

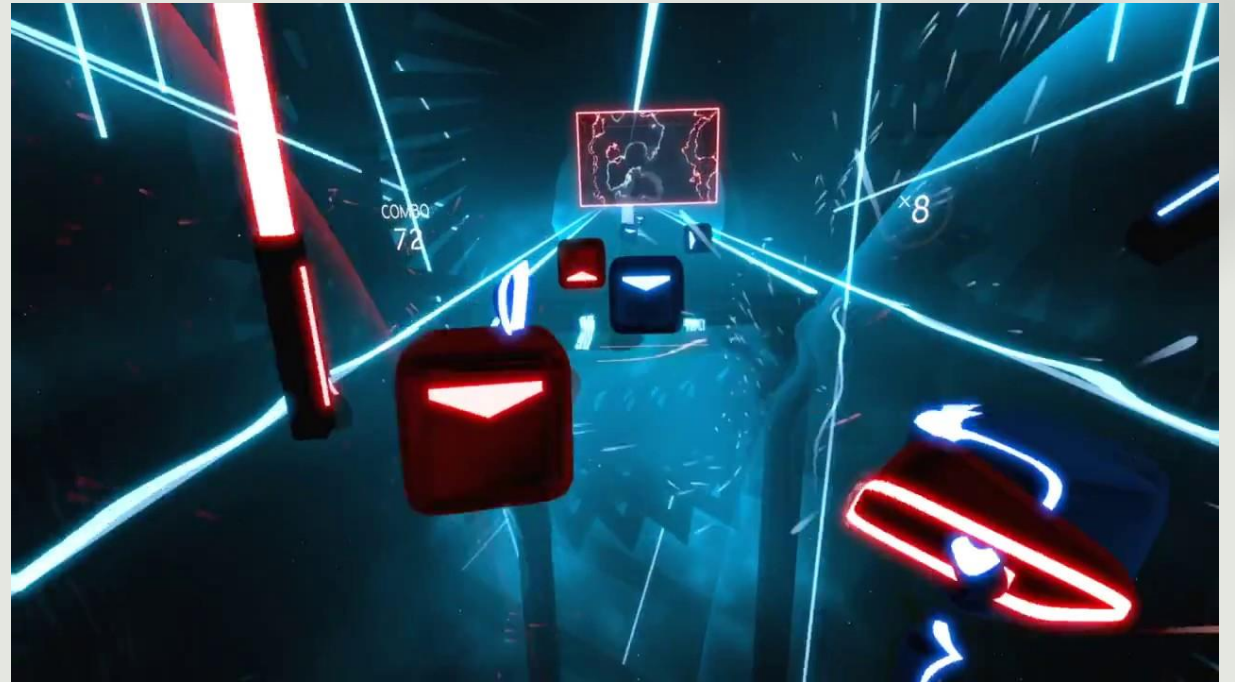
The background is a blurred, high-speed photograph of a train track. A train is visible in the distance, moving towards the viewer. The tracks recede into the distance, creating a strong sense of perspective. A faint, large watermark of a leaf or branch is visible in the upper right quadrant. The overall color palette is muted, with greys, blues, and greens.

TDD in Unity

Tobias Stübi

What is Unity

- Cross-platform game engine
- Developed by Unity Technologies
- Easy to use for beginner developers
- Popular for indie game development.
- 3D and 2D games





2DShooter - SampleScene - Windows, Mac, Linux - Unity 2021.3.0f1 Personal <DX11>

File Edit Assets GameObject Component Jobs Window Help

TS

Hierarchy

- SampleScene
 - Main Camera
 - Player
 - Square
 - WallN
 - WallS
 - WallE
 - WallW
 - Enemy
 - EventSystem
 - Canvas
 - FireRateUp
 - MagSizeUp
 - Enemy (1)
 - Enemy (2)
 - Square (1)
 - WallE (1)
 - Enemy (3)
 - Enemy (4)
 - Enemy (5)
 - Enemy (6)
 - Enemy (7)
 - Enemy (8)
 - Enemy (9)
 - Square (2)
 - Square (3)
 - Square (4)
 - FireRateUp (1)

