BINUS UNIVERSITY

People
Innovation
Excellence

Course : 2D Game Programming

Effective Period : September 2016

2D Game Programing
LAB 04

BINUS UNIVERSITY

People
Innovation
Excellence

Acknowledgement

These slides have been adapted from:

Pereira, V. (2014). Learning Unity 2D Game Development by Example, Packt Publishing, Inc. San Francisco. ISBN: 9781783559046

Chapter 4

BINUS UNIVERSITY

Learning Objectives

LO 1 : Create 2D game for PC platform
LO 3 : Design 2D game for PC platform

People
Innovation
Excellence

BINUS UNIVERSITY

People
Innovation
Excellence

Let's add enemies to our game.

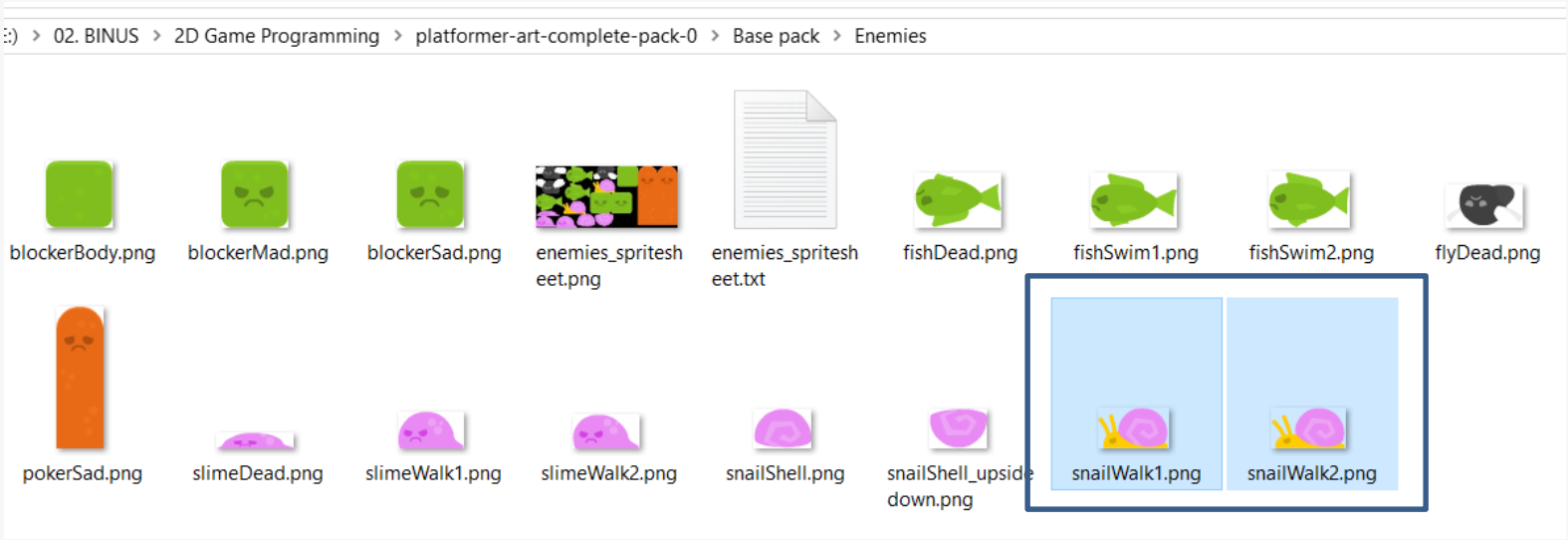
MAKING ENEMIES?

BINUS UNIVERSITY

People
Innovation
Excellence

Let's add the enemy...

