Game Version 1

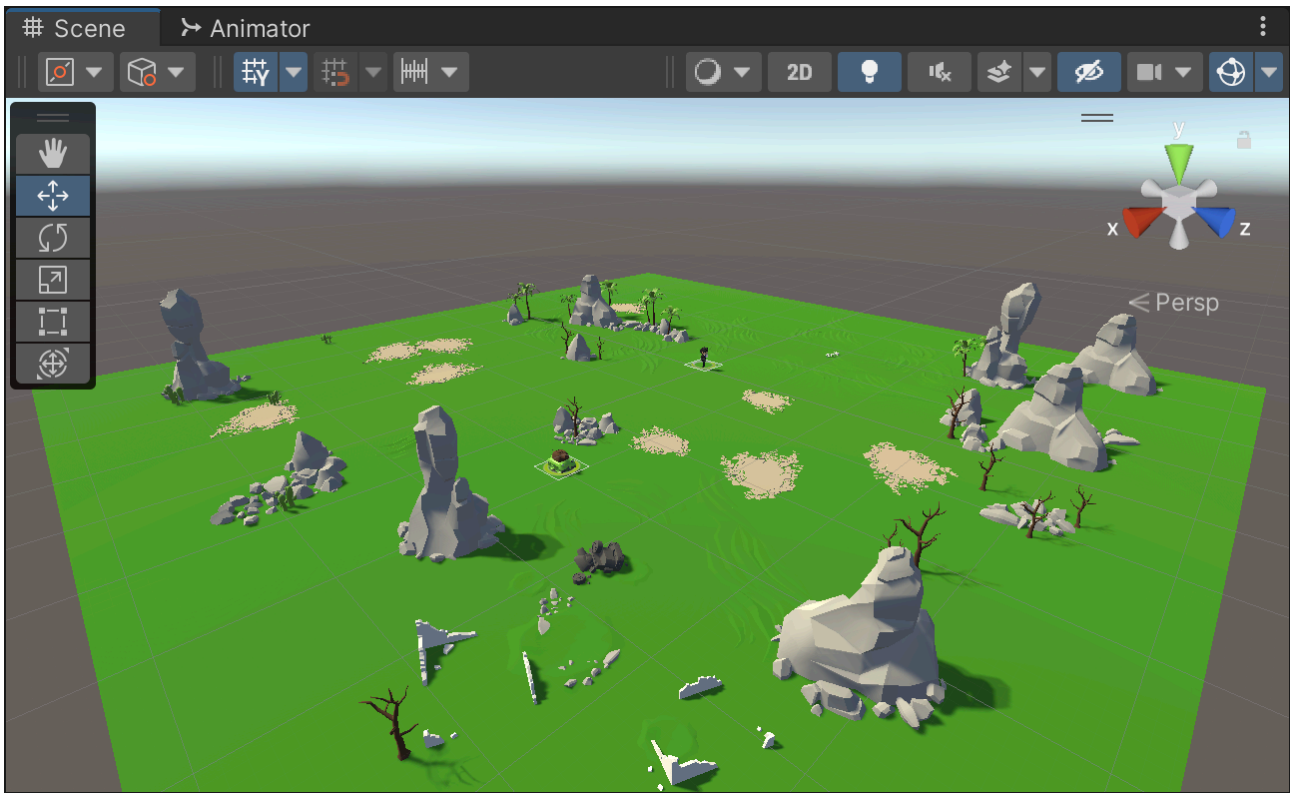
Idea: The initial attempt was to make a simple game. I want to at least make sure it's a playable game. As a single-player game that can be played, I think you need at least one game object and one enemy. With this in mind, I made the first attempt.

As you can see in the image below, this is a very simple scenario. The scene consists of terrain, a game object, and his enemies. Fortunately, although this version is very simple, it can be played.

In short, in version 1 I decided on the player character, enemies, how the player would attack with an axe and how the tank would fire bullets. Including the design of the circle health bar in the final game version. This is a prototype of the final version of my game.

Challenge: Probably the biggest challenge in this section is the code. Although I have learned a lot of code knowledge in CCI, there are still many problems when I use it in practice, so I spent some time debugging. The result is a very simple game screen like this.

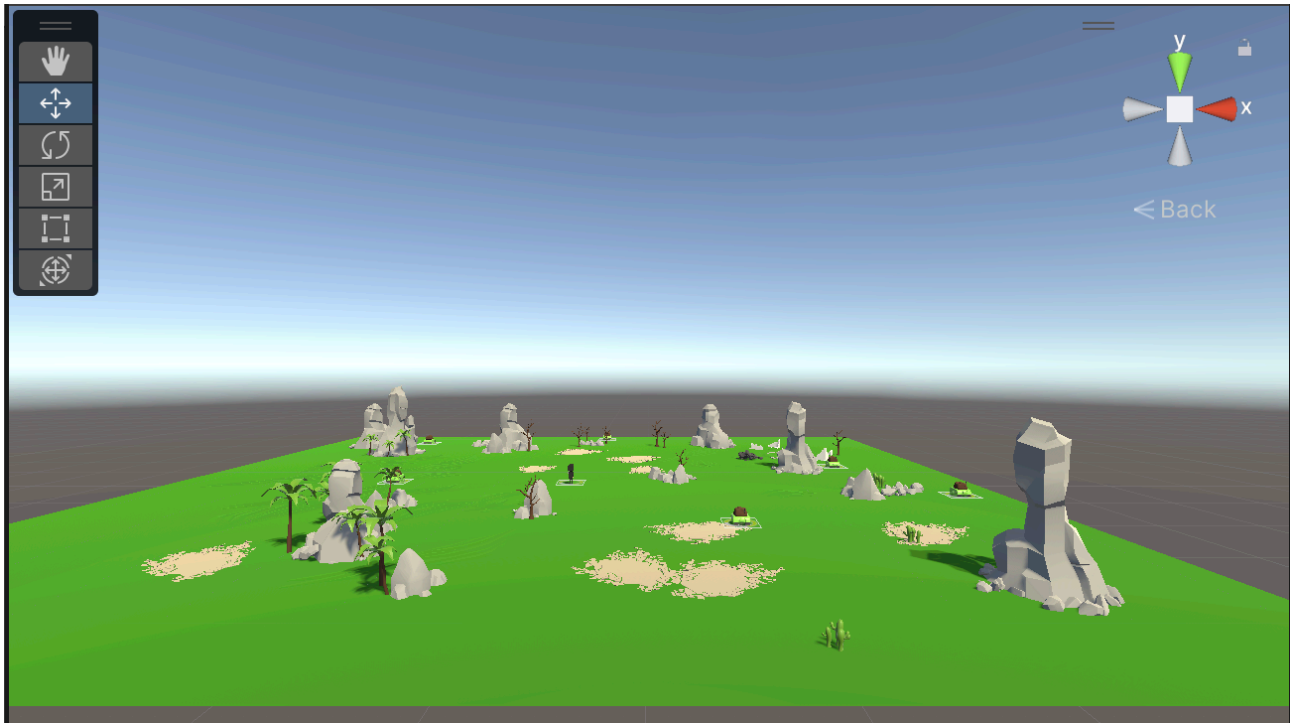
At first, I was satisfied that it could be done like this, at least it means that it is a good start.



