A' Level OCR (GCS A) Computer Science Project
H446-03/04
Clara Bernstrom Girvan
Candidate Number: 7009
Beaumont School - 17511

Contents:

1.1 Description of the Problem

I am going to create an action/adventure platform game that is composed of multiple levels each with a range of enemies trying to kill the player, the overall objective of the game will be detailed in the narrative, but put simply, it will involve reaching the end of each level, by moving across the terrain, defeating enemies whilst taking as little damage as possible and collecting coins. Throughout each level, there will be several obstacles; the enemies – which will become more challenging to defeat as the player gets more skilled, as well as traps such as pits that if the player falls into, ends the level.

In current systems to date, there are some key aspects that make up a good platform game. The narrative, however basic, usually plays a significant part as it provides the users with a long-term goal to reach in the game, rather than meaninglessly completing levels which wouldn't be very engaging. During development, I will be refining the storyline further however, my basic concept lies in the realm of fantasy as it would allow for more freedom – nothing must be "realistic" to an extent. I will be setting the story in the medieval era; the main character that users play as is going to be a lone knight that is on a journey of some kind; the user will be progressing through dangerous lands filled with enemies to reach the end goal. Furthermore, I will have some form of similarity amongst all the enemy sprites in how they attack or look across the levels which means the player learns how to fight them and becomes familiar with the game, so their skill can progress. The user's attacks will mainly be composed of sword strikes or something similar; however, should I have time in development I might add some sort of sorcery such as fireballs to the attacks available. As for the controls, I plan to allow some customisation of them, but the default set up should be good for all users. I will be looking further into this in my research.

Overall, each level will need to have a clear path for the user to take and enemies walking around in an area; these may be individuals or groups to provide more of a challenge and they should react upon seeing the user sprite and attack. Key stats such as number of kills and a health bar should be shown to the user. It will also require a title page, a level selector and game over screen for the user to interact with the game, see their progress and then know if they have lost all their health. Some sort of basic tutorial would also be beneficial to introduce the user to the game.

For the graphics, I will be taking inspiration from Feist, Limbo and others in which the foreground and sprites are a solid black silhouette, with the artwork being focused on the background. This would cut the time necessary to create sprites down significantly, and quite possibly look better as I haven't got much experience in character design – ultimately, I would just be creating the shapes of them/ animating it.

1.2 Stakeholders

The target audience for my game will be rather broad; but it's important to identify a suitable age range that I will be aiming for as some features are not suitable for younger audiences. So, I am going to target the 12 – 18 age range; the mild violence that will be present coupled with the dark nature of the graphics/sound effects means that realistically the game isn't suitable for younger children and so be rated a PEGI 12. In this range, I will be targeting those who enjoy action/ adventure platforming games that have a narrative and with some experience playing PC games rather than mobile. This is because many in this group play games in their free time after school etc. and are willing to dedicate many hours into a single game should it be engaging enough. More casual gamers may prefer mobile games instead, but I want to make it more of an engaging experience rather than just something people play waiting for the bus etc. Therefore, my game will need to have enough features to keep them interested and take advantage of the dedication they can put into a single game by making it enjoyable for them to play.

I have two specific examples of stakeholders in this category to interview, both of which are 18 and therefore in the upper end of my age demographic. However, this is because I feel they will give the most detailed and useful responses that I can build upon. Whilst many younger people in the range play games, I doubt they don't consider questions as carefully to the same extent, so I probably wouldn't get answers that will genuinely be as helpful. One of my stakeholders, Eleanor Foster, has played RuneScape and Skyrim a significant amount and therefore will be able to give some suggestions to the medieval theme I have and the other, Hannah Blackmore, has played many platforming games. Combined, the opinions and feedback expressed will allow me to decide the features I will be implementing. Furthermore, I will be able to contact them regularly and ask questions or show them prototypes throughout the project as I am in the same year group at school and we talk regularly.

1.3 How can the problem be solved by Computational Methods?

Abrtraction and Visualisation:
Thinking abstractly refers to "removing unnecessary details and including only the relavent details".

- The game will be in 2d only and with minimum details, therefore abstracting from reality. For instance, the foreground terrain will be cast in shadow (filled in black) reducing the details. (See research for example).
- Instead of drawing the sprite in great detail, I will be drawing its outline that will be filled in black.
- The fighting will be simplified to a less realistic style with just a couple animations for the movement of weapons, for instance swinging a sword and a bow being drawn.
- The bare minimum stats a player needs to know will be shown, their health, potentially lives, coins/points and the number of enemies killed in that level.
- I will have basic sound effects; the walking sounds will be the same for each sprite.
- There will be a menu to change the sound options and others such as controls.
- The icons on the menus will be simple consisting of colours that fit the theme of the game, any icons will be created using SAI. As for font sets, I will be using one that is already available – yet to be decided.

Thinking Ahead
"Thinking ahead refers to identifying the preconditions of a system, the inputs, outputs and reusable components". This will particularly link to the coding aspect of the project; when creating scripts I will have to ensure that all inputs and outputs are known prior to coding and that for any functions to run that the prerequisits are met.
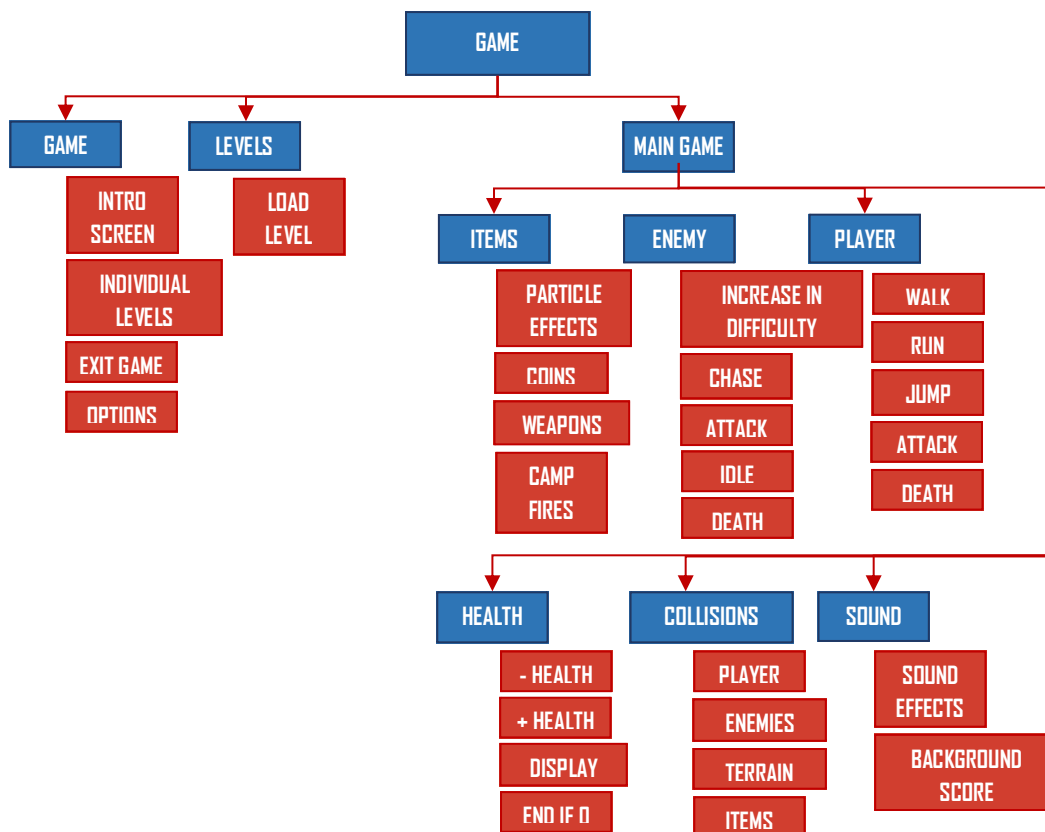
- I plan to use the unity game engine and C# to create the game.
- As for the project, there are a range of inputs that need to be documented/ considered. At a basic level it refers to keyboard inputs to move as well as mouse clicks that will allow the user to move the character on the screen and perform any actions. As for the code itself, there will be a vast range of variables that I will need to keep track of to ensure that any functions I write get the correct inputs to prevent the game from working incorrectly.
- In terms of outputs of the game it will be the graphics; moving sprites and side scrolling backgrounds/ foregrounds. I will also be implementing some background music. As mentioned previously, it will also refer to the variables I keep track of when coding
- Thinking ahead will also refer to trying to find solutions to any particular issues I have on my mind that I encounter when designing the game through research.