Search for snail on kenney's platformer pack

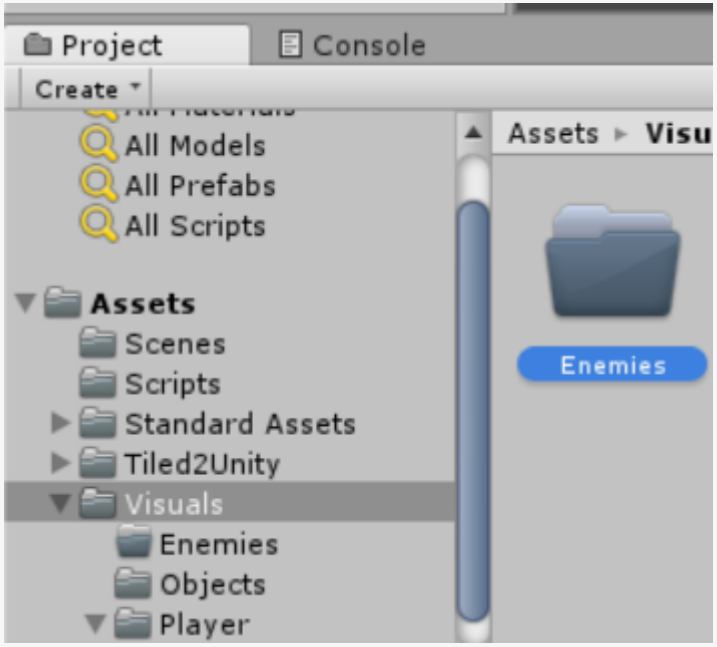


BINUS UNIVERSITY

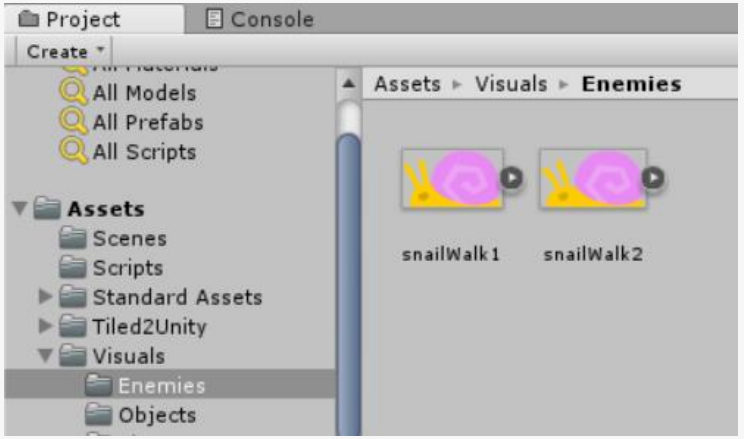
People
Innovation
Excellence

Setting the enemies

Create new folder called Enemies



Move the 2 images of
snail into the folder

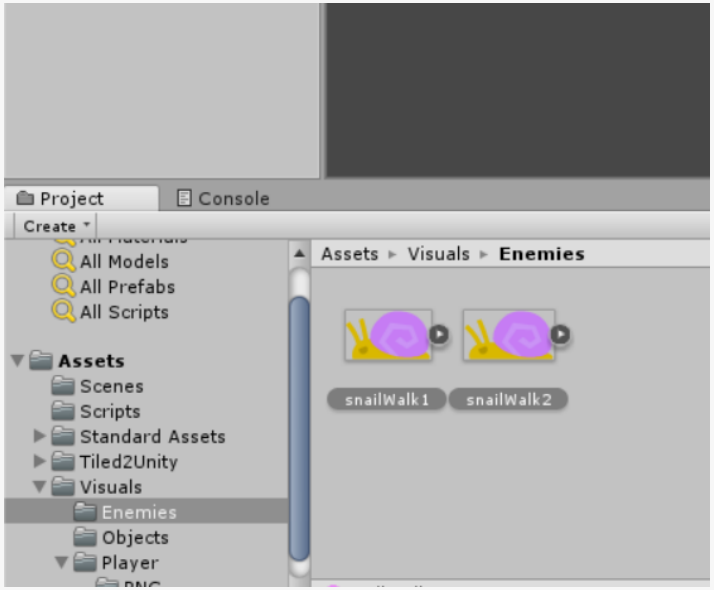


BINUS UNIVERSITY

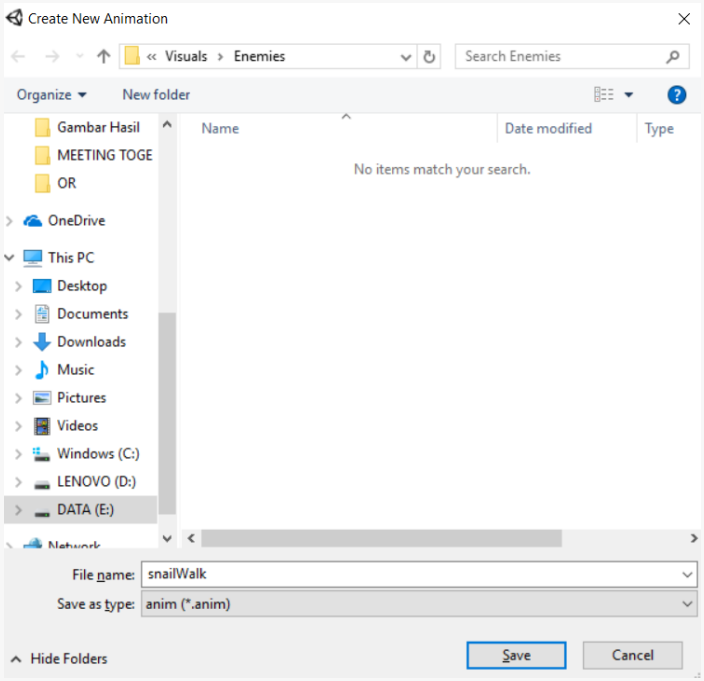
People
Innovation
Excellence

Start the animation

drag and drop both snailWalk1 and snailWalk2 into the scene to create the animation