Game Version 2

Idea: After doing the initial attempts, I thought an enemy might be a little bored. Because defeating an enemy is still relatively simple, this may make the game end quickly. So in the second version I did, I tried to increase the number of enemies. I turned one tank into six tanks. I think this will greatly improve the playability. I also tried to change the speed at which the player fired the axe and changed the player's health. Let the player's health change more, so that the player can resist the attack of 6 enemies.

Challenge: This step was easy, I just had to create a few more enemies and adjust the character Settings.



Game Version 3

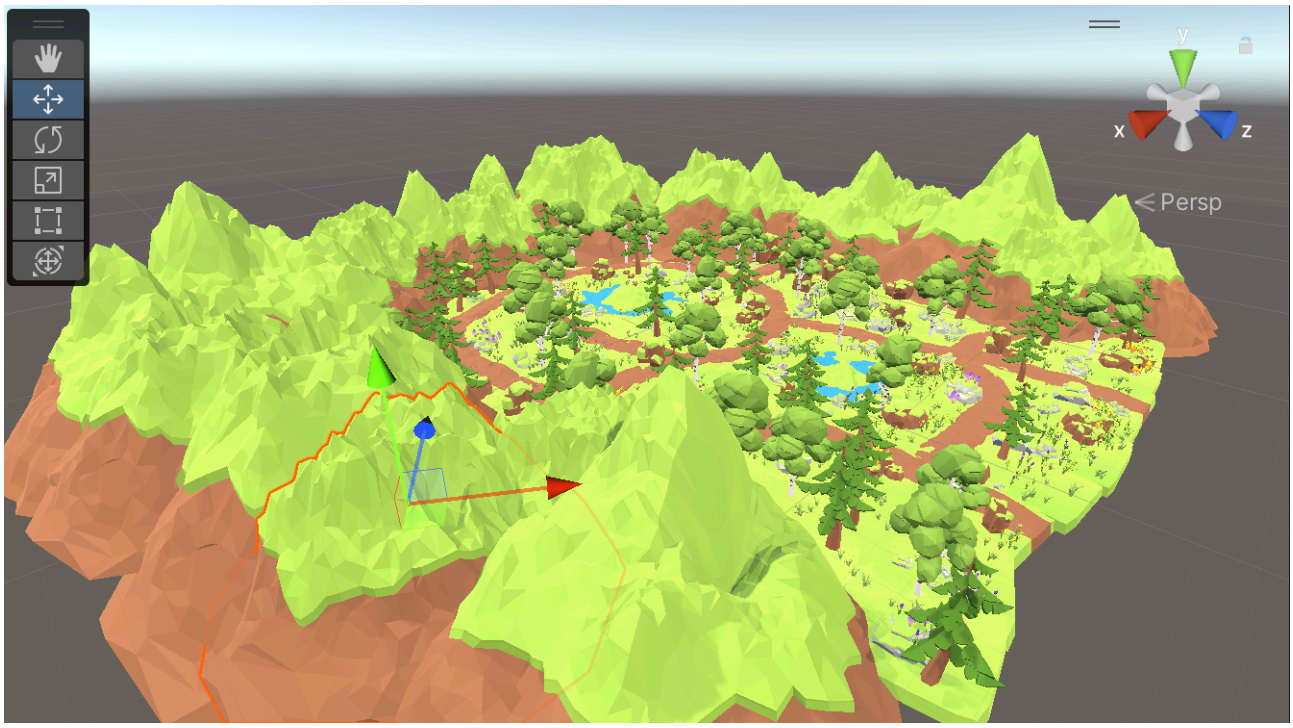
Idea: After working on the last version, I found the terrain to be a relatively easy part. Because there is no shelter in the terrain at the beginning, the overall appearance is very empty and looks very simple. So in this version, I tried to make the terrain a little more complex. I added a lot of mountains, lakes, and trees as well as small flowers and grass as decorations.

It's worth mentioning that in this section, I used large rocks and mountains as obstacles to get in the way of the player, but I used grass and flowers as decorations. This means players can walk right through the small flowers and grass.

The reason for this is that after trying it a few times, I realized that if everything on the terrain is presented as an obstacle, the running game character will always be blocked. To be honest, the game experience was not very good, so I made improvements.

Challenge: One of the challenges I remember here was when I imported the model into Unity and it turned fuchsia, which took me some time to adjust. I looked up some online solutions and successfully imported the model into them.

Another problem is the placement of the scene, I need to move different objects to make everything on the scene more reasonable. Characters can also run normally.


