Maad City

By Christopher Hamilton

Elevator Pitch

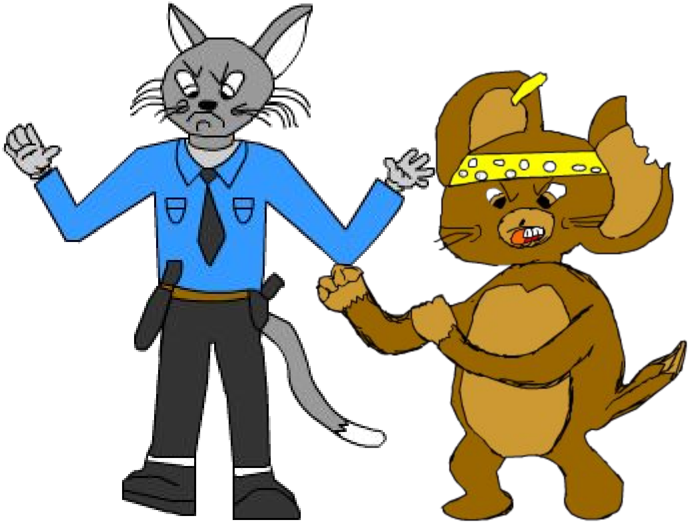
A 2d tower defence game that is basically taking the concept of the game cops and robbers. Tower defense is a strategy video game where the goal is to defend the goal territories or possessions by obstructing the enemy attackers, usually achieved by placing defensive structures on or along their path of attack. Cops and robbers is a tag game that has two teams, robbers and cops, the cops try to catch the robbers. The goal is to defend the bank from the robbers by building police stations that block shoot and stall the robbers.

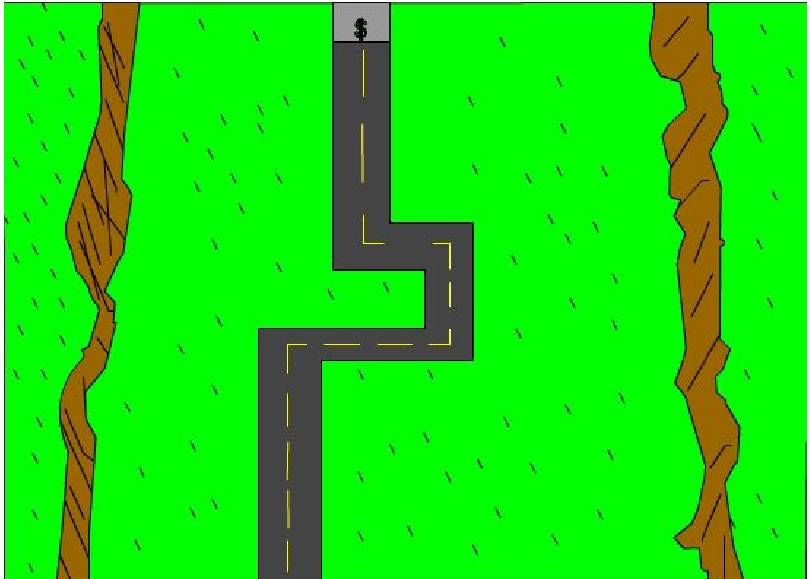
Core mechanics

- Player can place towers that can damage or kill enemy attackers before reaching the getaway car .
- Ability to upgrade towers.
- Currency to purchase upgrades over time and experience points, which is earned by defeating an attacking unit.
- Each wave usually has a set number and types of enemies.
- Player character is controlled by keypad.
- Mouse button is to shoot enemies.
- If enemy reaches getaway car player character loses 1 health.
- When character health goes to 1 you lose.

Design

Maad City’s design was based on Kingdom Rush ,Cops and Robbers(tag game) and Tom and Jerry.
Kingdom rush is what inspired me to make a 2d tower defence game. It has a very simplistic UI that is easy to understand without much explanation which is something i want to implement in my game. Tom and Jerry inspired the characters in the game that will represent the player character and the Enemy units. I designed the first level of the game based on a fictional town of Maad City based on a bank area. The road was meant to be easy to understand and develop a strategy to beat the enemies traveling down the road.