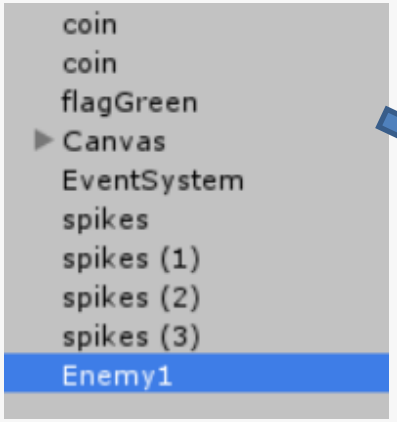


Name the animation snailWalk

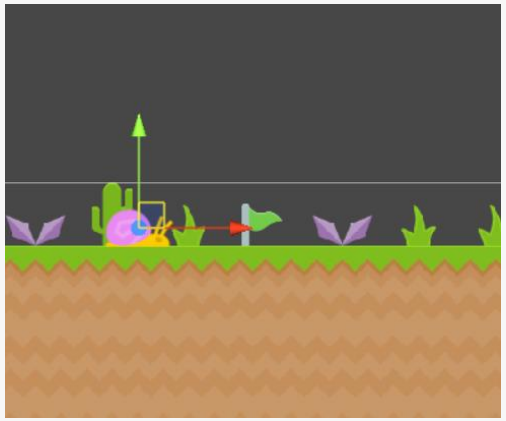


Making enemies

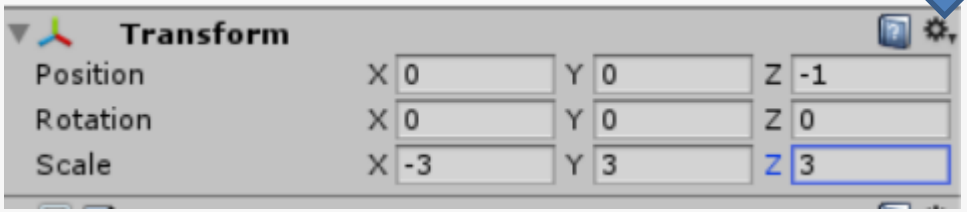
Rename the game object Enemy1



Make sure the animation is there



Move the position near a flag and edit the scale as follows



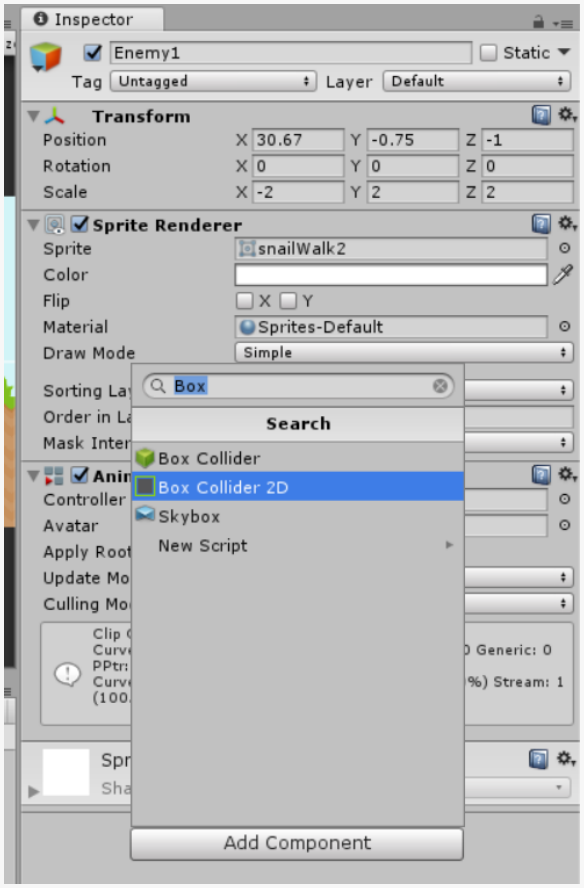
People
Innovation
Excellence

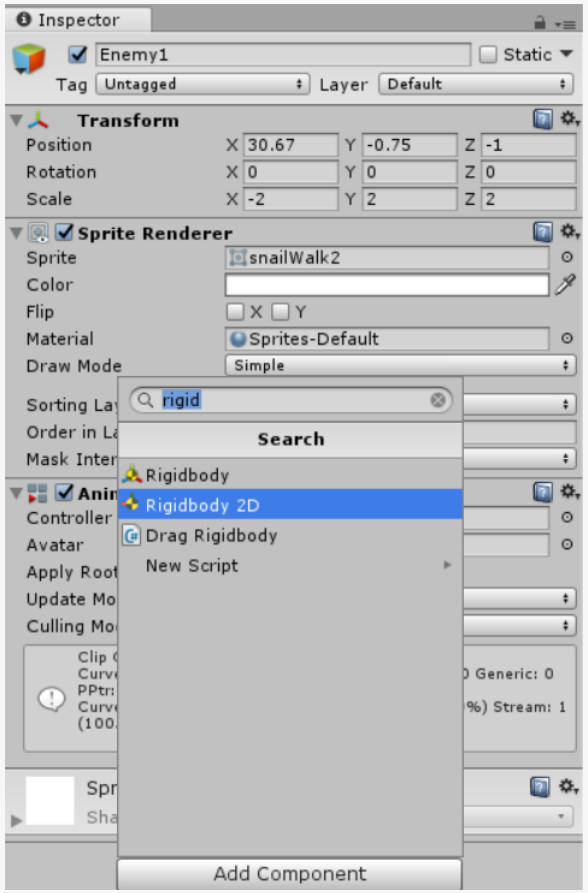
BINUS UNIVERSITY

People
Innovation
Excellence

Enemies properties

Let's add Box Collider 2D and RigidBody



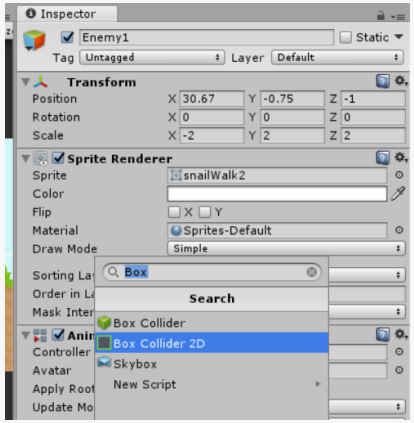


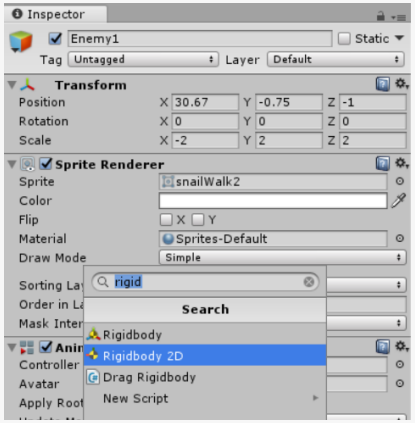
BINUS UNIVERSITY

People
Innovation
Excellence

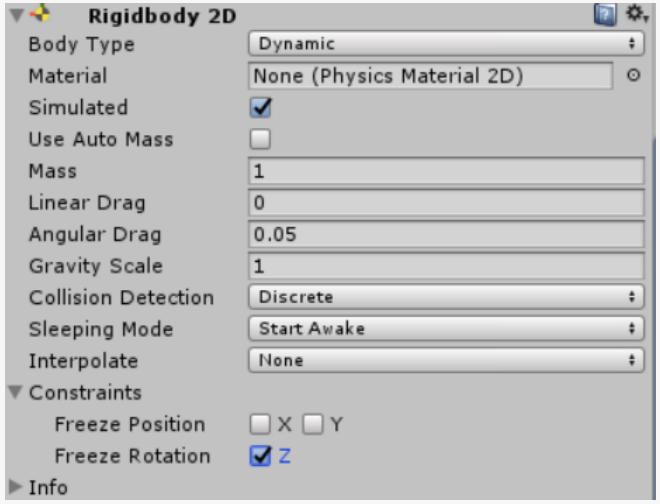
Enemies properties