Thinking Procedurally
"Thinking procedurally refers to breaking a problem down". In other words, I will be identifying individual events that relate to each other and that can be coded seperately. This will allow for the modularisation of code for instance creating a single jumping function across all moving objects".

- The game itself can be broken down into several smaller components each encompassing a single aspect such as the movement, sound effects, enemy fighting etc. These big tasks can then be broken down into their own procedures, ultimately resulting in individual functions, perhaps inside classes. These will then only need to be coded once and can be applied to many objects/sprites provided the function has the necessary parameters such as sprite position and the speed it can use to make it function properly. (See the diagram on next page)
- There are severall game states; the title/ opening screen, the level selector, the menus and then a game state for each level itself. Overall it makes the game very clear and simple for the player to use. Out of all the game states present, the level game states themselves are the most important parts of the game – without them there would be no game to play.
- The coins collected and kills will contributed to a final score alongside the amount of health they have left by the end of the level. This will all be done through a function run at the end of the level (there won't be a running score displayed).

Clara Bernstrom Girvan   Candidate No: 7009 Centre No: 17511

Modular Breakdown of the Game:

```
                                    GAME
          ┌──────────────┬──────────────────────┴──────────────┐
        GAME          LEVELS                              MAIN GAME
     ┌────────┐    ┌──────────┐          ┌──────────────┬──────────┬──────────┐
     INTRO         LOAD                ITEMS          ENEMY      PLAYER
     SCREEN        LEVEL
                              PARTICLE            INCREASE IN      WALK
     INDIVIDUAL               EFFECTS             DIFFICULTY
     LEVELS                   COINS               CHASE            RUN
     EXIT GAME                WEAPONS             ATTACK           JUMP
     OPTIONS                  CAMP                IDLE             ATTACK
                              FIRES               DEATH            DEATH

           HEALTH              COLLISIONS            SOUND
        - HEALTH              PLAYER              SOUND EFFECTS
        + HEALTH              ENEMIES             BACKGROUND SCORE
        DISPLAY               TERRAIN
        END IF 0              ITEMS
```

Thinking Logically
"Thinking logically refers to identifying decision points for branching or iteration".

- Throughout the game there will be several conditions however, many will be running continuously such as the main game loop. They are responsible for handling key tasks such as accepting user inputs and acting on them – updating the game state and drawing the game based on this. Usually the game loop consists of player actions; running, walking, jumping and fighting etc and other constant conditional functions.
- At a higher level of abstraction it includes any choices or decisions the user makes in any menus – for instance options, or selecting to start a new game or choosing one in progress etc.
- Other conditions include making sure the user still has some health remaining to continue the level. It also includes collision detection to see if the user has been hit by weapons or fallen into a pit.

Thinking Concurrently
*"Thinking concurrently refers to more than one thing hapenning at the same time".*

- I will need to consider concurrent thinking when implementing the game sounds as it will include background music and sound effects executing simltaneously. For instance, while the main music plays in the background there will still be other sounds such as the character walking or jumping. It will also include sounds of sword movements and more. Alongside this, the game logic will be updated too.
- Another example is movement; it's likely the user will be walking/ running while attacking opponents and it would cause issues if the user is only capable of one movement at a time, Simulatenousely it applies to enemies which will be moving at the same time as the user during fights.

1.4 Research

Ninja Arashi:

Ninja Arashi is an action/adventure platform mobile game; it follows the story of a legendary ninja who is fighting to try and save his kidnapped son. It involves playing through levels fighting against enemies with a sword, ninja stars and great jumping and disguising abilities and navigating through terrain filled with dangerous traps. I will be conducting a much more detailed analysis as it closesly matches the type of game I am trying to create for my solution.Ninja Arashi has a clear narrative that provides the user with a goal to complete in the game, Arashi's wife is murdered by Orochi and his son kidnapped; its up to the user to reach the ninjas son and it's summarised at the start through cut scenes.

Below I have summarised the key features of the first few game levels:
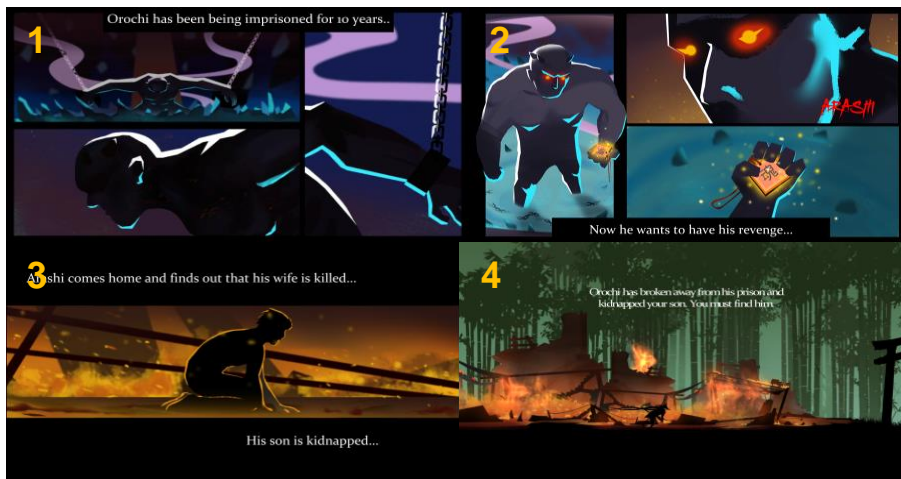

Left is the storyline which is presented at the start of the game; the comic style appeals to a younger audience (its pegi 12, so round this age) and makes it very easy to follow as there's limited text. As this is a mobile game it is more suitable as people are likely to be playing it when they have a spare moment. The colours all fit together and create an overall dark feel to the story.