Scene

Inspector

Services Test Runner

Player

Tag Player Layer Default

Transform

Position	X 4.27	Y -2.54	Z 0
Rotation	X 0	Y 0	Z 0
Scale	X 1	Y 1	Z 1

Sprite Renderer

Sprite Circle

Color

Flip X Y

Draw Mode Simple

Mask Interaction None

Sprite Sort Point Center

Material Sprites-Default

Additional Settings

Sorting Layer Player

Order in Layer 0

Circle Collider 2D

Edit Collider

Material None (Physics Material 2D)

Is Trigger

Used By Effector

Offset X 0 Y 0

Radius 0.5

Rigidbody 2D

Body Type Dynamic

Material None (Physics Material 2D)

Simulated

Use Auto Mass

Mass 1

Linear Drag 0

Angular Drag 0.05

Gravity Scale 0

Collision Detection Discrete

Sleeping Mode Start Awake

Interpolate None

Constraints

Freeze Position X Y Z

Freeze Rotation

Info

Player Controller (Script)

Script PlayerController

Move Speed 5

Weapon Weapon (Weapon)

Rb Player (Rigidbody 2D)

Sprites-Default (Material)

Shader Sprites/Default

Add Component

Project Console

Assets > Scripts

Bullet Collectible Follow_pl... PlayerCont... Scripts Weapon

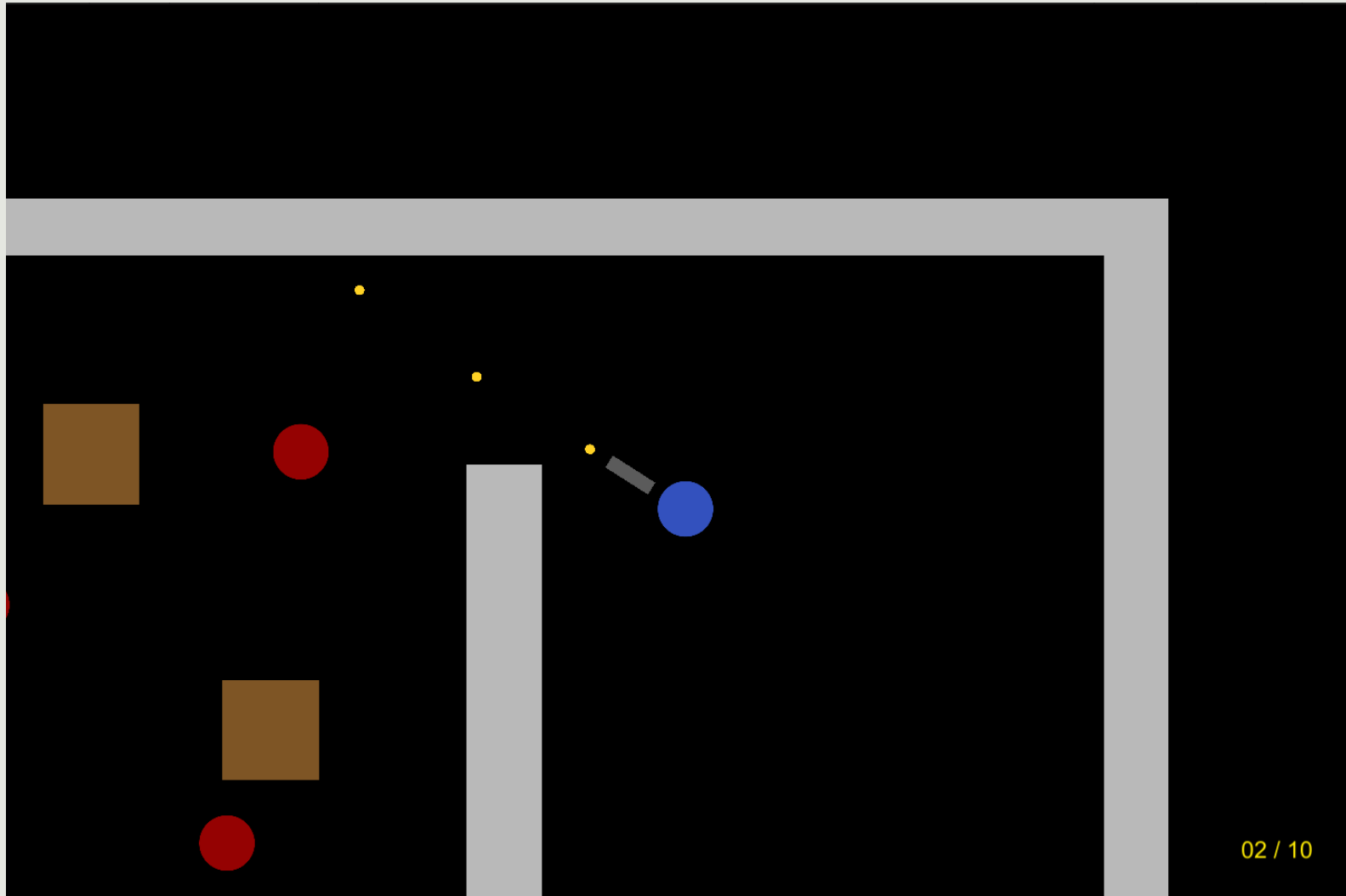
Assets

- Scenes
- Scripts
- Tests
- TextMesh Pro

Packages

- 2D Animation
- 2D Common
- 2D Path

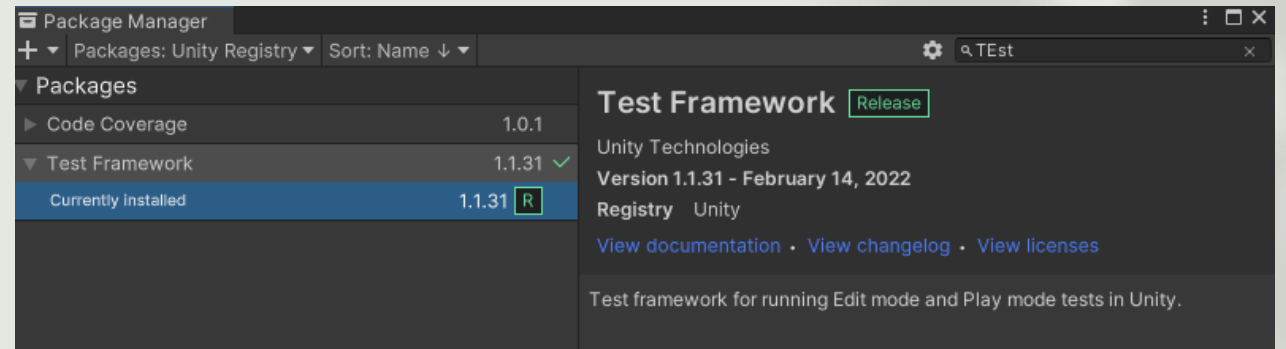
Simple 2D Top-down Shooter



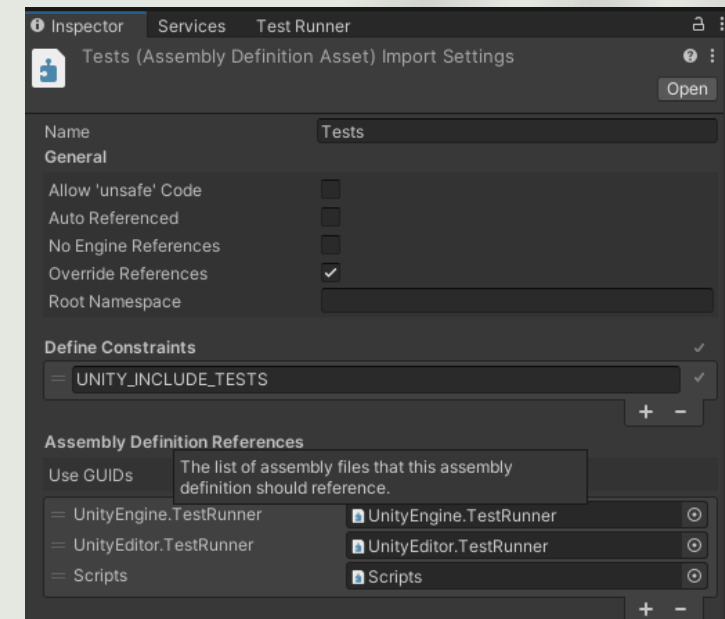
- Camera follows Player
- Move with WASD
- Cannot walk into walls or boxes
- Enemies can be shot
- Pickups to change the weapon behavior