Let's add Box Collider 2D and RigidBody



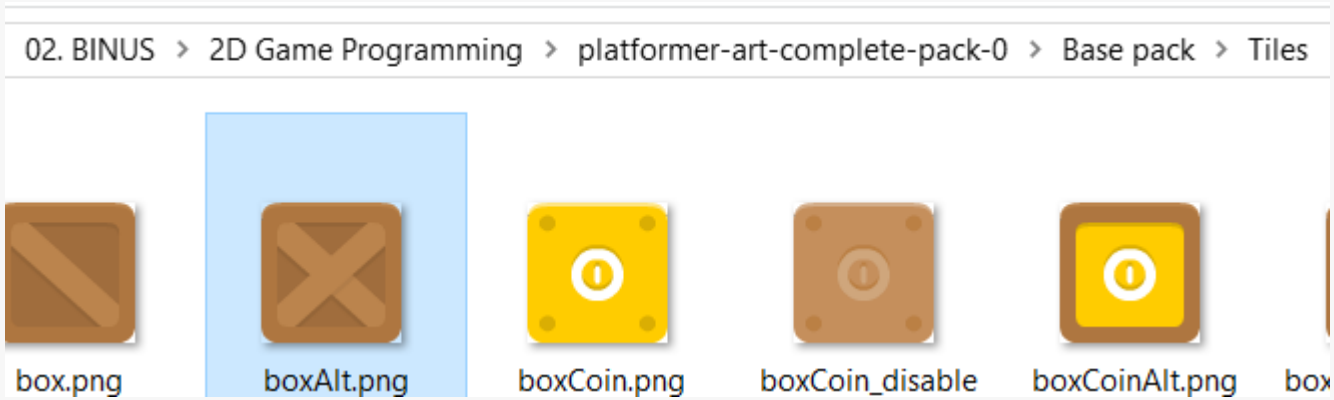


Make sure to freeze the rotation for Z-axis

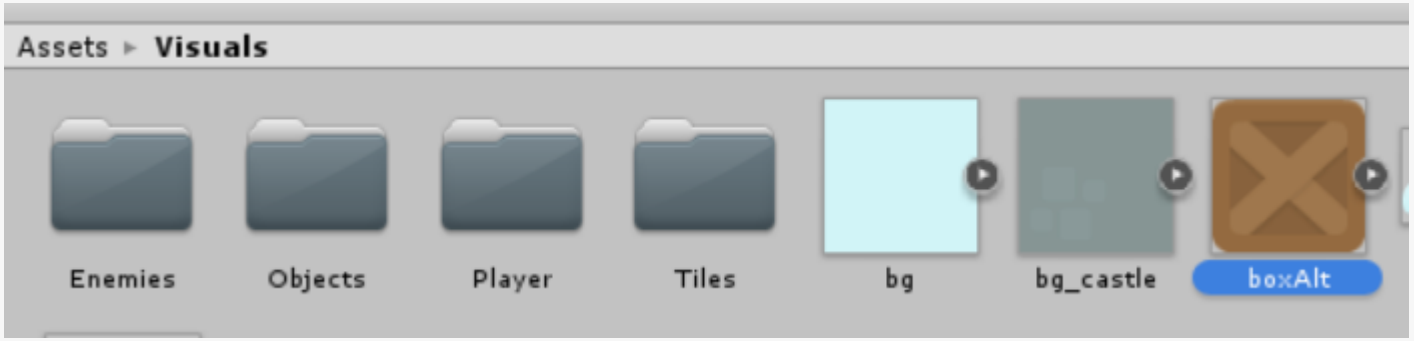


Add enemies obstacle

Search for boxAlt.png from the platformer art pack

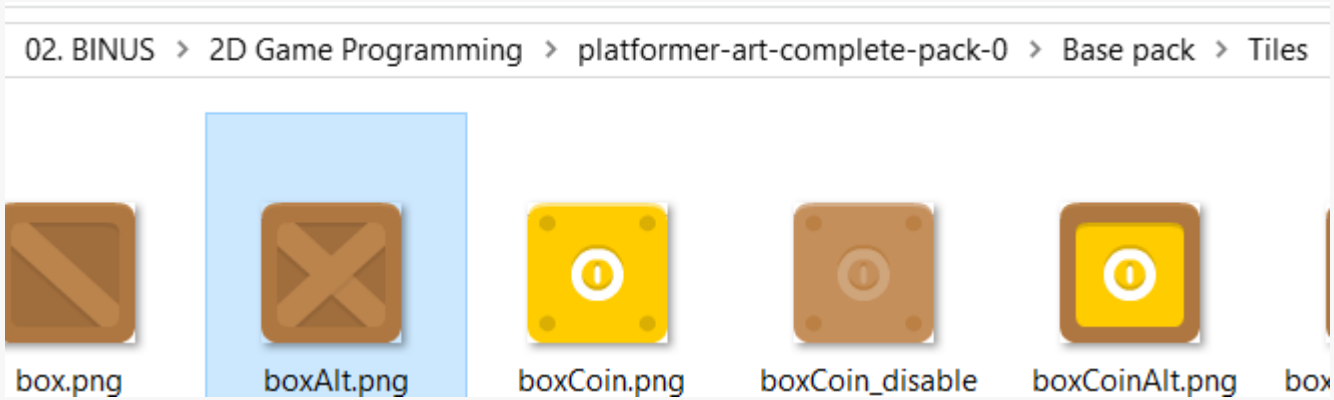


Move it to the project

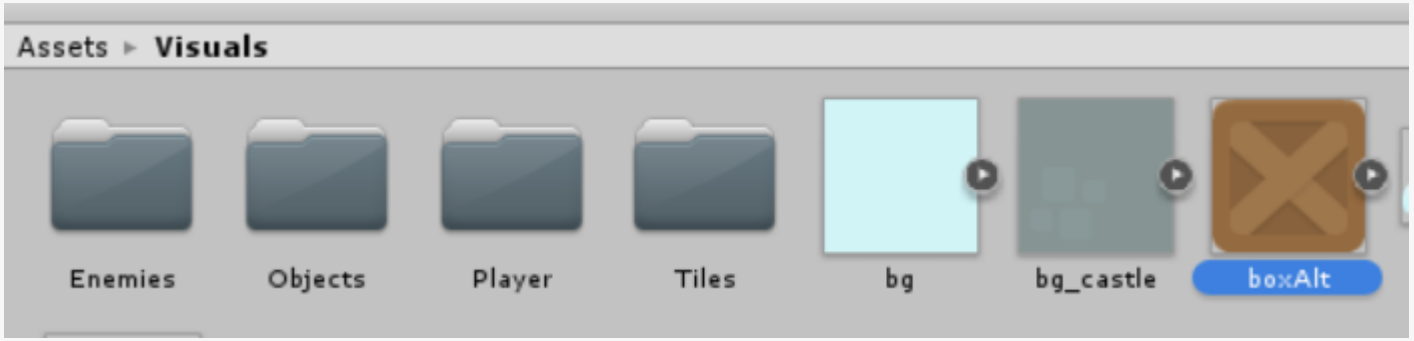


Add enemies obstacle

Search for boxAlt.png from the platformer art pack



Move it to the project

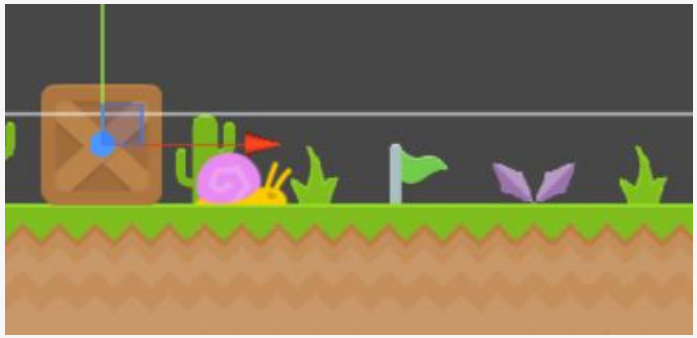


BINUS UNIVERSITY

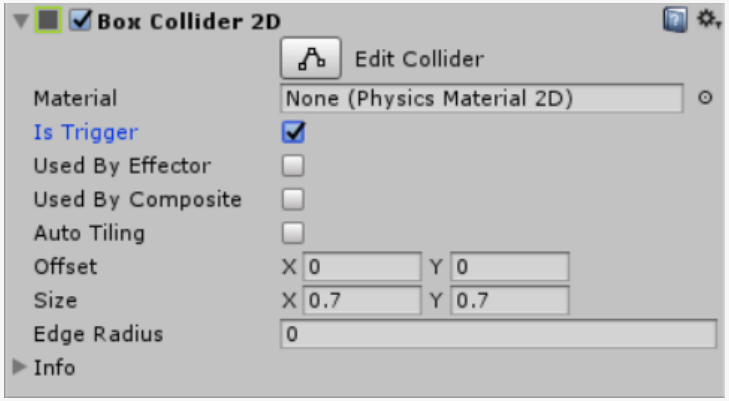
People
Innovation
Excellence

Add enemies obstacle

Move it to the scene near the enemies



Add collider and set isTrigger to true

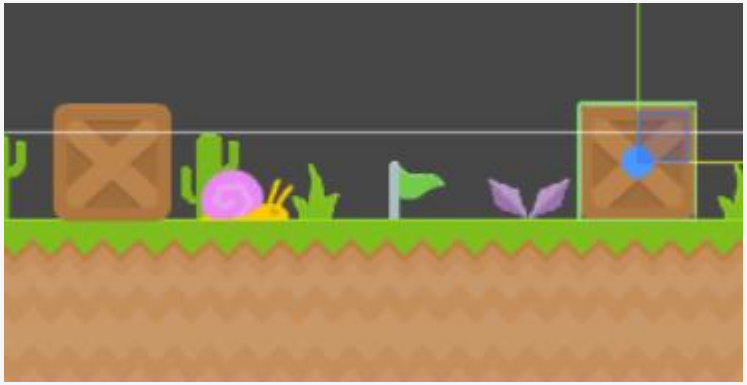