y
x
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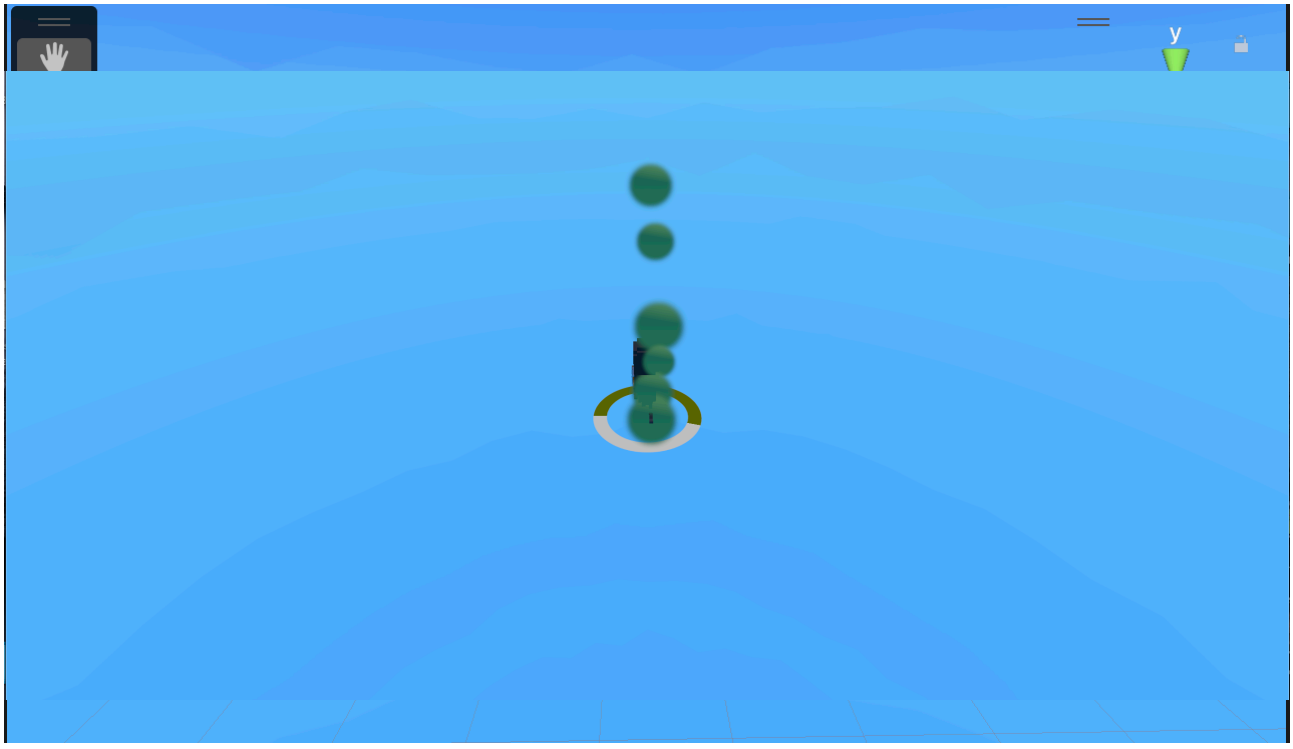
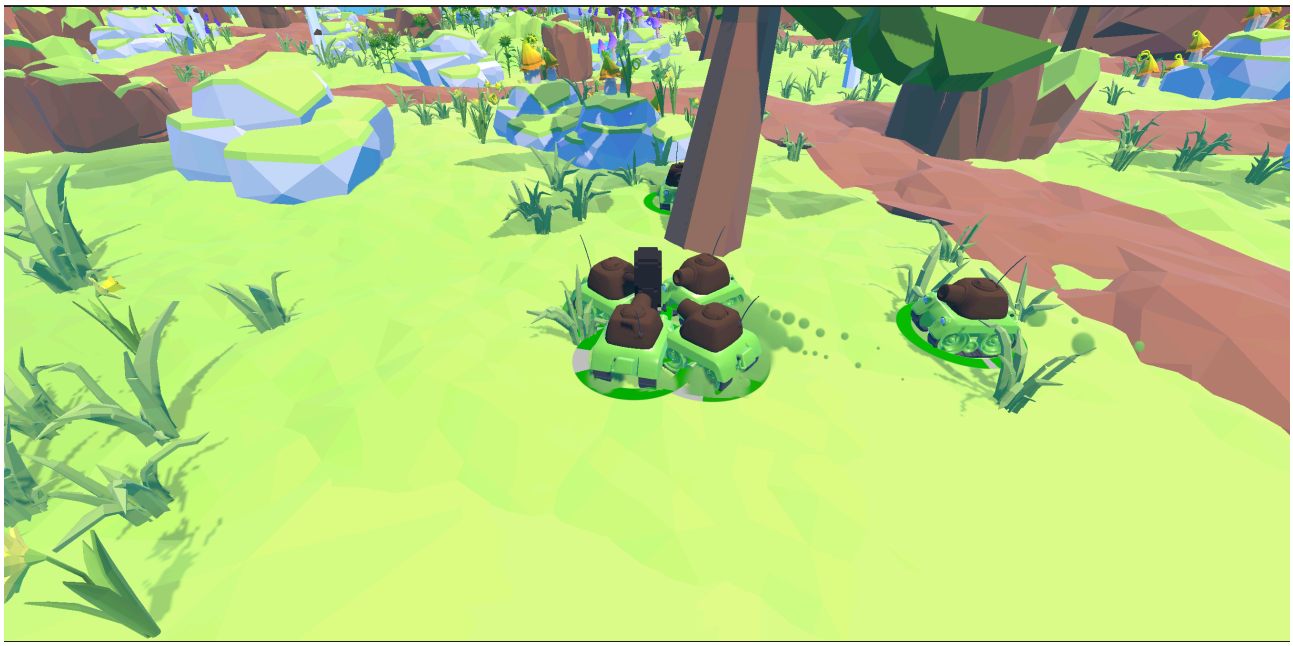
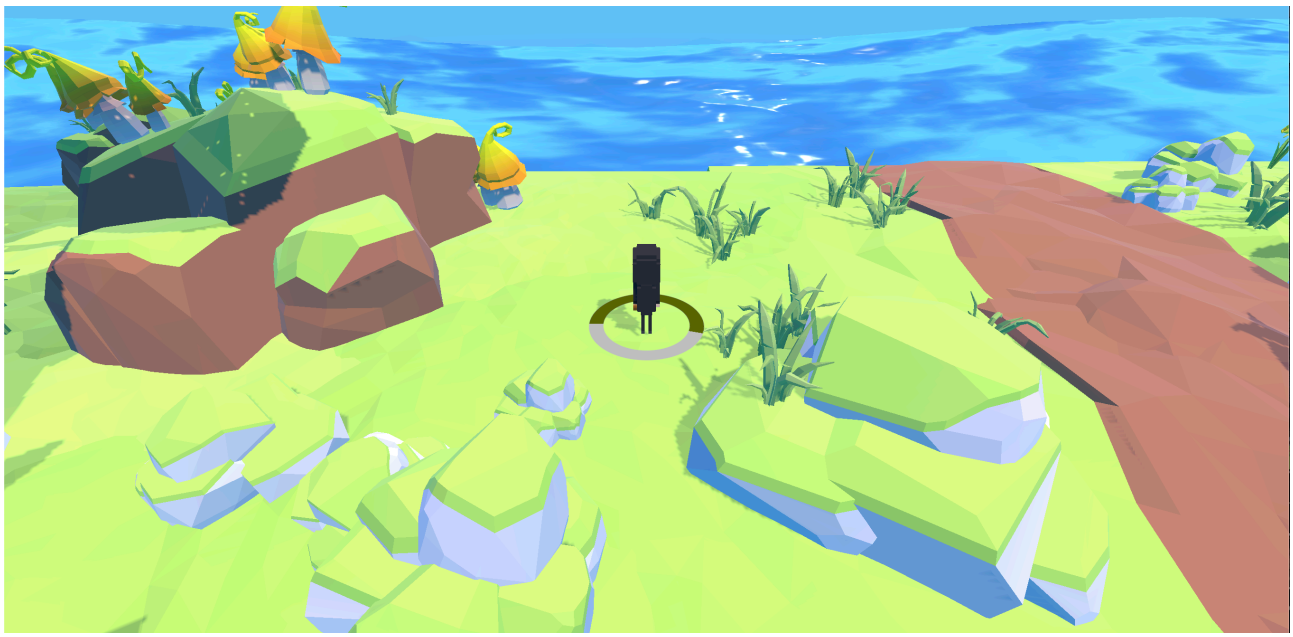
Game Version 4

Idea: After the last version was completed, I found only one terrain that seemed a little monotonous. Because a character can run around, what if he gets to the edge of the terrain? You can't drop it suddenly. It doesn't make sense. So I put salt water around it. So if the player runs to the edge of the terrain and falls, he will fall into the sea, and the game will end. After adding sea water, I thought I'd make the scene a little richer. I increased the sky. In order to echo the beautiful water and beautiful terrain, I think the blue sky is a good choice.
Challenge: I tried a lot of things here, including how to make the water move and not just sit there.
There were also some minor problems with the sky setup. Because under the blue sky, the scene should also be bluer, the design of the shadow part is needed here, so that the scene looks more bright, and the shadow relationship is more normal.