Title Screen:

To the right is the first things that the user sees when playing the game; the level selector and the shops in which they can spend the items collected during the game. For instance, diamonds and gold are usually found in pots that are broken by ninja stars or in hidden areas of the game.
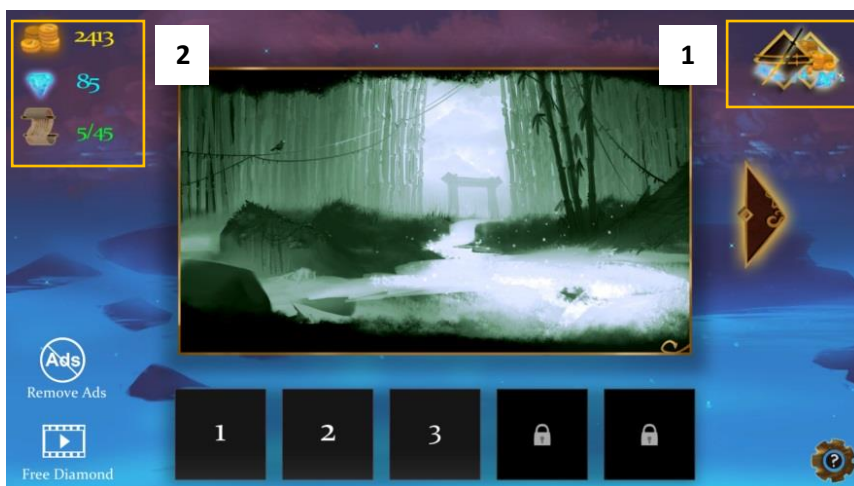
Level Selector Screen

The first menu is where the user gets to select the levels they play and see their current progress. They are not able to advance if they haven't collected enough scrolls in the levels – shown in the top left-hand corner.

1. The small icon at the top right gives the player the chance to spend the gold and diamonds they have collected. You can buy costumes that decorate the sprite, upgrade the skills and purchase more gold and diamonds using real money.

2. The diamonds and gold are used to buy customisation options and level up the skill of the user. The gold and diamonds are found in the levels themselves.
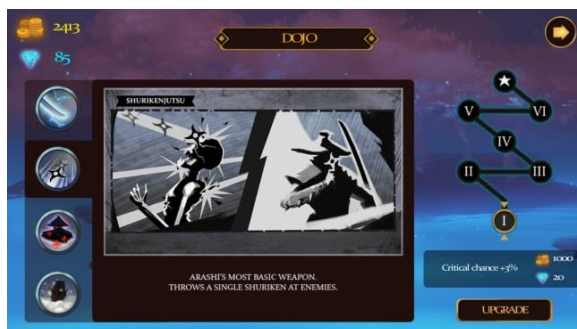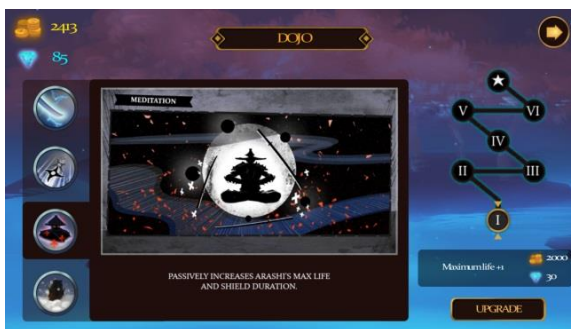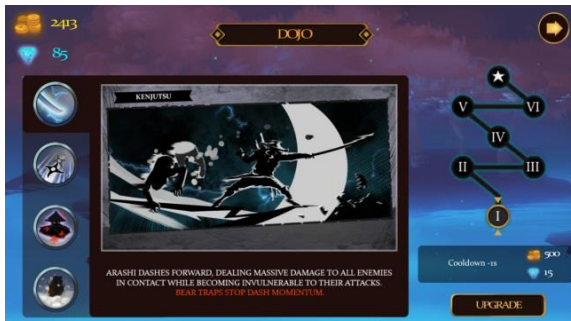
5

Abilities and shop:

Ability/ Shop Menu:

Accessed by clicking the button at the top right, shown by 1.

The dojo allows the player to upgrade their ninja using coins and diamonds collected in game, to make them stronger. The costume shop adds some customisability to their experience.

Note: I will not be researching the third menu option in which you buy more gold and diamonds as I will not be adding such purchases to the game.

In Game Tutorials:

These are two examples of the tutorials/ information presented; in this case one is for traps and the other is for an item, the portal scrolls, that are used to unlock the next level. This makes sure the user knows exactly how the game works, what they should look out for and need to know. And it is presented concisely.

You just need to tap on them to remove them from the screen.

The graphics make them particularly easy to understand and memorable. There's only a small amount of text making it suitable for a short tutorial.

Overall, they provide information on all the features; the weapons, special abilities, actions and more.

Clara Bernstrom Girvan   Candidate No: 7009 Centre No: 17511

Menu/ Settings:

Pause menu, allows you to resume, restart, settings and main menu.

Settings are rather minimal; the only options are master volume controlling sound effects and the option to turn of music.

Basic Features:

Ninja Arashi, the user's sprite

Obstacle destroyed with shuriken.

Enemy sprite

Pause button for the menu.

The top left part of the screen shows some essential stats; number of lives, gold, diamonds and scrolls. Each of which are significant in the game.

These icons are how you control any fighting, movement or special abilities, as this game is for mobile you click these to execute them. They provide a very clear visual representation of what these do, and during the tutorial part of the game shows what each button does.

Chasm, player dies if they fall in here

These buttons control the characters movement from left to right, there is only one set speed to move unless you use the special ability.

Hidden area found by shooting shuriken's at the wall.

Use of Height in the levels:

The buildings provide different heights for the user to reach. The black sections cannot be moved through whereas the thin grey walls aren't obstacles.

The room with the pots is secret, and blacked out until shuriken are thrown against it. Inside these pots there are usually diamonds or other items.

The enemies in the buildings usually remain in that area and attack once the ninja sprite is sighted. However, it's extra challenging to fight here as you can't jump when under the roof.
The pots seen here often contain items such as diamonds and gold that can be used to trade for items within the game.

Clara Bernstrom Girvan   Candidate No: 7009 Centre No: 17511

Movements and Actions:

Buttons 1 to 3 represent various actions the sprite can do, each one has a certain cooldown period preventing them to be used repeatedly; button 1 can be pressed almost all the time with a cooldown of less than a second whereas buttons 2 and 3 represent stronger abilities only able to be used every 10 seconds. This is shown by the buttons being greyed out and a swiping clock style movement revealing it again. During this time the button cannot be pressed.

1) The first button causes missiles (shurikens) to be shot, each enemy requires a minimum of two hits from a shuriken to die.
2) The second button transforms the user into a log which prevents enemies from seeing them.
3) The third button makes the user dash with a sword essentially increasing their speed and increases damage inflicted.
4) The fourth button makes the user jump.

This shows what the second action does; it disguises the ninja sprite as log making you invisible to the enemies. In this state, you can move left or right even fall and remain the same log and to deactivate you simply press another action.

I couldn't provide screenshots of the 1st and 2nd buttons in action as they don't last long enough to take a screenshot. The same goes with the fourth, allowing for jumps but the important details to note is that you jump up to about half the screen and you can double jump by pressing the jump button once again.