BINUS UNIVERSITY

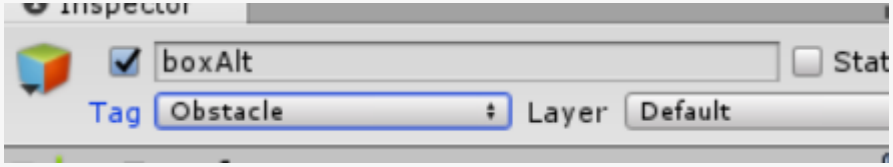
People
Innovation
Excellence

Add enemies obstacle

Add new tag called Obstacle



Apply the tag to the box

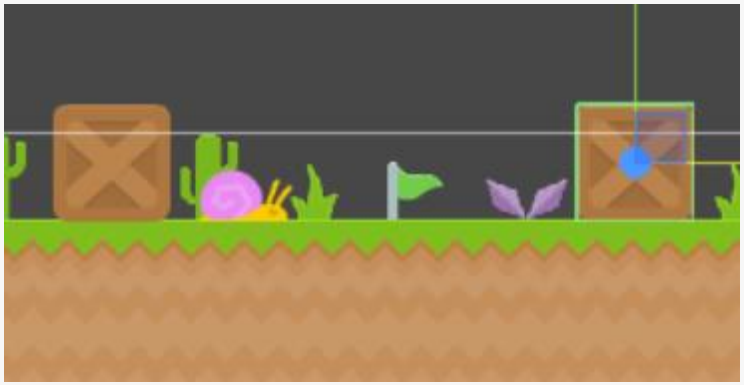


BINUS UNIVERSITY

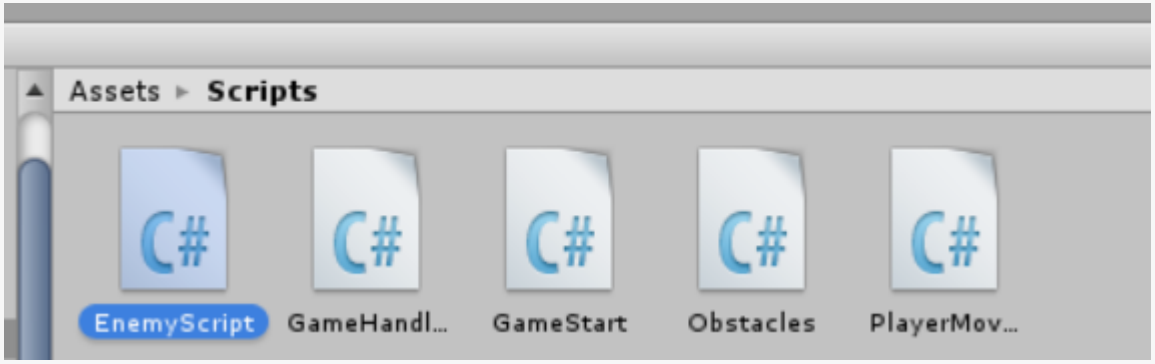
People
Innovation
Excellence

Add enemies obstacle

Create another box on the other side of the flag



Create a new script named EnemyScript



Let's do some script

We first need to add some variables to store the speed of the enemy, its velocity vector, and scale

```
1 using System.Collections;
2 using System.Collections.Generic;
3 using UnityEngine;
4
5 public class EnemyScript : MonoBehaviour {
6
7     public float speed = 1;
8     Vector2 curVelocity;
