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| University of Pittsburgh at Bradford |
| Game Development Final |
| Life-Spinner |

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**Life-Spinner: A Game of Life**

This paper will discuss the development process of “Life-Spinner”, a Unity 2D based game developed by myself, Logan White, a third year at the University of Pittsburgh at Bradford (ThyLaw, 2020b). Life-Spinner was uploaded to the online software hosting service GitHub on November 1st, 2020, and was last updated on November 13th, 2020 (ThyLaw, 2020). Life-Spinner is based on a smaller project I created named “Cash-Spinner” on the 16th of October, 2020 (ThyLaw, 2020a).

Life-Spinner is a two-dimensional game featuring a spinner that produces different events based on what color the needle lands on when it is finished spinning. The events within the game can increase or decrease the player’s money, increase or decrease the player’s “pay per turn”, or can have other effects such as getting the player married or divorced. The goal of the game is to get to age 60 without going bankrupt, or having negative money. The player’s age starts as age 18, and is incremented every time the wheel is spun. If the player reaches age 60, which would be retirement, or becomes bankrupt, the “sceneMainGame” will be replaced by “sceneBankruptcy” or “sceneGameOver”, which will give the player the option to return back to the main menu, restart, or exit the game. The goal of this game is to represent the unpredictable nature of modern life and understand some aspects of finance, such as to not buy a yacht when you get a raise as it could lead to financial trouble.

The Unity Engine was chosen for this project because of the vast amount of resources available for building games within the engine, as well as prior experience with the engine by developing projects from the book “Introduction to game design, prototyping, and development: From concept to playable game with Unity and C#” (Bond, 2018). An example of the resources Unity has available comes from the Unity asset store, and Unity’s free online courses from Unity Learn. Both of these resources were instrumental in the development of Life-Spinner.

When the development for Life-Spinner first began, I found myself struggling with scripting in Unity, even though I have had some experience with programming in C#. Thanks to Unity Learn, I found the course “Unity C# Survival Guide”, a 23-hour long course that teaches C# and scripting in Unity (Weinberger, 2019). One of my goals after developing Cash-Spinner was to break up the code into different scripts to make the code cleaner, and this course helped with my biggest issue when doing that: referencing Game Objects and their components.

An example of this is when I wanted to reference variables from my “newSpinnerScript” that was attached to the Game Object “Spinner”. An example of the code I used is as followed: “GameObject.Find("Spinner").GetComponent<newSpinnerScript>().isRewarded;”. Another important lesson I learned when referencing variables in other scripts was to remember that even if you update the variable that is assigned that reference, it will not be updated in the original script.

Another challenge I had to tackle with the scripting came from using global variables. Since Life-Spinner utilizes multiple scenes, information cannot be carried over if the scene switches. This caused the need for a global variable, something in which I had not worked with previously. In order to transfer the name entered on the scene “sceneStart” into a text element within the scene “sceneMainGame”, I had created a script called “NameScript” that had public static voids to set and get the public string “UserName”. This script allowed for the variable to be referenced from every scene in the game.

One major feature of Life-Spinner is the spinner itself. In order to get the sprite to spin, I created function that utilized transform.Rotate() and passed in a random float for the “z” axis as “rotationalSpeed”. The spinner would instantly start slowing down by a multiplier of a random float from .98 to .99, and once the spinner reached a rotationalSpeed of 0.1, the rotationalSpeed would be set to 0, causing the sprite to stop spinning. To be able to reward the player, I utilized the final angle of the spinner’s z axis when it stopped rotating. The spinner is then broken down into 12 sections of ranges of 30, for example, 0 to 30, 30 to 60, 90 to 120, etc., each representing the color of the spinner at that location. Various if statements then determined the type of events that would trigger, such as red, green, blue, and gold, and then more if statements determined what specific event would trigger by utilizing random integers.

Another major feature of the game is the dialogue system. I began developing the dialogue system myself using helpful videos from resources such as the YouTube channel “Brackeys” (Brackeys, 2020), I found that creating an intuitive dialogue system that was satisfactory would take a long time to create. Instead, I utilized Unity’s Asset Store and found a free asset named “Dialogue Editor” by Runia Dev that offered a dynamic dialogue system that suited the game perfectly and was efficient to work with (Dev, 2020). The asset created a dialogue editor that allowed for drag and drop mechanics to create a functional dynamic conversation. Other assets I used within the project are sounds and songs that were also listed on the Unity Asset Store.

In conclusion, developing Life-Spinner was a fun and engaging experience. Due to time constraints, many features I originally wanted within the game had to be cut for the first release, however, I plan to come back and add those features to Life-Spinner and develop the game to fit my vision. Some features I would like to include would be a bank system, a player statistics menu, and a stock market feature. I, at the very least, would like to implement more scenarios to give the game some more “replayability”. To improve the project, I would redo the spinner system to try utilizing ray casting to determine the color of the underlying spinner when the spinner stops, and then reward the player after. Overall, the development of Life-Spinner has made me confident in my ability to develop simple games with Unity, and I hope to create more as time goes on.

# References

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