Test Setup

- Unity 2021.3
- Test Framework Package



- Script Assembly Definition Asset in Scripts folder
- Test Assembly Definition Asset in Tests folder



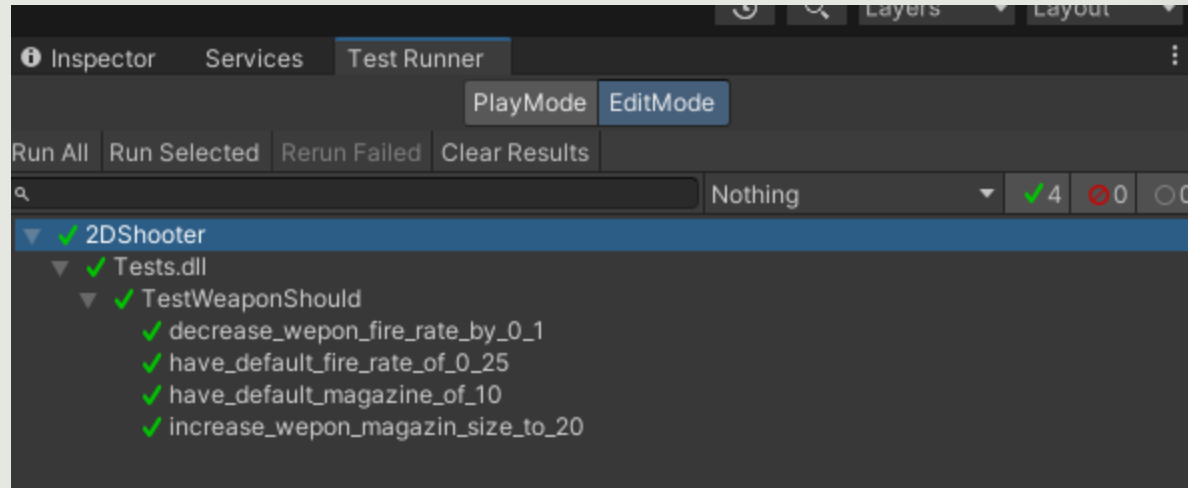
Test

```
Assets > Tests > TestWeaponShould.cs > ...
1 using NUnit.Framework;
2 using UnityEngine;
3 using System;
4
0 references | Run All Tests | Debug All Tests
5 public class TestWeaponShould
6 {
7
8     [Test]
9     0 references | Run Test | Debug Test
10    public void have_default_magazine_of_10()
11    {
12        Weapon weapon = new Weapon();
13
14        Assert.AreEqual(10, weapon.magSize);
15    }
16
17    [Test]
18    0 references | Run Test | Debug Test
19    public void have_default_fire_rate_of_0_25()
20    {
21        Weapon weapon = new Weapon();
22
23        Assert.AreEqual(0.25f, weapon.fireRate);
24    }
25
26    [Test]
27    0 references | Run Test | Debug Test
28    public void decrease_wepon_fire_rate_by_0_1()
29    {
30        Weapon weapon = new Weapon();
31
32        weapon.decreaseFireRate(0.1f);
33
34        Assert.AreEqual(0.15f, weapon.fireRate);
35    }
36
37    [Test]
38    0 references | Run Test | Debug Test
39    public void increase_wepon_magazin_size_to_20()
40    {
41        Weapon weapon = new Weapon();
42
43        weapon.increaseMagSize(10);
44
45        Assert.AreEqual(20, weapon.magSize);
46    }
47 }
```

