2D Game Design Using GameMaker

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Introduction

Recent years have seen corporate greed actively destroy the AAA game industry, which has been a significant motivator for developers to move to the independent game development (Indie) space.

With the availability of advanced game development tools, 2024 has been an exceptional year for Indie games. This project will take advantage of one such tool, creating an enjoyable and fully functional 2D game using **GameMaker**.

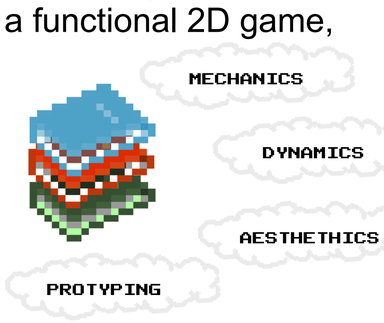
Aim

This project aims to develop a 2D game with procedurally generated terrain and engaging gameplay mechanics. Using the development software GameMaker, a fully functional game will be presented, as well as a functional gaming controller that meets the player's needs and adheres to technical constraints. In addition, the game will be made with sufficient complexity by incorporating advanced game mechanics, dynamics and an aesthetically impressive display.

Ample opportunity will be provided for testing and evaluation of the game, ensuring that the expected deliverables are achieved.

Literature

Reviewing relevant **literature** required to develop a functional 2D game,



***Main points** identified in the Literature Review:*

- *Mechanics*
- *Dynamics*
- *Aesthetics*
- *Meaningful play*
- *Prototyping*
- *GameMaker as a development platform*

Requirements

Breaking down the **user requirements**

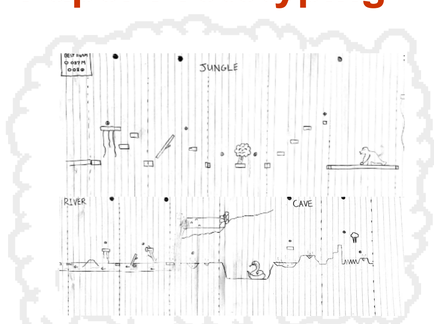
User Requirement	Explanation
SR1	Must be made with GameMaker
SR2	Create a fun 2D game
SR3	Must be made with sufficient game complexity that there is enough problem solving required.
SR4	The 2D game must be functional
SR5	Must be tested and evaluated

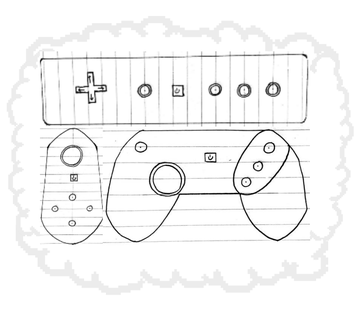
Creating **acceptance test procedures**.

Test	Explanation
ATP1	The game is developed using GameMaker Studio 2.
ATP2	Successful implementation of procedural generation.
ATP3	The difficulty rating of the game is sufficient.
ATP4	Players find the game enjoyable
ATP5	Players consider the game to be aesthetically pleasing with a coherent art style.
ATP6	Code runs smoothly without bugs or lag.
ATP7	The game controller has the functionality to play the game.
ATP8	There is a large enough sample size such that adequate play-testing is conducted.

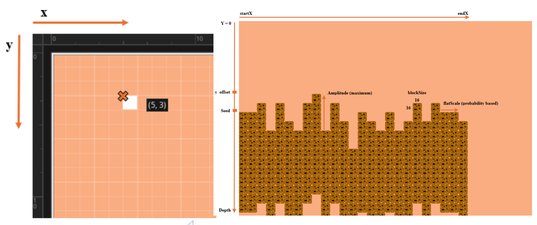
The design and simulation is aimed at meeting each user requirement of the project.

Paper Prototyping

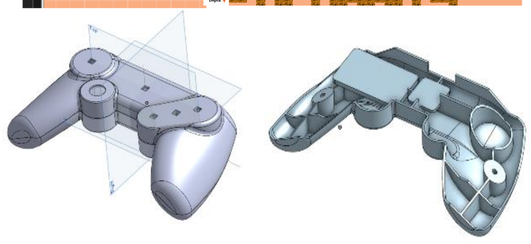




Design and Modelling



Using GameMaker's coordinate system to place objects with a function that procedurally generates terrain.

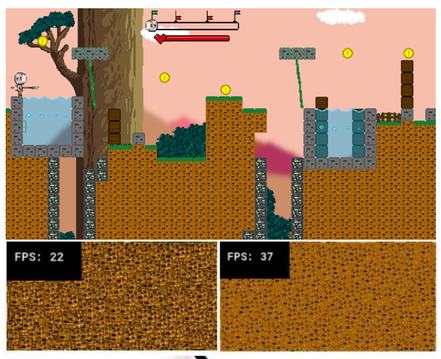


Combines the 'old-school' 2D platformer experience with a modern and familiar style of console experience.

The game's design incorporates complex game **mechanics**, including movement and procedural terrain generation. **Dynamics** are achieved through a collection of mechanics, and how the player responds. The choice of art is made to be coherent throughout the game. With a well-crafted GUI, an **aesthetically** pleasing display is achieved.

The **controller** explores component selection, the choice of microcontroller, modelling, prototyping, as well as the final design used for the project.

Simulation and Prototyping



Through many iterations of simulations and prototypes, the designs of the project can be refined.

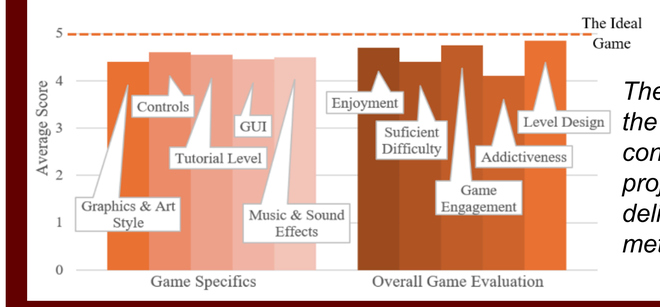
Optimisation within the code improves the system performance.

The designs can be finalised, ensuring that user-experience is prioritised, as well as the projects requirements are met.

Results

By conducting a participant-based play test and questionnaire, the quality of the designs are verified, using the average score obtained from each question as a quantifiable metric.

Play-testing questionnaire specifically targeted at verifying the acceptance test procedures.



The results from the play-test confirm that the project's deliverables are met.

Conclusion

Through analysing the data, the project's performance is reviewed. All acceptance test procedures are met, and the projects deliverables are put forward. Valuable recommendations from the play-testing questionnaire allow this project to be further developed in the hope of successfully launching to game hosting sites, mobile Android devices and the App Store.

Online Link To Game:

https://gx.games/games/ublc23/apoco-playtest-version-/tracks/234c3db2-351c-4571-9b28-00ba1450d87a/

Only available on computer and laptop devices.

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