9     Vector3 curScale;
10
```

Update the start function, we need to initialize its velocity in the rigid body.

```
// Use this for initialization
void Start () {
    //Set initial direction and speed
    GetComponent<Rigidbody2D>().velocity = new Vector2(-1 * speed, 0);
}
```

Let's do some script

In the Update() function, we need to check if the enemy stops, and make it resume its walking

```
// Update is called once per frame
void Update () {
    //get the current velocity
    curVelocity = GetComponent<Rigidbody2D>().velocity;
    //Resume walking if the enemy stops
    if (curVelocity.x == 0) {
        transform.position = new Vector2(transform.position.x,transform.position.y + 0.01f);
        GetComponent<Rigidbody2D>().velocity = new Vector2(curScale.x >0 ? -1 : 1 * speed, 0);
    }

}
```

BINUS UNIVERSITY

People
Innovation
Excellence

Let's do some script

We need to create the OnTriggerEnter2D() function to detect if the enemy touched an obstacle, so it needs to change direction, or if the player killed it by jumping on it:

```
void OnTriggerEnter2D(Collider2D c) {
    if (c.tag == "Obstacle") {
        GetComponent<Rigidbody2D>().velocity = new Vector2(-1 * curVelocity.x, 0);
        curScale = transform.localScale;
        curScale.x *= -1;
        transform.localScale = curScale;
    }
    else if (c.name == "GroundCheck") {
        print("Killed By Jump!");
        Destroy(gameObject);
    }
}
```

