**Visual Assets**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **File path** | **Source/s** | **License** | **Location in Image** | **Modifications** |
| Environment/industry\_colored\_tilset.png | <https://opengameart.org/content/minimal-industrial-tiles> | CC0 | Most tiles, excluding some tiles in center and bottom right | Added colour and partially redrew elements |
| Environment/plants\_tileset.png | <https://opengameart.org/content/flowers> | CC0 | First row | Resized, redrawn to fit new size and partly recoloured |
| <https://opengameart.org/content/1-bit-platformer-pack> | CC0 | Second row | Resized, redrawn and recoloured |
| Water/big\_splash\_spritesheet.png...splash\_spritesheet.png...water\_spritesheet.png...water\_bubbly\_spritesheet.png...water\_tileset.png | <https://mkdgames.blogspot.com/2015/05/making-water-with-simple-interactions.html> |  |  | Inspired and based on the artwork and tilesets of this article |

**Audio Assets**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **File Path** | **Source/s** | **License** | **Sourced Parts** | **Modifications** |
| ingame.wav | <https://opengameart.org/content/dark-ambient-loop-13> | CC-By 3.0 / OGA-BY 3.0 | Whole clip |  |
| Effects/death.wav | <https://www.ableton.com/en/> | Royalty-free Extended License |  | Pitch shift, tempo change, and fade out |
| Effects/walk\_loop.wav | <https://opengameart.org/content/42-snow-and-gravel-footsteps> | CC0 |  | Combined together footsteps into loop and applied effects such as noise reduction, low pass, etc. |

**Patrick Bell - Ascendant - Logbook**

|  |  |  |
| --- | --- | --- |
| **Date** | **Work Completed** | **References / Links** |
| 7/03/2021  2 hours | I researched possible game concepts. Starting off with the game mechanics, it would be easiest to write a platforming game due to the inbuilt rectangle collision of Pygame. In researching I considered various inspirations from games I have played. Following the success of [Hollow Knight](https://store.steampowered.com/app/367520/Hollow_Knight/) it seems that metroidvania platformers with tight combat are rising in popularity. I also considered the setting of this possible game, due to low asset requirements it would be easiest to set the game underground, meaning most of the level design can be blank space. For this reason it would be best to create a platformer with tight controls and combat, set underground. | Hollow Knight - Game inspiration - <https://store.steampowered.com/app/367520/Hollow_Knight/>  Pygame - reference - <https://www.pygame.org/docs/> |
| 9/03/2021  1 hour | **Achievements:** Created gantt chart to plan out the project timeline  Began researching and writing up game information, including: Core Concept; Lore and World Building; Genre and Style. In the process of researching this I discovered other possible game inspirations, Dead Cells is a great procedural platformer whose visual style is a good inspiration for the game. Celeste has great tile design and animations to add interest to levels and Super Meat Boy’s tiles are simple to create and largely match the setting. I have decided the game will be set in an abandoned underground factory.  **Challenges:** It is difficult to decide on elements of the game information such as its genre and style so far ahead of the development. To address this challenge lots of research is needed into other games similar to your vision. | Dead Cells - Visual Inspiration - <https://store.steampowered.com/app/588650/Dead_Cells/>  Super Meat Boy - Visual Inspiration - <https://store.steampowered.com/app/40800/Super_Meat_Boy/>  Celeste - Animation and Level Design Inspiration - <https://store.steampowered.com/app/504230/Celeste/> |
| 12/03/2021  1 hour 20 mins | **Achievements:** Created the system development approach justification  I made close reference to the Davis textbook and the classroom slides. I chose the RAD approach for many reasons, key of which are the project's short time frame, limited budget, and client that isn’t the creator (excluding the End User approach).  **Achievements:** Finished creating the story and setting for the game and writing these sections of the game information  Finished creating the story and setting for the game. I am a large reader of dystopian fiction so the story is based around a future without humans and set within an abandoned factory deep underground, drawing inspiration from the game Portal. The story grew as a result of the project's restricted time frame, the underground setting makes level and tile design easier and the post human world makes both enemy design and AI easier. To justify the players and enemies existence long after humans I introduced a magical component to the factory, it used a magical red goo found underground to make robotic workers. Since your character is unlike the enemies, I decided that the main character would be made from the natural world while the enemy would be made from human parts. I called the game “Ascendant” because the character is moving from underground to the surface, since there are no humans on the surface it must be reclaimed by nature, so I made the main character based around a flower explaining their desire to get to the surface.  After asking Mr Dunne to look over my Gantt I made some minor changes with the ordering of the rows. | Davis Textbook - Reference for System Development Approach Justification - <https://drive.google.com/open?id=1o2lUtAzLETV01Pde7qYvXEJnZv2oV2y0&authuser=0> |
