environment for the user to play in.

# Requirements:

I have set my requirements for the user low to ensure access from as many users as possible as one of my main success criteria is to make metroidvanias more accessible and known; therefore, having a low entry level requirements will encourage more users to play my game.

## Hardware

The hardware requirements for the user to be able to play my game successfully are low, the user will need to have a computer and a keyboard to play my game. Mouse, Webcam and other peripherals are not needed.

## Software

As stated in my success criteria, I am planning to make my finished game an executable therefore little software requirements are needed for the stakeholder to play my game such as having a functional operating system downloaded on their device. If I cannot make the application into an executable, the user will need to have python, and all the packages I use installed on their device.