The left shows button 2 during the cooldown period described earlier. In this time the user is not able to press them/use the ability.

Levels and checkpoints:

The golden gate represents the end of the level, once passed it is completed.

These are merely shadows until passed, at that point them light up and serve as a checkpoint that the user returns to if they die and still have lives left.

Items:

The pots seen here often contain items such as diamonds and gold that can be used to trade for items within the game.

Clara Bernstrom Girvan   Candidate No: 7009 Centre No: 17511

Features:

Game Feature	Justification for implmenting it
Title Screen	I will be adding this as it introduces the user to the game they are playing.
Cutscene	The cutscene is where I will be putting the majority of the narrative. This is to introduce the user to any goals that they have to complete but by confining the majority of it to a part of the game it means those who don't want to engage in the narrative can skip it. I might add further detail at the end of levels however I have not yet decided.
Tutorials	Tutorials were particularly useful in explaining how the game worked and demonstrated each action and the possible traps so it made learning how to game much easier. Again, a skip button would mean those users who want to figure it out on their own/ already know how to play the game can ignore the tutorials.
Pause menu	Pause menu means the user can stop playing through a level at any time and resume later on. Without this it means the user has to dedicate more time to playing and might become frustrated that they have to play each level at once with no breaks.
Settings	Settings in Ninja Arashi allows the user to change the sound controls, but when I implement it I hope to have more changes to make – nameley the default controls to allow perhaps PC gamers to use the mouse if they want to.
Basic Movements	I will be using similar movements to Ninja Arashi; left right and jumping functions so the player can move across the levels and move around enemies.
Sword attacks	Sword attacks will be useful in clearing any obstacles, defeating enemies and more. Without the weapons the user would be left defenceless throughout the levels.
Missiles	Missiles are something I will aim to add should I have more time left over during development; However instead of shurikens I might add flameballs or something similar that can be explained by sorcery. In Arashi, the shurikens were particularly useful in killing enemies at long range which allows for a stealthier approach. This gives the user multiple options of gameplay strategies which would make it more engaging.
Key stats	The key stats in Ninja Arashi show the collected items throughout the level; in my implementation I will likely show the healthbar, kills and collected coins so the user can see their progress throughout the level.
Obstacles	Obstacles such as crates and pots provide another part that of a level that the user can interact with.
Traps	Similar to objects, it's something more to interact with but in this case adds an additional challenge that could end the progress within the level.
Different enemy classes	The different energy classes in Ninja Arashi weild different weapons such as short and long range. They provide different challenges that the user has to develop a solution for and so makes the game more interesting by reducing repetitiveness.
Heights	Heights are a classic parts of a platform game. It adds multiple routes through a level; in Arashi it adds different options to defeating enemies and reaching other items. In my own game I don't necessarally plan to achieve this through putting up buildings but some objects and fit the theme. For instance, if the user is going through a forest then perhaps rocks can be used to get height.
End of level	The end of level in arashi tells the user which items they have collected, which I will do in my game alongside the kills, remaining health and points accumulated.
Items	Coins.
Shop	This is where the player will be able to use coins collected in the game; I think I will be keeping upgrades limited to health etc. (so increasing the amount of damage they can take). However, this is a feature I will implement only if I have enough time.

Clara Bernstrom Girvan   Candidate No: 7009 Centre No: 17511

Features I won't be implimenting:

Game Feature	Justification for not implmenting it
Purchases	This links to the idea of an ingame shop to upgrade certain features. I don't want to involve real money into the game for instance to buy more coins to use in game as then it wouldn't give the users any challenges in the earlier levels in which they player shouldn't have maximum level health, but this may be the case if they simply bought coins to expand on the health.
Checkpoints	Whilst I like the idea of checkpoints in the level, I don't want them to reach a length that would require a checkpoint to realistically complete it. Furtheremore, my plan to implement the health bar is how I am compensating for no checkpoints because unlike ninja arashi, the user won't die from one hit in my game, rather be able to sustain some damage and still continue through the level.
Cooldowns on Actions	The actions that my user can use are movement (L,R and Up) and then any weapon strikes, so a cooldown isn't applicable.

Feist:

Feist follows a small creature fighting in a hostile environment to escape a pack of predators. The gameplay shows desperate encounters in which the user has to use sticks, rocks and pinecones from the environment to fend them off and to get around traps. Overall, the gameplay experience in Feist looks fantastic; the sounds perfectly complement the graphics which are stunning. Ninja Arashi provides research and ideas for the gameplay itself, whereas I'm using Feist for ideas for the graphics and how background music/sound effects can create an eerie feeling in the game.

Graphics:

Artwork concentrated on the background that scrolls alongside the player movements.

Particle effects that float around on the screen.

Water reflecting the foreground adds a particularly nice effect.

User Sprite

Shadow foregrounds and sprites makes it simpler to design graphics that look very aesthetically pleasing.

Example cut scene that looks just like the rest of the levels.

Each level has a colour theme. Some take part in a forest, others near water and others in caves. All have the same art style.

Audio:

Sound effects: Feist uses sound efffects for most actions and movements seen and it adds a whole new dimension to the game; for example flying sounds for the enemies and creatures hovering in the air, footsteps which changes based on the material the sprites are on, crickets and flies, movement of materials and also traps. In other words, it recreates any sounds you would expect to hear. There's background music consisting of calm and eeire music that provides a very imersive atmosphere but it becomes more intense at certain points. Overall, this game is a great example of how sounds and visuals can create a mysterious feel that draws the user in.

Feist has significantly less features than arashi to implement this is because im researching it as an example for graphics and audio rather than gameplay itself despite it being similar to the solution I intend to create.Therefore I'm not going to summarise the features not to include as I was researching Feist only for graphics/ audio.

Game Feature	Justification for implmenting it
Sillhoutte Foreground	I think that it provides a very aesthetic look to the game with significantly less work on the artwork. This is particularly good for my project as I have no experience designing video game terrains, or landscapes of any nature. Therefore, It will reduce the time I will need to spend researching possible alternative art styles such as Pixel Art and the time spent actually creating the funcitonal sides of things.
Sprites as Sllhouttes	This is simiilar to what I stated above, and again, it will save significant amounts of time in the development stage as I will not have to focus as much on the artwork side of the game or learn things like pixel art. Instead I just need to come up with a rough sketch of how each sprite will look and create a sillhoutte digitally and animate it for movement.
Scrolling Background	This will give the user the sense that they are making progress in the level. Furthermore, this is where I will be concentrating my efforts in the graphics as it provides most of the colour and detail the user will see.
Scrolling Foreground	This will be where the user is moving across and also show some progress in the level. It will be moving at a similar speed to the background to try and create a scene.
Particle Effects	This will be implemented should I have enough time during development as it'd be a nice touch to the visuals of the game, however it isn't as necessary as other features and therefore shouldn't be prioritised.
Background Music	Background music creates a sense of atmosphere in the game and creates a better gaming experience which will draw the players in. As I have a experience with instruments/ various programs for creating music I will attempt to create this myself provided I have enough time in development, if not I can attempt to find some online requiring no liscence to use.
Sound Effects for Movement	Sound effects for movement add another dimension to the game, and creates a more realistic feel to it. Whilst they won't be overly complex I hope to be able to add sounds for the most basic movements such as walking at the very least. The sounds themselves will be found online to focus work on implementing them rather than creating them during development.
Nature Sound Effects	This will be something I add if I have time during development these will be basic kinds of sounds you would expect for that kind of environment and again sourced online. Similar to the above, it makes the scene more realistic and adds another level of detail.