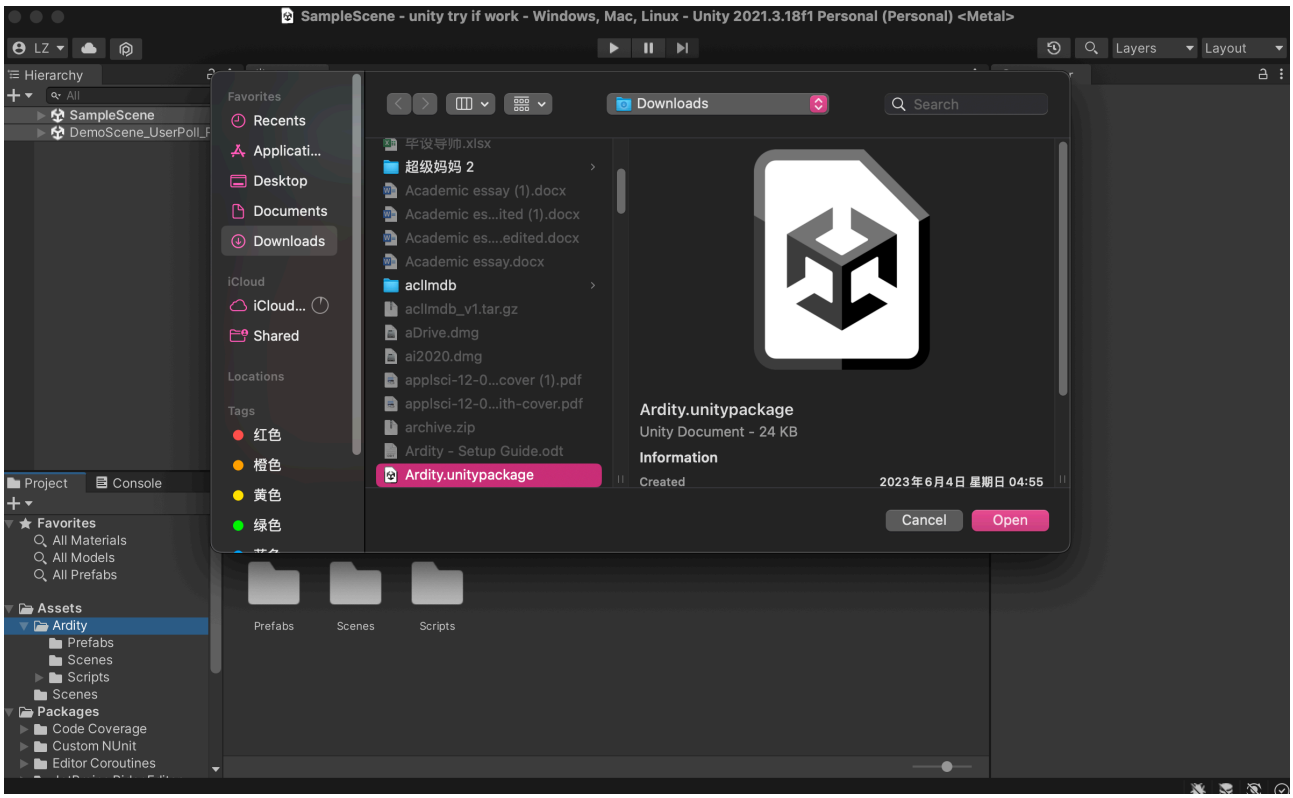






Game Version 5

Idea: In this section, I think I should add the Arduino section. So I started experimenting.
Challenge: To be honest, I didn't do very well at first in this section. Because in the beginning I was trying to use Unity to read the numbers, and Arduino is only responsible for sending the numbers. unity determines the distance and then fires the command. But I found that it didn't work at all. At first, I reviewed my code and changed it many times. I also tried to write code in Unity that would tell me whether the values sent by Arduino could be read or not.
After many attempts, I found that Arduino and Unity did connect to each other, but they couldn't fire bullets.
In this section, I even looked up some plugins on the Web that help Arduino and unity connect, but the result was the same: Arduino and Unity are connected, but they can't fire bullets. So I think maybe it's not a connection problem.
In this section, I re-watched the replay of the lesson, where I took inspiration and further modified my code.
I followed the teacher's approach, handed the distance judgment to Arduino, and further modified the unity code. In my continuous attempts, I finally succeeded.