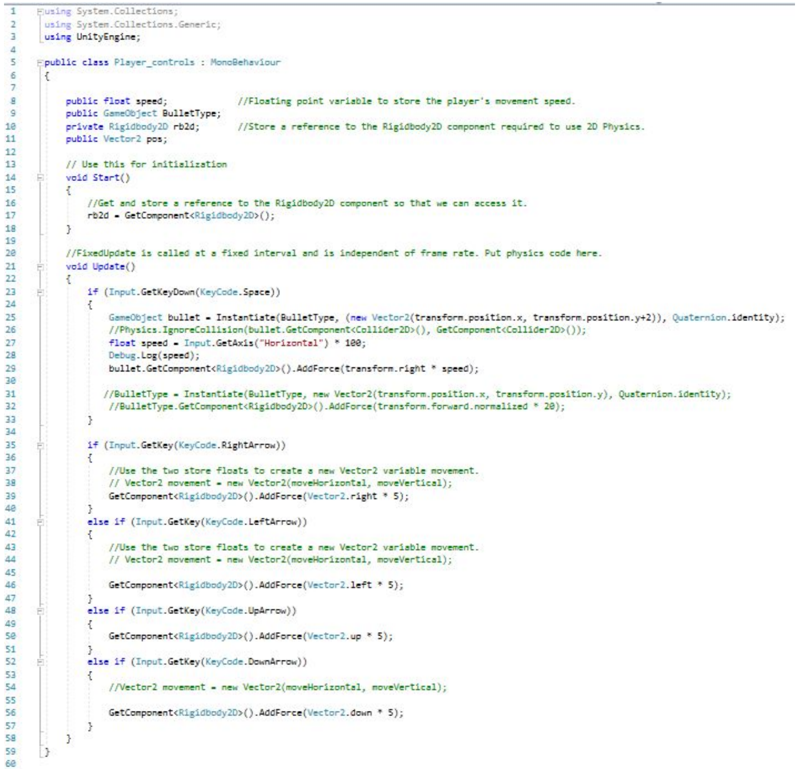
Development

I created player script controls that move and shoot

I also wanted to create a way to finish a

Check point system for the enemy units to

move down the guided path.



```
using System.Collections;
using System.Collections.Generic;
using UnityEngine;

public class Player_controls : MonoBehaviour
{

    public float speed;             //Floating point variable to store the player's movement speed.
    public GameObject BulletType;
    private Rigidbody2D rb2d;       //Store a reference to the Rigidbody2D component required to use 2D Physics.
    public Vector2 pos;

    // Use this for initialization
    void Start()
    {
        //Get and store a reference to the Rigidbody2D component so that we can access it.
        rb2d = GetComponent<Rigidbody2D>();
    }

    //FixedUpdate is called at a fixed interval and is independent of frame rate. Put physics code here.
    void Update()
    {
        if (Input.GetKeyDown(KeyCode.Space))
        {
            GameObject bullet = Instantiate(BulletType, (new Vector2(transform.position.x, transform.position.y+2)), Quaternion.identity);
            //Physics.IgnoreCollision(bullet.GetComponent<Collider2D>(), GetComponent<Collider2D>());
            float speed = Input.GetAxis("Horizontal") * 100;
            Debug.Log(speed);
            bullet.GetComponent<Rigidbody2D>().AddForce(transform.right * speed);

           //BulletType = Instantiate(BulletType, new Vector2(transform.position.x, transform.position.y), Quaternion.identity);
            //BulletType.GetComponent<Rigidbody2D>().AddForce(transform.forward.normalized * 20);
        }

        if (Input.GetKey(KeyCode.RightArrow))
        {
            //Use the two store floats to create a new Vector2 variable movement.
            // Vector2 movement = new Vector2(moveHorizontal, moveVertical);
            GetComponent<Rigidbody2D>().AddForce(Vector2.right * 5);
        }
        else if (Input.GetKey(KeyCode.LeftArrow))
        {
            //Use the two store floats to create a new Vector2 variable movement.
            // Vector2 movement = new Vector2(moveHorizontal, moveVertical);

            GetComponent<Rigidbody2D>().AddForce(Vector2.left * 5);
        }
        else if (Input.GetKey(KeyCode.UpArrow))
        {
            GetComponent<Rigidbody2D>().AddForce(Vector2.up * 5);
        }
        else if (Input.GetKey(KeyCode.DownArrow))
        {
            //Vector2 movement = new Vector2(moveHorizontal, moveVertical);

            GetComponent<Rigidbody2D>().AddForce(Vector2.down * 5);
        }
    }
}

```

Testing

I tested the player control of the cop which had many issues like, not walking at all.Falling of the game map. After i got it to walk it would glide infinitely. After i fixed this issue i tried to get him to shoot his gun but the asset for his gun was bugged and would not load in the game at all, so i took it out. The bullet size was to big and would collide with the cop which caused it move constantly to the left. The bullet would not hit the enemy and was too slow so I increased the speed and decreased the size of the bullet and oriented it to shoot slightly above the cop. Which creates the desired effect without the weird interaction while shooting.

Challenges

What I learned when testing the game is the difficulty of creating code which could have been less difficult if i asked for help from the very beginning for the coding of the game. Utilizing Unity after i was finished with assets was not the right approach because i should have been gained an understanding of the fundamentals of unity first and getting a better understanding of C#.

Insights

I learned that i could have done this project better with a little bit more organization with time and accessing my skills with the project at hand. I need to talk to more people with the skills in coding designing so i could be guided in a way that would have shown me the restraints that i had, specifically time. If i had managed time correctly i could have had a more well developed game.

Next Steps

I need to finish the pause button which gives you the start menu, this menu gives you selection of start, options and exit. The towers need to be implemented in away that I can drag and drop them from the lower left side of the map in a little icon that represents the tower you wish to select. I need to be able to fix the spawn function because currently there is only one enemy unit. I need to finish the health bar wave, count bar and currency bar scripts and hopefully finish the other levels. I would add sound and music to the game.