Clara Bernstrom Girvan   Candidate No: 7009 Centre No: 17511

Interview Plan:

During the interview, I want to get some opinions and suggestions for my proposed solution from a relevant stakeholder, Orange represents Eleanor's answers and blue represents Hannah's answers. Both stakeholders were introduced at section 1.2. With this I can get inspiration of what to create, any specific features it needs to have and other key things such as the controls. Ultimately it provides an insight into what kind of games they would play and it allows me to create something that users would find engaging and worth their time. Below are the questions I propose for the interview, they are divided into 3 key elements; Sounds/Graphics, Controls/General Info and details regarding the User Character/ Enemies. This is because they have varying level of importance; the general game information/controls being the most significant as it inspires the very core game ideas and therefore, for reference in future it will be usefull to have the responses categorised.

Controls/ General Game Information:

➢ What kind of controls would you like? Eg. Arrow keys/mouse or WASD, Space bar, mouse.
   o Do you think there needs to be an options menu allowing you to change the controls?
➢ Should the game be simple or have lots of complexities?
➢ How long do you think each level should be/ how many in total?
   o Should there be a time limit for each level?
   o Should there be an area on the screen telling you your progress through the level?
   o Should the user defeat a level, should there be a "celebration" like in mario?
➢ Do you have any suggestions of how the game difficulty could increase?
➢ How would you like it to be scored – by kills or collecting items? eg. coins.
➢ Do you think the user should have some sort of health level indicating damage or lives lost?
➢ What kinds of things should make the character "die"?
➢ Do you think there needs to be a pause button?
➢ Is the narrative a key feature?
   o If so, should it all be presented at the beginning of the game?
   o How important should it be?

User Character/ Enemies:

➢ Do you think the enemies should become more challenging to defeat as your skil increases?
   o Should the enemy sprites be different types Eg. Swordsman, archer.
   o Should the enemies be human or a mystical creature?
➢ Which degree of customisation of the sprite should be involved.

Sounds/Graphics:

➢ What kinds of sound effects do you think the game should have; any examples?
➢ As for background music, would you prefer some kind of "theme" throughout the game or rather simple scores that fit the mood of the scene at the time.
➢ Should the style of the menus and start screen reflect the game?
➢ Are there any other things you wish to add about sounds or graphics I havent asked?

Clara Bernstrom Girvan   Candidate No: 7009 Centre No: 17511

Interview Summary:

The two respective stakeholders are shown in orange and blue.

Controls/ General game info:

What kind of controls would you like? Eg. Arrow keys/mouse or WASD, Space bar, mouse?

- "I think the controls really depend on if a user is on a PC or a laptop; the mouse should definitely be avoided if they are using a laptop as its just impractical when you're trying to play games, WASD has become the standard now so I would stick with that and maybe the space bar to use weapons."
- "Definitely stick to a keyboard set up as it lets the users play well regardless if they're on a laptop or PC. Mouseclicks, would be good for a PC user for instance, to strike an enemy but as it's a platformer and there's no such aiming involved a button press would be equally good."

Do you think there needs to be an options menu allowing you to change controls?

- "I don't think its necessary as long as the keyboard layout is suitable, then it will be sufficient for most users."
- "I think that giving the users the choice would be an added bonus to the game, but default should be aimed at keyboard users"

Should the game be simple or have lots of complexities?

- "Some sort of puzzel solving perhaps"
- "Perhaps you could add weapons that you find along the way in the levels, this would give players a goal such as finding all these weapons."

How long do you think each level should be/ how many in total?

- "Perhaps an even number of levels like 6 in the short development time you have to complete the game".
- "Either many short levels or perhaps like 10 longer levels."

Should there be a time limit for each level?

- "I feel like the levels should get longer; the first potentially a few minutes only and build up to a big final level that would require more time to complete. Overall a time limit adds another challenge and a sense of urgency."
- It's stressful but good; it makes it more exciting but it can be annoying and frustrating if the time is too short."

Should there be an area on the screen telling you your progress through the level?

- "Perhaps, it would split the game up more as it would shift the users attention to the level aspect a lot more."
- "I don't think you should, not many other games do this, except for racing games."

Should the user defeat a level, should there be a "celebration" like in mario?

- "From what you've described , I don't think it would fit the overall feel of the game unles you made it very subtle.""
- "It depends if the levels will continue on from each other; if they do then no but if not then sure"

Do you have any suggestions of how the game difficulty could increase?

- "There could be a boss level where all the enemies swarm you. Perhaps nearly impossible to complete? A secret level?"
- "The enemies should definitely become harder to kill based on the players previous kills etc."

How would you like it to be scored – by kills or collecting items? eg. coins.

- "Scoring; you could do different times; either going through the levels quickly or do extra things and spend more time doing dangerous things to get more points. Could also have 3 lives and make it as far as you can then a score isnt necessary and so it's just how many levels you can get to."
- "Killing enemies should give some points or something similar, otherwise killing them becomes pointless. Items could be a bonus of completing levels like extra points."

Clara Bernstrom Girvan   Candidate No: 7009 Centre No: 17511

Do you think the user should have some sort of health level indicating damage or lives lost?

- "You should defintiely show the number of lives they have or they might die after being careless and not realising they had one life left. This would be really annoying if they had come a long way into the level."
- "Lives – yes, health really depends if you're going to make the user die after one hit or if they will be able to take several. In that case then it has to be shown."

What kinds of things should make the character "die"?

- "The usual, enemy hits, chasms, potential traps."
- "Being hit by oncomming enemies, taking fall damage perhaps and like in mario where you fall down between two bits of land."

Do you think there needs to be a pause button?

- "Yes, otherwise people are forced to play through a whole level or die to save progress and if you're just playing casually then it might get annoying."
- "Yes."

Is the narrative a key feature?

- "I think that'd be good; but even if its fantasy there should be some believibility to is if its set in medieval era (like don't start adding flying spaceships as it'd be weird if that wasn't the specific point of the game and just an extra detail."
- "It doesn't have to be very detailed but it adds more purpose to the game."

If so, should it all be presented at the beginning of the game?

- "Normally at least part of it is, if the narrative is a key part of the game then no."
- "Yeah, I think the user should be familiar with the story if you add a narrative, any extra details though could be presented between levels perhaps."

How important should it be?

- "If it's key then it should be emphasised, but not that important if the gameplay itself is the overall focus."
- "For platformers, it's less important than in open world games where you can explore sub plots and challenges."

--- **User/ Enemy features and attributes:** ---

Do you think the enemies should become more challenging to defeat as your skil increases?

- "Yeah, they then might require different methods of fighting which makes the game more interesting".
- "Definitely, it keeps it new and interesting and less repetitive. Can build up to harder ones."

Should the enemy sprites be different types Eg. Swordsman, archer.