SampleScene - unity try if work - Windows, Mac, Linux - Unity 2021.3.18f1 Personal (Personal) <Metal>
Hierarchy
SampleScene
DemoScene_UserPoll_F
Favorites
Recents
Applicati...
Desktop
Documents
Downloads
iCloud
iCloud...
Shared
Locations
Tags
红色
橙色
黄色
绿色
Downloads
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Academic es....edited.docx
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archive.zip
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Ardity.unitypackage
Ardity.unitypackage
Unity Document - 24 KB
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All Models
All Prefabs
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Code Coverage
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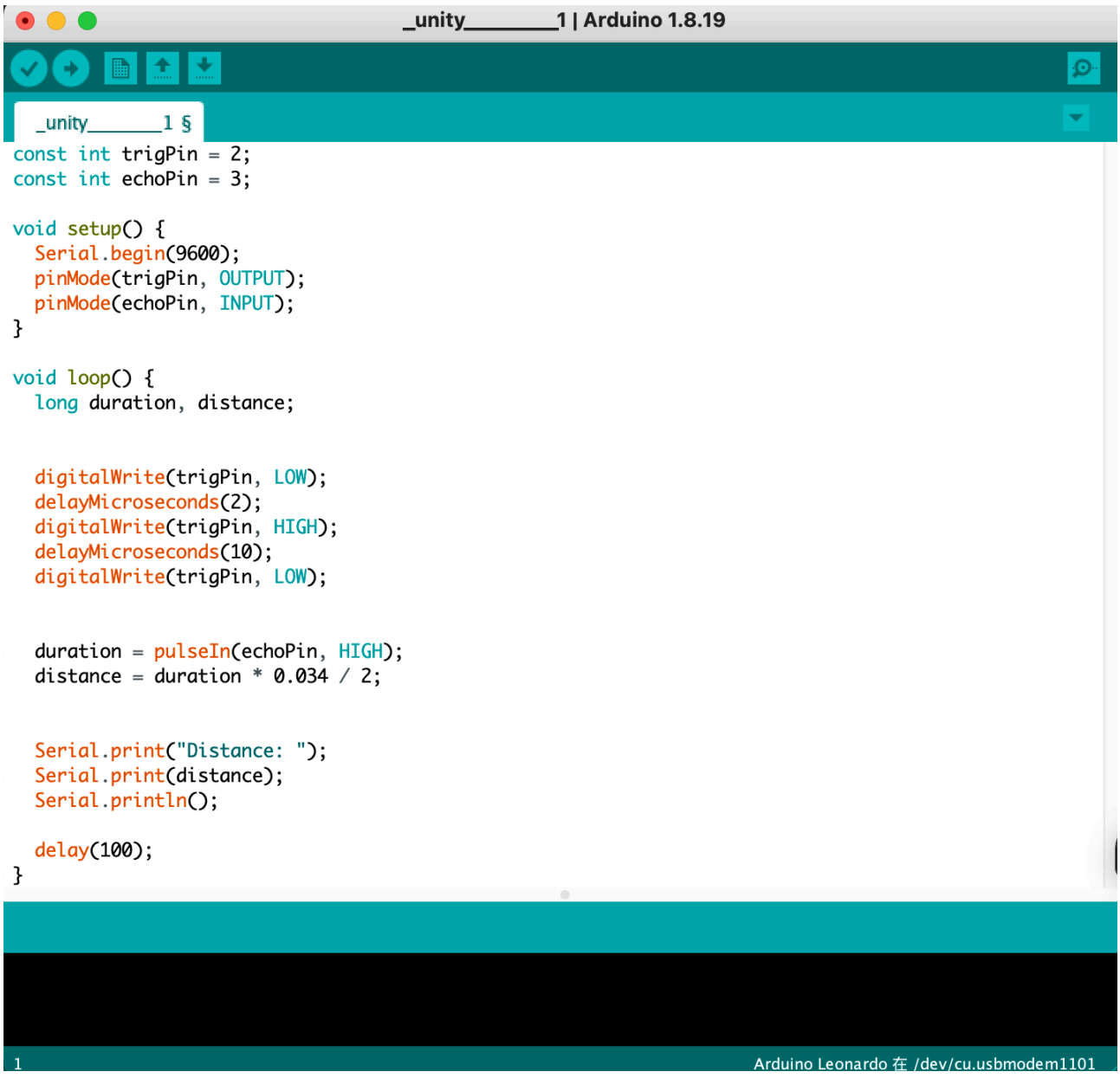
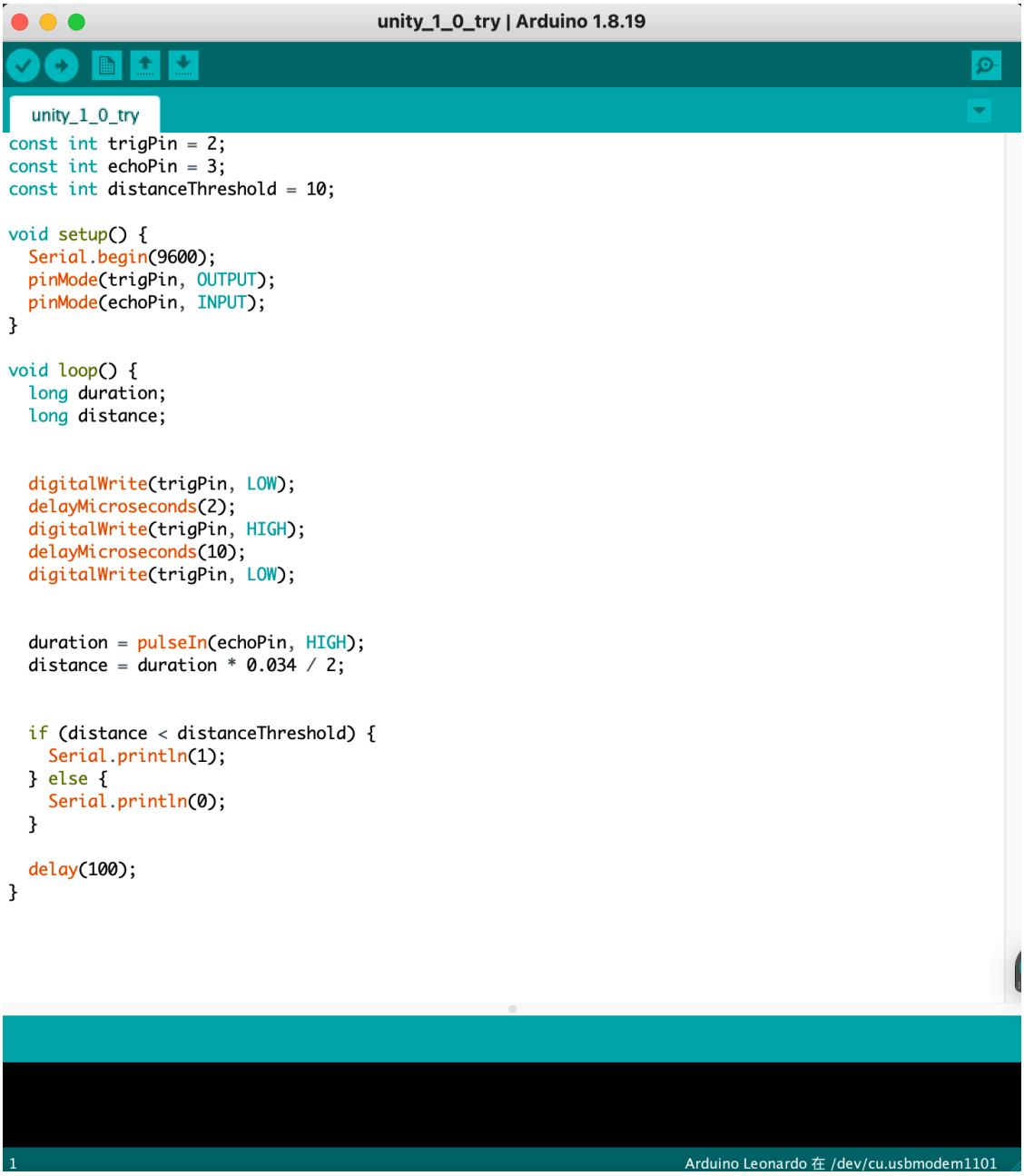
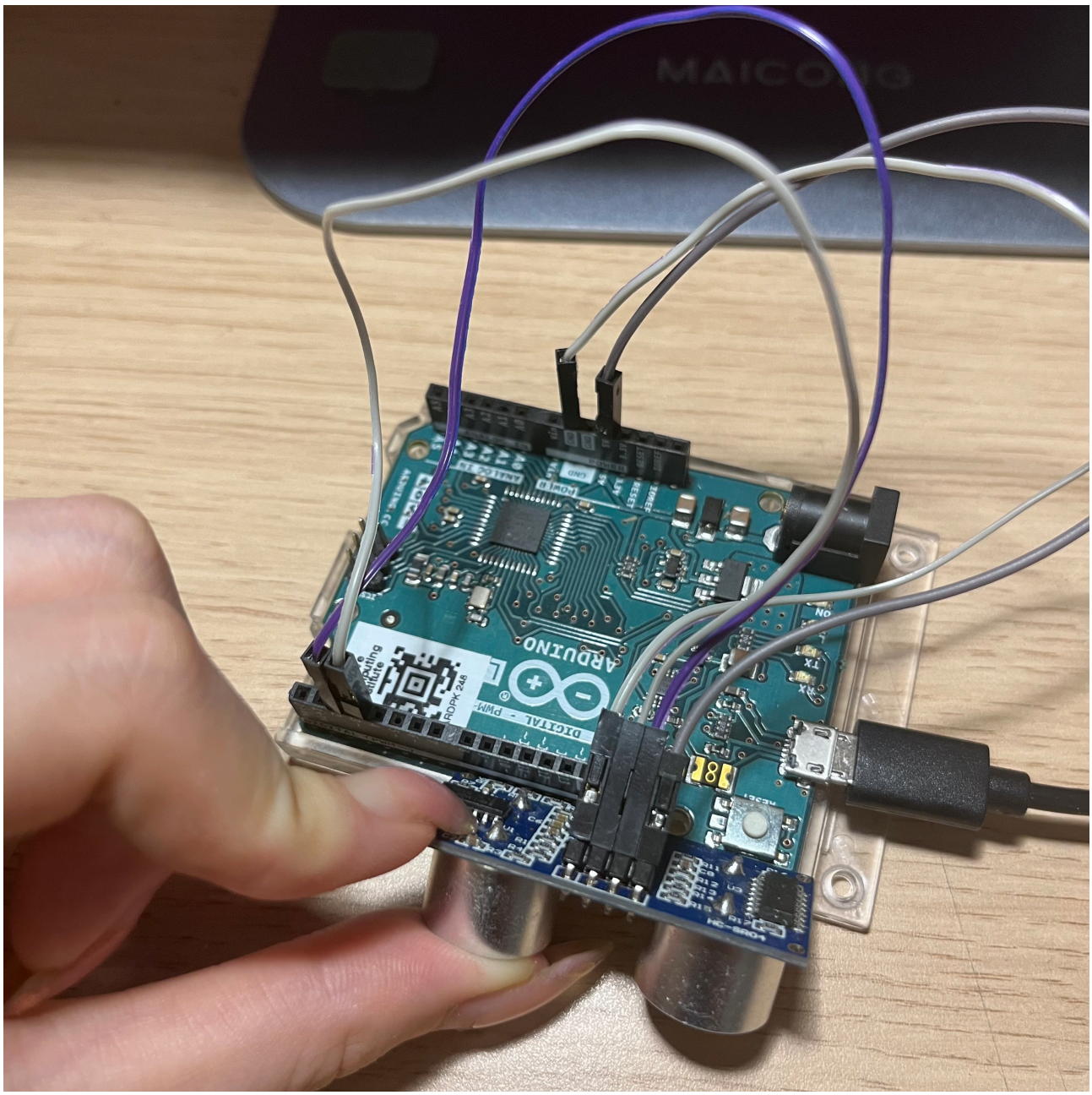
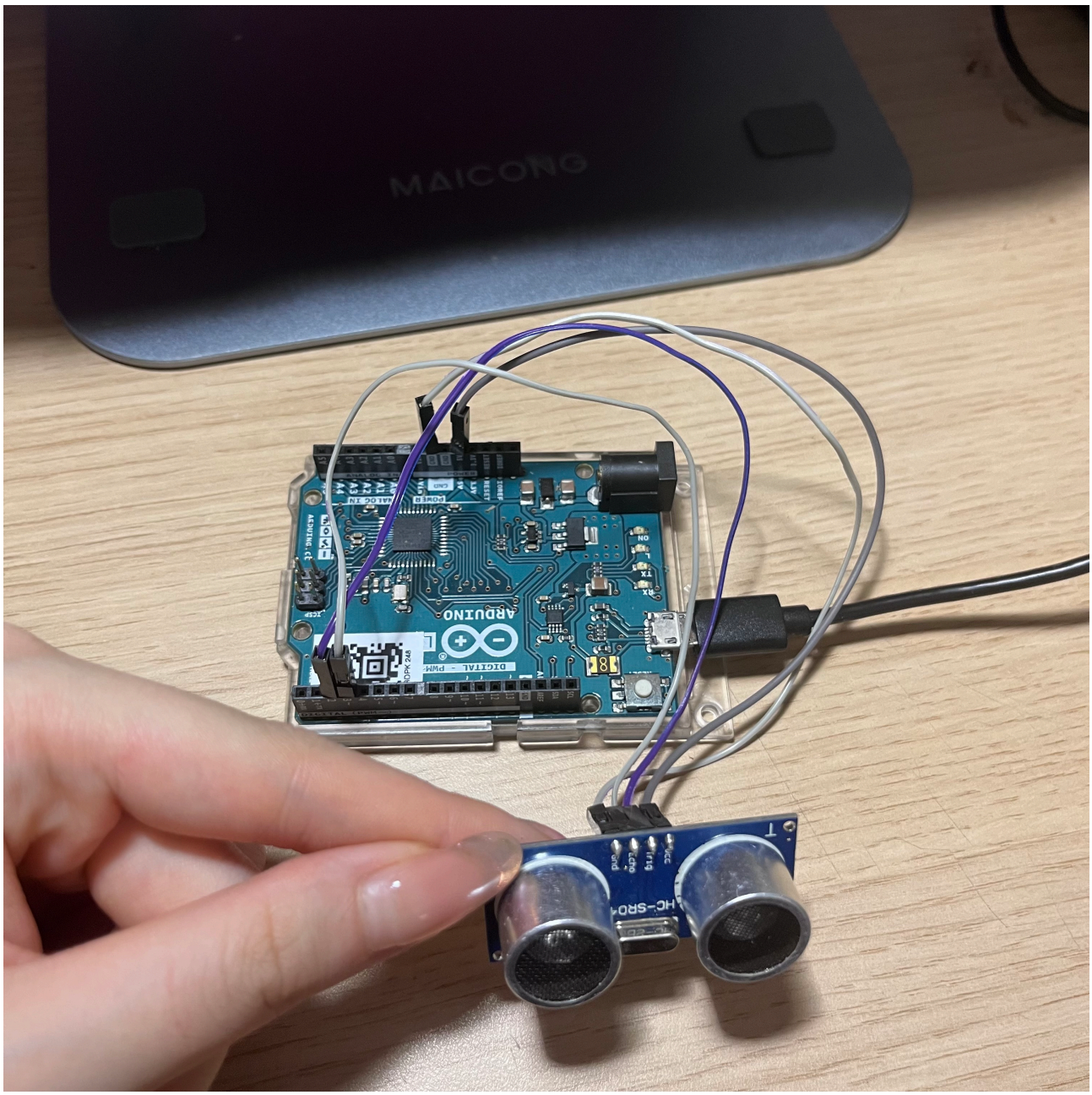
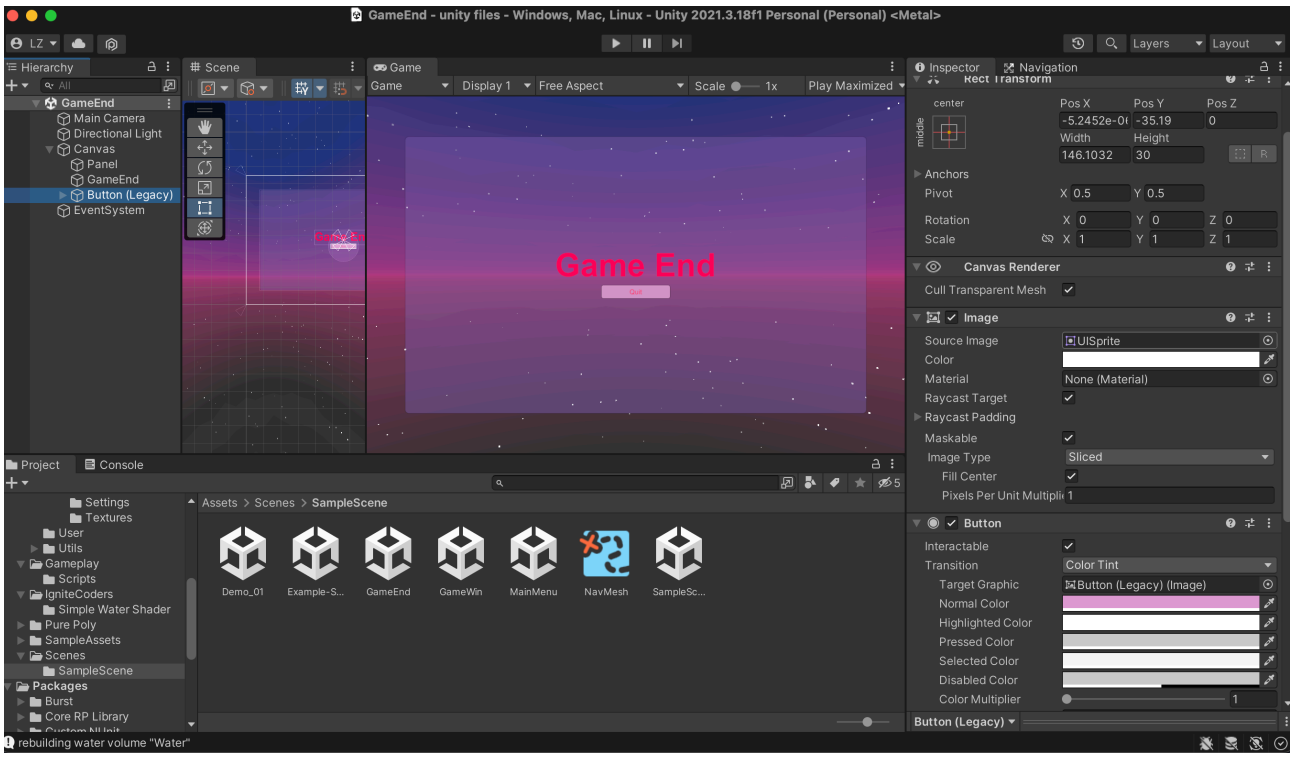
Prefabs
Scenes
Scripts