| 17/03/2021  1 hour 20 mins | **Achievements:** Finished writing the game information section, adding the game mechanic, audio and visual design and inspiration. Added an animated GIF to the document to show the animation style of Celeste. Celeste’s animation style is very fluid and adds lots of interest to tiles, even if the tiles are simple and repeating, this improves the visuals significantly with little development cost. Polished and corrected elements of task A, including the game information section, system development approach justification, gantt chart and logbook. Added references to the lore inspirations, including Metroid, Castlevania, Portal, Cradle and Brave New World. |  |
| 19/03/2021  1 hour | Final polishing step on part A documentation, checking for any grammar or spelling errors, and verifying all elements of assignment criteria are met. Submitted Part A pdf, unfortunately the Celeste animated GIF didn’t play in the exported pdf. |  |
| 2/04/2021  3 hours | **Achievements:** Finished the first draft of the structure chart using Diagrams.net and Mr Dunne’s provided symbols, consulting the Davis textbook to ensure correct format and symbol usage.  **Challenges:** It is difficult to create the chart without having written the program because it makes you think ahead, anticipating the structure of the program and the flow of data.  Did some searching for visual assets, mainly searching on <https://opengameart.org> which is great because all the assets are creative commons. I found [this asset](https://opengameart.org/content/minimal-industrial-tiles) which fits the aesthetic of an underground factory. The sprite sheet includes tanks and pipes which will be useful for showing the “magic goo” travelling throughout the factory. The asset is just silhouettes so it doesn’t communicate the goo or setting properly so some color is definitely required.   |  | | --- | |  | | *An example scene for the visual asset from opengameart.org* | | Davis Textbook - Reference for structure chart - <https://drive.google.com/open?id=1o2lUtAzLETV01Pde7qYvXEJnZv2oV2y0&authuser=0>  Structure Chart Symbols - <https://classroom.google.com/u/0/c/MTYzNzM0NTQ1Mzk0/m/Mjk4MDE3NTg3MTg4/details>  Visual Asset - <https://opengameart.org/content/minimal-industrial-tiles> |
| 5/04/2021  5 hours | **Achievements:** Coloured the underground factory visual assets by adding in greenery and red goo variants of each tile. Furthermore since the setting is underground some edge tiles/brick tiles are required so I drew these based on my game inspirations, mainly Super Meat Boy and Celeste. I just made the colour palette up as I went which was very easy with the pixel art drawing tool I used: Aseprite because it allows colours to be indexed into a palette which can be edited on the fly.     |  |  | | --- | --- | |  |  | | *Newly designed underground tiles* | *Celeste edge tiles used as inspiration* | |  |
| 6/04/2021  2 hours | **Achievements:** Finished work on the structure chart.  After having coloured the tiles I wanted to get a feel for their usage in a level. Using a tilemap editor, I chose [Tiled](https://www.mapeditor.org/) because of its wide toolset and standardised file formats, I created some small demo levels to see how everything looked and afterwards made some tweaks. The industrial tanks and other large structures were looking fairly bland so a vine plant and purple flowers added some interest. Furthermore by increasing the contamination of red goo and erosion on metal objects they became more interesting, especially adding rust to the wires and bars.   |  |  | | --- | --- | |  | *One of the example levels created to test out the design, after tweaking to add more interest* |   Since the industrial aesthetic is fairly dark and dominated by reds I wanted to add some contrasting levels so I found a [plant tileset](https://opengameart.org/content/flowers) on opengameart.org which I modified slightly and added some plants to based on another [Kenney tileset](https://opengameart.org/content/1-bit-platformer-pack). These plants and a different (green) background contrasts well with the other levels.   |  |  | | --- | --- | |  | *Nature based level with plants, vines and partially earthen walls* | | Aseprite - Reference Page - <https://www.aseprite.org/quickref/>  Plant Tileset which was modified - <https://opengameart.org/content/flowers>  Kenney tileset which only one or two tiles were taken from - <https://opengameart.org/content/1-bit-platformer-pack> |