Script

```
Assets > Scripts > Weapon.cs > Weapon
1 using System.Collections;
2 using System.Collections.Generic;
3 using UnityEngine;
4 using UnityEngine.UI;
5
10 references
6 public class Weapon : MonoBehaviour
7 {
8
9     0 references
10    public int bullets = 10;
11    3 references
12    public int magSize = 10;
13    3 references
14    public float fireRate = 0.25f;
15
16    2 references
17    public void decreaseFireRate(float value){
18        fireRate -= value;
19    }
20
21    2 references
22    public void increaseMagSize(float value){
23        magSize += ((int)value);
24    }
25 }
```

Test Runner





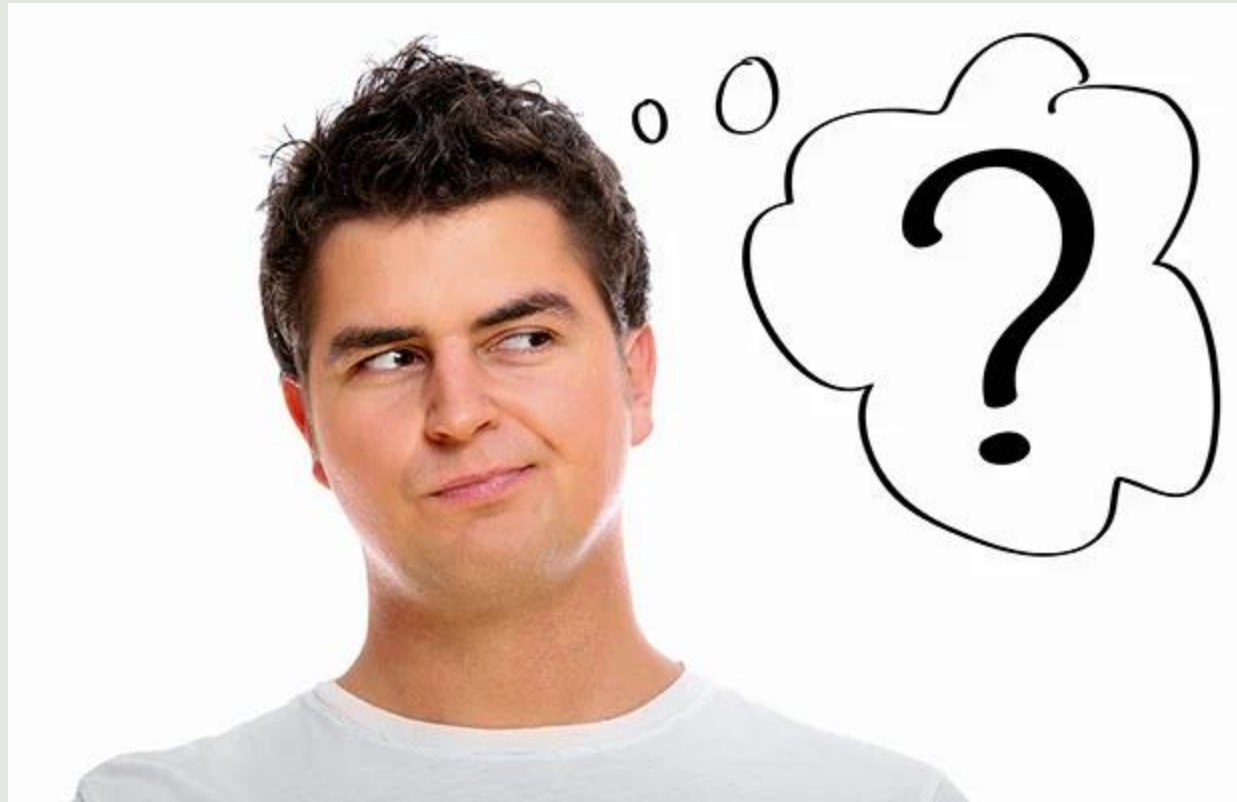
SO

WHAT'S

NEXT

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Questions?





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