- "Yes. You need to keep people engaged and make sure they don't get bored and this could happen if the enemies remained the same throughout; with different types of enemies it means people have to learn different types of strategies to complete the levels. For instance, you could have some enemies with long ranged weapons and others with short range weapons of high damage only."
- "That's essential – otherwise people wouldn't find the game as fun as you would quickly learn how to kill one enemy and be able to breeze through the levels without much though."

Should the enemies be human or a mystical creature?

- "Why not, you could incorporate it to the story"
- "You could have a mix, it'd make it more interesting"

Which degree of customisation of the sprite should be involved.

- ""It would be nice to change the character you play as but it isn't necessary for a good game."
- "Lots of customisation would make the game less serious and fun, even silly novelty things to collect".

Sounds and Graphics:

What kinds of sound effects do you think the game should have; any examples?

- "There certainly needs to be sound effects for basic actions, for instance sword movements, otherwise the game would feel less "polished" and lacking."
- "At the very least, it should have basic ones such as footsteps, sword noises etc. Once you complete a level there could be a theme song and different levels could have different music to present a different mood."

As for background music, would you prefer some kind of "theme" throughout the game or rather simple scores that fit the mood of the scene at the time.

- "I think it has to fit the theme of the game, so for a medieval theme it needs to have drums etc. In other words fitting the time period, You wouldn't expect to hear synthesisers as a background theme. It should relate to whats happening, for instance if an enemy is approaching you should hear eerie music as it adds to the experience,"
- "Main theme for significant points."

Should the style of the menus and start screen reflect the game?

- "It's not necessary but that would be a nice tough to add."
- "I think that would be quite good as it keeps the theme of the game"

Are there any other things you wish to add about sounds or graphics I havent asked?

- "Not particularly"
- "As the main part of the game will be in darkness you could add light sources like fire here and there for a cool effect"

Following an Interview, a number of key points were established:

Controls/ General:

➢ Stick to controls that use the keyboard alone to ensure laptop users can get a good default set up.

➢ An option to change these controls isn't necessary if its default keyboard only but it would be a good extra should I have the time to create it.

➢ Two suggestions; either add a puzzle element or to find extra weapons. Out of these two suggestions I would probably implement the second option due to the time restrictions on this project.

➢ Overall, I will aim to create 8 levels of a reasonable length with the last potentially being longer and harder to provide a final challenge to finish the game.

➢ A time limit was popular among my stakeholders; it creates an added challenge, so I will have to do extensive testing to figure out a suitable time limit in this age range.

➢ It won't be necessary to add a bar or something similar; I want my game to be somewhat immersive but by adding this it would draw the attention simply to how far a level the user is.

➢ Both stakeholders didn't seem keen on the idea of a "celebration" at the end of the level, as in Mario, I don't think it would be suitable for the type feel the game will have.

➢ The main idea I will implement is that the enemies get harder to kill based on some statistic such as the number of kills accumulated in a level – in other words as the user's skill increases so does the difficulty. I don't want my game to become too easy to complete and if the enemies were to stay the same as you'd just have to learn how to kill them one way. Eg. If their backs are turned.

➢ As for scoring, the simplest way would probably be to add a point per enemy vanquished and maybe do some calculations such as the damage they lost in that time to create a final amount of points to add. I might decide later in development to add something to the score based on any items collected – however I have not yet decided what types of items this would be.

➢ At the top of the screen a health bar to show damage taken to ensure the user knows when they must be particularly careful.

➢ The user will die if their health reaches 0 through enemy hits and fall damage but if they fall into a chasm they will die immediately.

➢ There needs to be a pause button.

➢ A narrative adds purpose to the game, believable for the time era of the game to some extent but it's not the priority. Therefore, I might add more depth to it if I have enough time during development.

➢ A significant portion of narrative will be presented at the start of the game, and potentially others during cut scenes between levels. It depends on if it's developed enough or not. At the same time, not all users will want to see the story, so I will add a skip button.

   ° My second stakeholder said that as it's a platformer it's not the most important feature, and stakeholder 1 said the only game where it really matters is open worlds. So, I will add a skip button, so they can pass if they want to.

User/Enemy Features and Attributes:

➢ The enemies should become more challenging to make the game less repetitive.

➢ Enemies should appear in different types/ classes such as swordsmen, archers to make sure the user must employ different strategies to defeat them and learn new ways to fight. Also, they should inflict different amounts of damage.

➢ The enemies are going to be a mix of human style/ fantasy sprites.

➢ I won't be adding any customisation to the sprites.

Sounds and Graphics:

➢ There will be sound effects for as many actions as possible; at the very least basic motion and sword motions. The sound effects will change for the wolf state.

➢ I will have some background music throughout reflecting an eerie/ mysterious mood. However, for the menus/ starting area I will add a theme of sorts if I have enough time to create this during development.

➢ The menus will reflect the theme to some extent, namely through colour choices.

➢ If I have time I will add light sources such as fires here and there to add light effects.

1.5 Features of the proposed solution

Feature	Justification and Limitations	Research
Title Page	This introduces the user to the game they are playing.	n/a
Narrative	A basic narrative provides the user with an end goal, but time restrictions mean this can't be too elaborate.	Ninja Arashi/ Feist/Interview
Tutorials in Level 1	Provides clear explanation to the users across the age group how to control their sprites movements, actions and about other features that make up the game.	Ninja Arashi
Pause Menu	The pause menu allows players to take a break from a level and not lose their progress. This will have a button to the settings.	Interview
Settings	Overall, I want the user to be able to change some basic game features such as the controls, master volume and background music to suit their needs. However, due to my time frame and limited knowledge in C# I may not be able to create fully customisable controls.	Ninja Arashi
Keyboard Controls	The controls should be set up for keyboard alone on default, so PC and laptop users get the same experience. Aiming won't be necessary if I add missile weapons like bows as it's in 2d. Possible limitations; If I implement a bow of some kind, lack of aiming will mean the character sprite will have to be level with the enemy when shooting as the arrows will fly horizontally.	Interview/ Ninja Arashi
Game music	I will be creating the game music using various software/ composing on a piano and it will make the overall game feel more finished as then the user won't be playing in silence. The time restrictions may make it difficult to compose multiple scores so one main theme will be developed.	Interview/ Feist
Background sounds	These will be played based on ongoing movements and actions; to prevent the game lacking additional details. I will be drawing inspiration from Feist as it's the perfect example of how engaging a game is when the audio and graphics are done perfectly. The only limitation is that I won't be able to add these sounds for every single action and movement, so I will need to prioritise them.	Interview/ Feist
Game over screen	To inform the user that they have reached 0 health and that they have lost any progress on that level.	Interview
Top left shows key stats	These include the total kills and coins collected which will be used at the end of each level to create a score.	Ninja Arashi
Ability to walk, run, jump	The user must be able to move around the level to play, but I must ensure collision detection between the ground and the sprite works well or it wouldn't look right.	n/a
Using Weapons	The user must be able to defend themselves against any enemies seeking to attack them. I will have to investigate how the collision detection will work – I don't want the user to be able to hit a pixel near the enemy and inflict damage and vice versa. I will discuss some weapon types in the additional features; things like adding weapons found on the ground in the levels for instance is a feature I will add should I have time	Ninja Arashi
Weapon selecting	The user should be able to choose which weapons to use based on their collection at the start of every level to make the gameplay more varied throughout.	n/a
Collect coins along the way	The user must be able to collect coins to add to their score and is good for those players who enjoy achieving all challenges the game seeks to offer.	Interview