| 8/04/2021  4 hours | Began work on the title theme drawing inspiration from both Hollow Knights theme and the music of C418 (composer of the Minecraft soundtrack). In this vein I think the piece would be best if it was a quieter, more ambient and atmospheric piece with a simple piano melody. I have some experience with the DAW (Digital Audio Workstation) Ableton, so I used it to start off the ambient track with some chords. On <https://opengameart.org> I found an ambient piece which I thought fit well with the mood of the setting. Here is the [Ambient Loop](https://opengameart.org/content/dark-ambient-loop-13).  **Challenges:** I am pretty much new to using Ableton so I found their support page useful for any questions I had about how to use the program. | Ambient Background Audio - opengameart.org - <https://opengameart.org/content/dark-ambient-loop-13>  Ableton Support Page - <https://forum.ableton.com/> |
| 11/04/2021  5 hours | **Achievements:** Recorded and edited all the sound effects for the game.  I created a list of sound effects required for the game, these being: walk, attack, damage, death, falling, jump, landing hard, landing softly, landing in water, and walking in water. I brainstormed some ideas for ways to create these sound effects, eg. objects and sounds to record. To create the damage sounds I broke twigs and barks into the microphone. To create an attack sound I used a knife running against a sharpener and a rock. To create the death sound effect I edited one of Ableton’s sound effects. To create the falling and jumping sounds I moved a jacket and crinkled it. To create the landing sounds I dropped rocks on the jacket at different heights. For both water sounds I splashed water in my sink. Each of these raw clips required editing to select the best sounds, remove background noise, normalise the audio, remove unwanted frequencies (such as applying a low pass filter to the knife sound), and add appropriate reverb.  For the walking loop I found various sound effects on opengameart.org the best of which was [this one](https://opengameart.org/content/42-snow-and-gravel-footsteps) which consists of individual clips of footsteps in the snow. To create an appropriate loop I edited the clips together and applied noise reduction to the sound of snow, allowing the effect to better suit the underground setting.  To perform all the audio editing I used audacity. | Footstep sounds - <https://opengameart.org/content/42-snow-and-gravel-footsteps>  Audacity - Free Audio Editing Software - <https://www.audacityteam.org/> |
| 13/04/2021  3 hours | **Achievements:** Finished creating the title theme, brought the theme together by adding in some sound effects and percussive ambiance. |  |
| 15/04/2021  5 hours | **Achievements:** Created enemy and player sprite sheets using Aseprite. I was inspired to create the player and first enemy by the player sprites of the game [Nidhogg](https://store.steampowered.com/app/94400/Nidhogg/), using a simpler, more blocky style than the background to distinguish them. Furthermore by using a simple blue and black color scheme for the player it has high contrast with the background and enemies, who have a red and black color scheme. The first enemy is intended as a patrolling enemy, making its more human design logical. In comparison the second enemy is intended to be jumped or bounced off, so I based it off the “Jump Crystals” of Celeste, making a red diamond which reforms after it is bounced off of.   |  |  | | --- | --- | |  |  | | *“Jump Crystals” from Celeste used as inspiration* | *Enemy 2 Animation* | | Nidhogg - Visual Inspiration for Player and Enemy1 - <https://store.steampowered.com/app/94400/Nidhogg/> |
| 16/04/2021  5 hours | **Achievements:** Created Gui visual assets and screen designs for each of the menu screens. The visual assets consist of an animated health bar, arrow, save icon, save animation, background and game logo. For the health bar I was inspired by the liquid “Soul” meter of Hollow Knight, creating a bulbous area of sloshing liquid, with a right facing bar which is changed in length by code. For the save animation I was partially inspired by the save animation of celeste, utilising the conventional symbol of a floppy disk to better communicate to audiences. In designing the menu screens I was inspired by Super Meat Boys simple plain text style and continued the pixel art visuals. Using Adobe illustrator I quickly linked together the screen designs with arrows to show the flow between menus. |  |