_unity_____1 | Arduino 1.8.19
_unity_____1 §
const int trigPin = 2;
const int echoPin = 3;
void setup() {
Serial.begin(9600);
pinMode(trigPin, OUTPUT);
pinMode(echoPin, INPUT);
}
void loop() {
long duration, distance;
digitalWrite(trigPin, LOW);
delayMicroseconds(2);
digitalWrite(trigPin, HIGH);
delayMicroseconds(10);
digitalWrite(trigPin, LOW);
duration = pulseIn(echoPin, HIGH);
distance = duration * 0.034 / 2;
Serial.print("Distance: ");
Serial.print(distance);
Serial.println();
delay(100);
}
1
Arduino Leonardo 在 /dev/cu.usbmodem1101


unity_1_0_try | Arduino 1.8.19
unity_1_0_try
const int trigPin = 2;
const int echoPin = 3;
const int distanceThreshold = 10;
void setup() {
Serial.begin(9600);
pinMode(trigPin, OUTPUT);
pinMode(echoPin, INPUT);
}
void loop() {
long duration;
long distance;
digitalWrite(trigPin, LOW);
delayMicroseconds(2);
digitalWrite(trigPin, HIGH);
delayMicroseconds(10);
digitalWrite(trigPin, LOW);
duration = pulseIn(echoPin, HIGH);
distance = duration * 0.034 / 2;
if (distance < distanceThreshold) {
Serial.println(1);
} else {
Serial.println(0);
}
delay(100);
}
1
Arduino Leonardo 在 /dev/cu.usbmodem1101


ARDUINO
DIGITAL


MAICONG
ARDUINO
HC-SR04



Game Version 6 (Final version)

Idea: This is the end of the design process. I made a different interface according to the online tutorial, and modified the relevant code, so that the game can go smoothly. For example, the player can start the game by clicking the "Start" button, and after the player defeats the enemy, the "congratulations" interface will pop out. And the player can choose to click and play again. When the player is defeated, he will jump to the "failure screen", and the player can choose to quit the game.

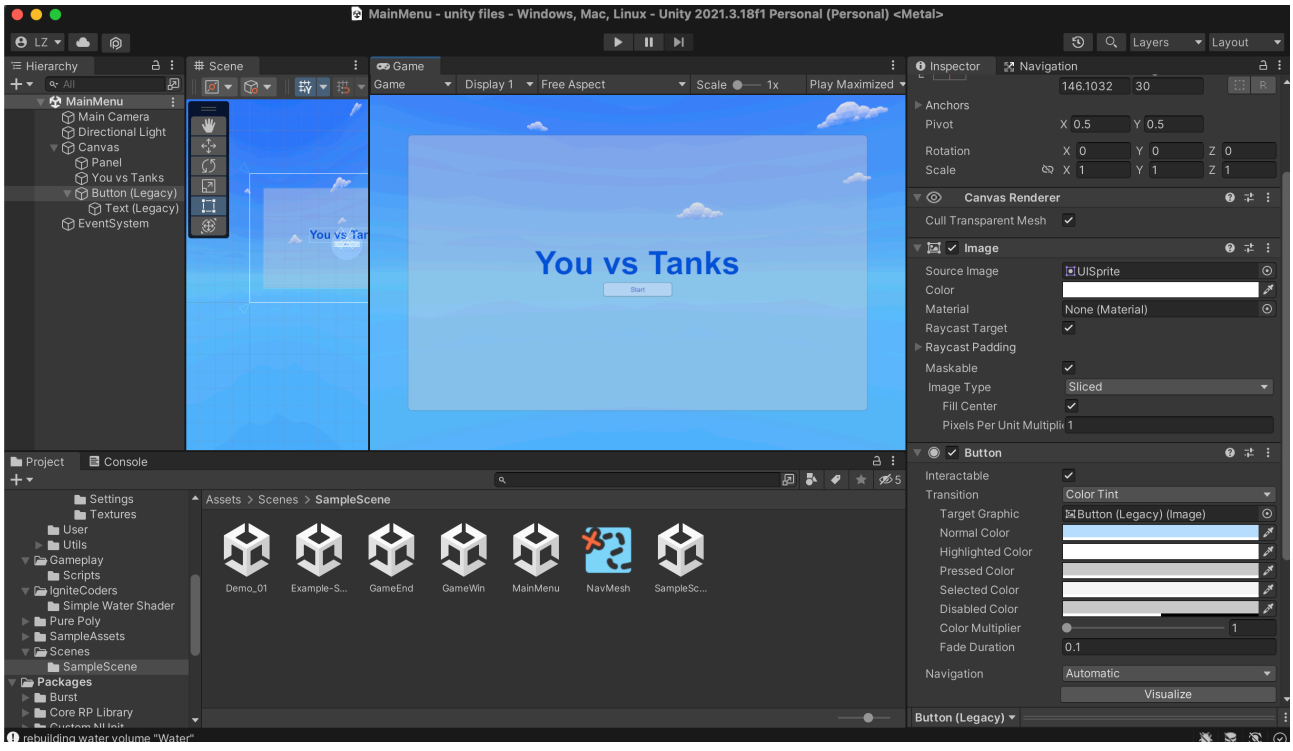
At the same time, I made some improvements to the arduino part and made the decoration. I started with smaller devices that allowed the player to throw weapons like the game character. But the effect is not very good, because the ultrasonic sensor is not very good to receive the data. So I made the device a little bigger and changed the mode of operation from throwing to "holding the weapon and throwing".