Clara Bernstrom Girvan   Candidate No: 7009 Centre No: 17511

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Health bar	Instead of implementing lives, I will implement a health bar so that progress on the level is gone once the health reaches zero. This is because each level is solved, and progress saved on a level by level basis. This allows for each level to be completed individually, which is good for users who can't dedicate long amounts of time. I will need to investigate the calculations and variables that affect the health and ensure that when a user takes a direct hit that more damage is inflicted.	Interview
Multiple levels	I will aim to create 8 levels in total of reasonable length; this is realistic in the time frame I have and provides the user with enough gameplay to keep them interested.	Interviews
Multiple heights to walk on	Makes each level more engaging allowing for multiple paths to be taken and therefore different strategies for the user to use. After all, a simple flat terrain will make the game too repetitive. I will need to consider how this will be implemented as I don't want to have just flat platforms. Other limitations are that I don't want the user to be able to stand at a high point and thus avoid all enemies entirely, so either I will place enemy sprites there or make the enemies capable of jumping when targeting the user. This requires more research.	Ninja Arashi
Multiple Enemy classes	Provides some new challenges in the game that means the user will have to devise new strategies to conquer enemies. This ensures that the game doesn't become repetitive which would make people lose interest. However, in the time I have for development it will be hard to create many therefore realistically I will be aiming for 2 or 3 classes each with different weapons and stats. They will be a mix of human style and mythical creatures.	interviews
Scrolling background	Gives the sense that the player is making progress on a journey; I will need to know the file format for the pictures, so I make them big enough.	Feist
Scrolling foreground – Silhouette	By creating the foreground in just silhouettes and darkness, as seen in Ninja Arashi it makes it easier to design the sprites and weapons. It also reduces the violence shown making it suitable for younger audiences. I will need to follow tutorials how to implement this. I will be paying close attention to the graphics of my project as I found Feist to be a beautiful game with quite a simplistic idea; the graphics basically brought it to life. So, I'm hoping that by putting more attention on the visuals, it will make my game look more polished and professional.	Feist/ Ninja Arashi
Camera following user	I want the user to see the sprite being followed through the level rather than showing the whole level at once. There are plenty of unity tutorials out there for this. This allows more detail to be shown at once as the terrain itself will look bigger as you can zoom into various areas.	Ninja Arashi
Enemy sprites targeting user	The enemy sprites will be targeting the user when spotted in a sense they will start to swarm the user if they don't get killed on sight. It adds an additional challenge to the game. I will be using various unity/C# tutorials to achieve this.	n/a
Enemies becoming harder to defeat	The enemies will be becoming harder to defeat, based on what the user already accomplishes; the kills and the damage they sustain whilst engaging in battle. This provides an ongoing challenge instead of a repetitive usage of similar tactics. I will be using various unity/C# tutorials to achieve this.	Interview

Clara Bernstrom Girvan   Candidate No: 7009 Centre No: 17511

Traps/ Obstacles	I will be putting in a few very basic traps and obstacles; namely pits in the ground in which the player dies if they fall to add more challenges to the game.	Ninja Arashi
Time Limit	I am undecided whether it would be good to put in a time limit as I would need to find a time that makes completing the whole level achievable for all across my target audience and so more research/ testing would need to take place, but I think it would be worth it as it adds a challenge.	Interview
Animations	Animations are important to make the game look good; otherwise a single sprite image would move across the screen when moved which would look very odd.	n/a

Additional features

Many of these features are limited by the time frame I have to create this; I have just over 5 months to complete this and I need to be able to balance my work across all subjects. As well as this many feature discussed previously will require research to complete and so lots of my time will be dedicated to that.

Feature	Justification	Research
Extended Narrative	This will make the game more detailed and interesting for the user to pay, but it requires lots of thought to have a well thought out narrative which isn't as important as the main details for the game.	Interview
Improvements on Graphics (particle effects)	I will be creating the best graphics I can in the given time, but should I have leftover time I will be making improvements. Overall, it would give the game a more polished look.	n/a
Background sound effects	These would be extra sounds in the background playing continuously rather than being activated on a condition, they might include natural sounds – wind, birds etc.	Feist
Shop	It would be good to include an area in which players can spend the coins they collect, rather than getting them for a score alone. I'm thinking I could add things like health upgrades which would allow the user to take more damage.	n/a
Campfire – To heal	This idea may be harder to implement, essentially, I want to add at least one campfire to each level, likely in the challenging bits that heals the player if they are close enough to it. This would be the only way at getting any health back in the game. However, it is not an essential feature and so It will be completed should I have the time and knowledge. It would also allow me to add interesting light effects with the graphics.	This idea was from fortnight in which players build a campfire to regenerate health, however I didn't research that game in great detail as this was the only relevant feature.
Weapons	I will be creating additional weapons for the player to use; which will be selected at the start of each level, but this additional feature is surrounding how they are found. I think it would give players more incentive to fully explore each level if they have the possibility of finding additional weapons that would be on the ground as items to collect. Furthermore, I won't be adding any long-ranged weapons that shoot missiles like arrows until basic sword or spear types work as these kinds are not as simple but I certainly think it would be an added bonus.	Interview/
Objects making the terrain more interactive	This includes rocks or sticks that move when the player moves past them – but again, this is more of a finishing touch that isn't necessary to create a good system and in fact it might take more time and energy than it's worth.	Feist

19

Clara Bernstrom Girvan   Candidate No: 7009 Centre No: 17511

Example of how the game would look:
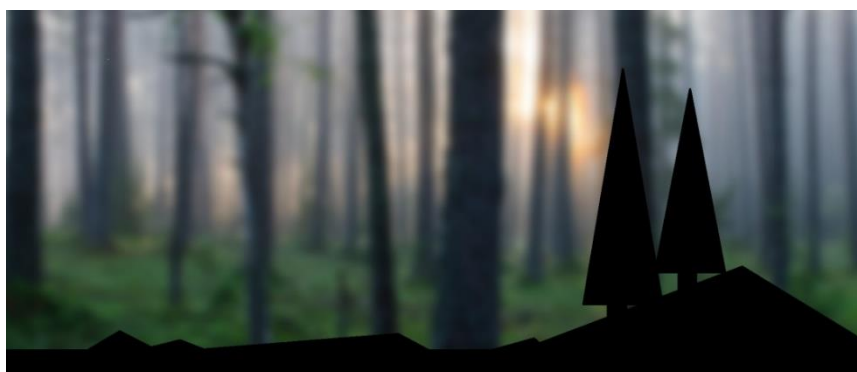
Here is an example is a very simplified version of what the basic game scene might look like. Note, it's a very basic example; for the game itself I will be drawing it all from scratch. It demonstrates the idea of a foreground cast in darkness that simplifies the game design itself.

1.6 Hardware and Software Requirements

For Development: *Taken from the Unity Website and Online posts.*
https://www.quora.com/What-are-the-hardware-specs-required-for-PC-laptop-to-run-Unity-5-game-engine.
https://unity3d.com/unity/system-requirement **: (* as detailed on the unity website – these may vary slightly from my own game in fact, the minimum requirements may be less than written below.)**

The game will be developed in the Unity Game engine; which will require knowledge of C# to write scripts.