| 17/04/2021  4 hours | **Achievements:** Added extra environmental tiles and began programming the rendering.  After creating demo levels I decided some more variety was needed in the game and more animated tiles. I found [this tutorial](https://mkdgames.blogspot.com/2015/05/making-water-with-simple-interactions.html) which while not very useful for programming, since it is based around unity, had great visual assets for water tiles and splashes. After changing the colour scheme and redrawing the bubbles and splashes I had a new animated environmental element. After creating these splashes I realised it would be great to add dust trails and puffs to the players movements and landings. After doing some research online and looking at other pixel art games I amalgamated these designs to draw two dust animations in Aseprite.     |  |  | | --- | --- | |  | | | *Dust and splash animations* | |   After creating these animations I got started on rendering sprite sheet animations with pygame. After doing some research I found this [code](https://www.pygame.org/wiki/Spritesheet) snippet which loads an image from a file, converts it to be efficiently rendered and then splits it into frames. Based on this code I created two classes: AnimatedSprite and ImageSprite which handle rendering and advancing frames in animations. The AnimatedSprite loads a json file which describes the various animations (eg. x, y loc, frame size, num frames, time) and an image file path which the class loads into separate frame arrays for each animation. When an animation is pushed the correct image buffer is set and playback is started. The class is controlled by the render and update\_animation functions which increment the frame when appropriate. Overall this works well and is fairly efficient, but to improve performance I may have to implement a dirty rectangle system rather than redrawing the whole screen every frame. | Mkdgames - 2d animated water tiles tutorial - <https://mkdgames.blogspot.com/2015/05/making-water-with-simple-interactions.html> |
| 18/04/2021  4 hours | **Achievements:** Programmed rectangle collision algorithm for handling collision between entities and a level.  The level object contains an image background which is rendered and a precomputed array of rectangular colliders. Spawning an AnimatedSprite to represent the player we apply gravity by adding some amount to the object's velocity every frame, causing it to fall through the level. By giving the animated sprite its own custom rectangle collider we use pygames function pygame.Rect.colliderect to test collision. If the player is colliding we reset its velocity to zero and push it out of the rectangle it collided with. Comparing the top and bottom of each collider and sides of colliders then choose the smaller transformation. Reposition the character by this transformation.  **Challenges:** Coming up with an algorithm was fairly difficult and while my initial algorithm worked it didn’t set the velocity to zero so eventually the player would build up enough velocity to pass through the ground. To ensure all the colliders were correctly positioned I need to make a small debug overlay which could be toggled with the tab key. |  |
| 19/04/2021  1 hour | **Achievements:** Organised and put together all the assets for the Part B submission. Wrote up the sources for all the creative commons assets.  **Challenges:** Yesterday I created a collision algorithm but this relies on a precomputed list of rectangular colliders for the environment. Initially to combat this I wrote a script in Python which loaded an image file and with a custom algorithm broke it into efficiently sized rectangles whose coordinates and sizes were output to a json file. This worked but was very slow for even slightly large levels, especially for levels with large blank spaces, since it has to loop through every pixel in these regions. For this reason I rewrote the script in C++ using [this bitmap library](https://github.com/ArashPartow/bitmap) to load the image, leading to almost instantaneous collider generation. Since this is precomputed and isn’t part of the game the language restriction to Python doesn’t apply. | Open source Bitmap Library - <https://github.com/ArashPartow/bitmap> |
| 21/04/2021  40 mins | After consulting with Mr Dunne about my structure chart I added data parameters coming back from subroutines if changes were made to the data which want to be carried on. Furthermore I added a save routine and a decision for handling not updating enemies and players when paused. |  |
| 22/04/2021  1 hour 40 mins | Further refinement of the structure chart by positioning symbols more properly. Polished and checked logbook for errors, organised file structure of submission, created zip, and submitted. |  |

*Logbook live link:* [*https://docs.google.com/document/d/1kMsWEZAxsdRCYaovwBim9GE-wXJ-SpDo\_yOekvf1yDM/edit?usp=sharing*](https://docs.google.com/document/d/1kMsWEZAxsdRCYaovwBim9GE-wXJ-SpDo_yOekvf1yDM/edit?usp=sharing)