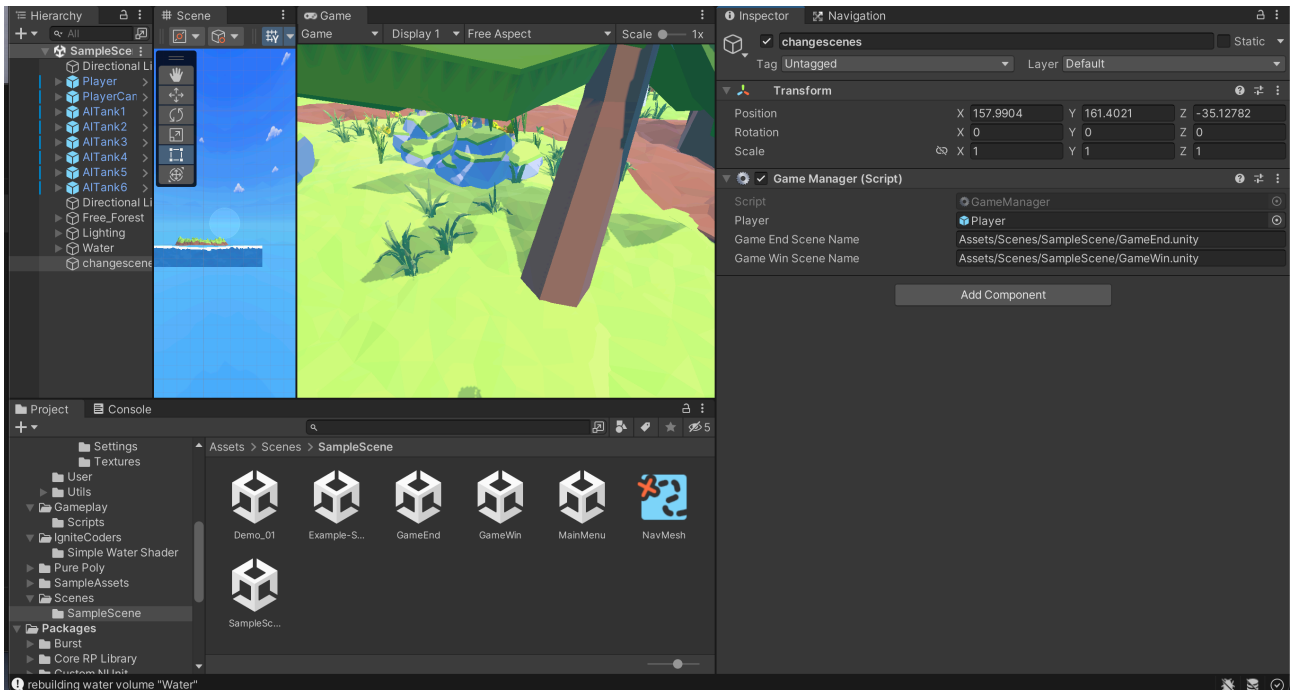
Challenge: Part of the challenge in this part is to modify the relevant code so that the game interface can jump smoothly, as well as the design of the game interface and key links, etc. The character code has also been slightly changed.

The Arduino sensor part is constantly tweaked, but overall, it's worth it for the results.


HC-SR04
Vcc
Trig
Echo
Gnd


HC-SR04
Vcc
Trig
Echo
Gnd


MainMenu - unity files - Windows, Mac, Linux - Unity 2021.3.18f1 Personal (Personal) <Metal>
Hierarchy
MainMenu
Main Camera
Directional Light
Canvas
Panel
You vs Tanks
Button (Legacy)
Text (Legacy)
EventSystem
Scene
Game
Display 1
Free Aspect
Scale
1x
Play Maximized
You vs Tanks
Start
Inspector
Navigation
Anchors
Pivot
Rotation
Scale
Canvas Renderer
Cull Transparent Mesh
Image
Source Image
UISprite
Color
Material
None (Material)
Raycast Target
Raycast Padding
Maskable
Image Type
Sliced
Fill Center
Button
Interactable
Transition
Color Tint
Target Graphic
Button (Legacy) (Image)
Normal Color
Highlighted Color
Pressed Color
Selected Color
Disabled Color
Color Multiplier
Fade Duration
Navigation
Automatic
Visualize
Project
Console
Assets > Scenes > SampleScene
Demo_01
Example-S...
GameEnd
GameWin
MainMenu
NavMesh
SampleSc...
Settings
Textures
User
Utils
Gameplay
Scripts
IgniteCoders
Simple Water Shader
Pure Poly
SampleAssets
Scenes
SampleScene
Packages
Burst
Core RP Library
Button (Legacy)


Hierarchy
Scene
Game
Inspector
Navigation
changescenes
Static
Tag Untagged
Layer Default
Transform
Position X 157.9904 Y 161.4021 Z -35.12782
Rotation X 0 Y 0 Z 0
Scale X 1 Y 1 Z 1
Game Manager (Script)
Script GameManager
Player Player
Game End Scene Name Assets/Scenes/SampleScene/GameEnd.unity
Game Win Scene Name Assets/Scenes/SampleScene/GameWin.unity
Add Component
Project
Console
Assets > Scenes > SampleScene
Demo_01
Example-S...
GameEnd
GameWin
MainMenu
NavMesh
SampleSc...
rebuilding water volume "Water"