Windows 7	I will be using Windows 7 as my operating system and it's the lowest version of windows that unity can run on. *
SSE2 instruction set	Needed to run Unity. *
8GB RAM	Needed to run the Unity game engine, testing the game and more.
12GB Free disk space	This should be enough space to account for all scripts, assets and the unity engine
Visual Studio	Needed to write the scripts in C#
Unity Game Engine	This will be used to make creating the game significantly less difficult; things like physics and collision detection can be implemented through the gui combined with smaller scripts than purely scripts and maths alone. It is also the program where I can combine scripts, assets and multiple game scenes together. I will be writing in C#.
GPU – with DX10 capabilities	Needed to run Unity. *

For running the Game:

Keyboard	Takes in user input for instance to move the in-game movement.
Mouse	This will be accounted for in case the user changes the controls.
Monitor	This is where the user will see the game they're playing.
Speakers	Any background sounds and sound effects need to be played.
2GB RAM	This game won't be particularly demanding and therefore this should be adequate amount of RAM to run the game smoothly.
3GHZ Processor	This processor speed should be enough to smoothly run the game; all movements, calculations and other tasks.
(Disk Space)	250Mb
Windows 7 or iOS 9.0 or higher	The minimum OS to run unity created games. *
Graphics Card with DX10 capabilities	The minimum requirement to run unity created games. *
CPU with SSE2 instruction set support	The minimum requirement to run unity created games. *

Clara Bernstrom Girvan   Candidate No: 7009 Centre No: 17511

For the **additional features**, the success criteria will be developed in the development stage when I am able to decide about whether I am going to include some of the additional features based on the amount of time I have left and the amount of research that will be necessary to create them.

1.7 Success Criteria

I will be breaking these down further in development.
Importance: High importance, moderate importance and low importance.
The focus will be high importance and moderate importance. Low importance criteria would simply be a nice feature to have rather than critical to basic gameplay.

ID	Importance	Criteria	Justification	Supporting Evidence
1		Title Screen needs to be displayed when the game is loaded.	*Introduces the game to the player.*	Ninja Arashi
2		Game over screen to load once the user has run out of lives.	*Informs the user they are out of lives.*	n/a
3		A basic narrative needs to be shown at the start of the level	*Provides the user with an end term goal and introduces them to the world they will be exploring.*	Interview, Ninja Arashi
4		Tutorials in Level 1	*Tells the user what to expect from the game; how to control their sprite and what to look out for. Presented in a graphical way concisely.*	Ninja Arashi
5		Pause Menu opened on (Esc) key.	*The user needs to quickly be able to access this key and for the sake of familiarity the Esc Key will be used. Furthermore, this is needed as I want the pause menu to be accessed via keyboard.*	Ninja Arashi
6		The pause menu temporarily stops the game entirely, the scores, kill and position of the sprites should remain where they are until the user resumes play.	*The user should be able to quit the game for however long the use is away fore and the user shouldn't have to worry that any progress will be lost as this is the same in all other games they will be used to playing.*	n/a
7		Settings to change should include background music and sound effect options including Master volume and on/off.	*Some users may prefer listening to their own music when playing so to prevent the audio playing over; the option to disable it should be present. Furthermore, others may simply not like it and choose to play without any music or sound effects.*	n/a
8		The 'a' key at default should move the sprite left.	*The user needs to be able to move left along the level.*	Interview
9		The 'd' key at default should move the sprite right.	*The user needs to be able to move right along the level.*	Interview
10		The 'w' key at default should make the sprite jump.	*The user has to be able to jump to reach any of the high platforms, avoid enemies and to jump across the pits.*	Interview
11		The 'space' key should allow for any weapons to be used.	*The user must be able to make use of their weapon; otherwise they will not be able to win the game.*	Interview
12		Game music should play on start of level and throughout.	*This should be started as soon as the user selects a level to provide a better atmosphere and experience.*	Interview, Feist
13		Background sounds should be running throughout.	*Adds more depth to the game.*	Interview, Feist, Ninja Arashi
14		The top left of the screen should show key stats; the coins collected and kills	*Provides the user with an idea of how well they are progressing in the game.*	Interview, Ninja Arashi

Clara Bernstrom Girvan   Candidate No: 7009 Centre No: 17511

15		The user of the shift bar should allow the user to run	*Perhaps this could influence the ability to jump; however it mainly is a way the user can get away from enemy swarms.*	Interview
16		The user should be able to select which weapon they are using for the level	*The user will be provided with a sword and a spear; each may have different amounts of damage to inflict but requires different range to get to enemies. Throughout the level the user should be using the same weapon.*	Interview
17		Coins should be at suitable points in the levels	*This should appear random to the user but in reality, each will be placed on purpose in development.*	Ninja Arashi
18		Health bar should be shown at the top of the screen and be kept up to date of the players health	*The player needs to see how much health they have left so they know if they need to be particularly careful. The bar should decrease as soon as a player takes damage.*	Interview, Ninja Arashi
19		A total of 8 levels should be made.	*To provide the user with enough content that would be worth investing time in and that they would find enjoyable. They all should differ so that it's not the same experience.*	Interview
20		There should be several 'platforms' for the player to move across	*Provides multiple pathways through the level and allows for different strategies to be used.*	Ninja Arashi
21		There should be a swordsman class of the enemy sprites who wield significant damage.	*The users should need to use different strategies for the enemy types; this provides more challenges for the user and prevents the game from getting repetitive/ boring.*	Interview, Ninja Arashi
21		There should be a spear class of the enemy sprites who wield less damage but more range.	*Similar to above, it means the user will have to use different methods of fighting to defeat them. This will get particularly interesting when both swordsman and spear enemies are attacking simultaneously.*	Interview, Ninja Arashi
22		The background should scroll alongside the users movements	*Shows that the user is making some progress through the level.*	Feist
23		The foreground should also be moving alongside the users movement by having a camera essentially following the user movement.	*This will match the background for a similar purpose. It also means that I can zoom into a smaller section of the level at one time rather than showing it all at once.*	Feist
23		The sprites and any object, excluding coins should be a simple silhouette.	*This links to the research I did on Feist as I think it's simple but very aesthetic and will reduce time needed to create the assets.*	Feist, Ninja Arashi
24		The enemies should become progressively harder to defeat.	*I'm not sure how this will be done yet, likely calculations that consider the total kills in the time taken alongside any damage taken.*	Interview
25		The enemies should target the user on sight rather than stay stationary.	*This means the user can't simply run away from enemies, instead they will need to kill them to have a better chance of getting away. Overall, it would result in a swarm effect should the user ignore them,*	Interview, Ninja Arashi
26		There should be several traps.	*This provides an extra challenge and makes the game less simple to complete.*	Feist, Ninja Arashi
27		There should be a time limit that ends the game if reached	*Provides the user with an extra challenge; simply another factor that they will need to consider.*	Interview
28		Animations should be seen for each action	*A static sprite moving across the screen would make the game look very basic and boring. Also; it would appear that it's just magically moving across the scene rather than an action being done.*	n/a