BINUS UNIVERSITY

People
Innovation
Excellence

Let's do some script

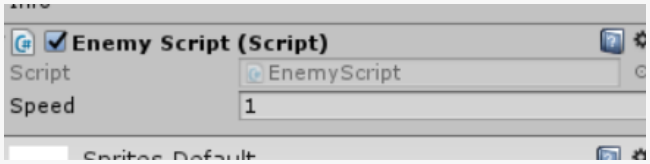
We need to create the OnTriggerEnter2D() function to detect if the enemy touched an obstacle, so it needs to change direction, or if the player killed it by jumping on it:

```
void OnTriggerEnter2D(Collider2D c) {
    if (c.tag == "Obstacle") {
        GetComponent<Rigidbody2D>().velocity = new Vector2(-1 * curVelocity.x, 0);
        curScale = transform.localScale;
        curScale.x *= -1;
        transform.localScale = curScale;
    }
    else if (c.name == "GroundCheck") {
        print("Killed By Jump!");
        Destroy(gameObject);
    }
}
```

Let's do some script

We need to do it if the enemy collides with a collider, and again, we need to check if it is an obstacle or the player. However, in this case, the player's collider is not GroundCheck, therefore, in this case, it is the enemy that subtracts a life to the player before they die

```
void OnCollisionEnter2D(Collision2D c) {
    if (c.collider.tag == "Obstacle") {
        GetComponent<Rigidbody2D>().velocity = new Vector2(-1 *curVelocity.x, 0);
        curScale = transform.localScale;
        curScale.x *= -1;
        transform.localScale = curScale;
    }
    else if (c.collider.tag == "Player") {
        c.transform.GetComponent<GameHandler>().SubtractHealth();
        Destroy(gameObject);
    }
}
```



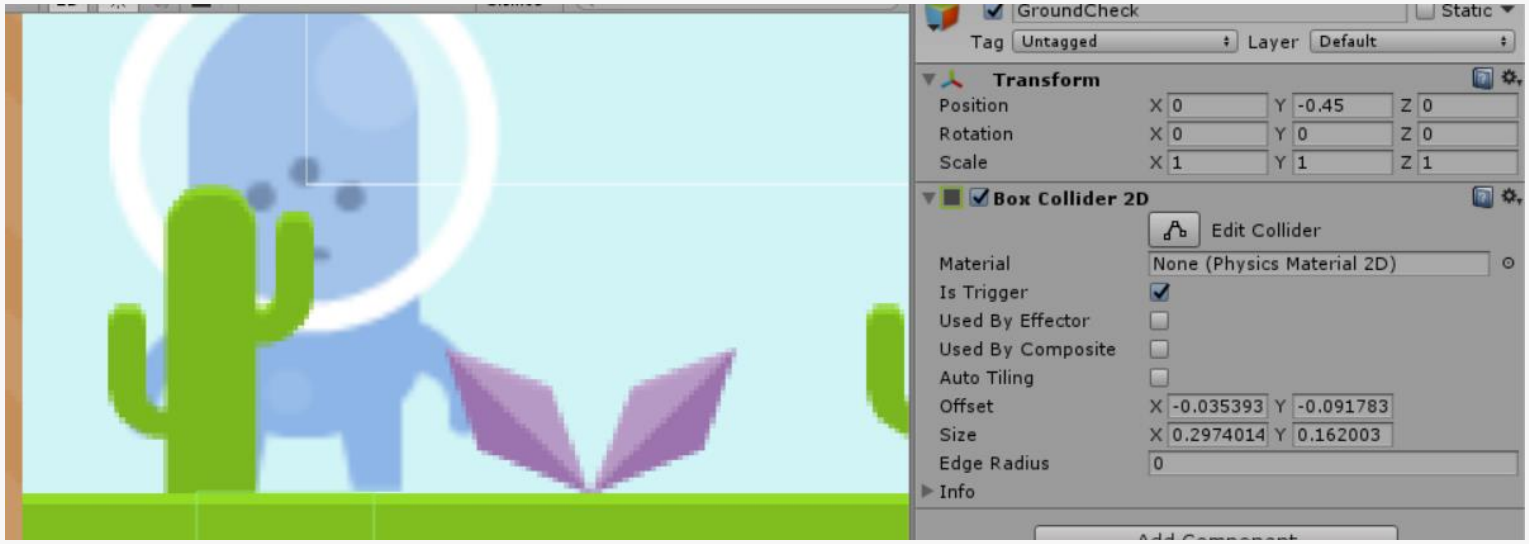
Add EnemyScript to Enemy 1 gameobject

People
Innovation
Excellence

BINUS UNIVERSITY

People
Innovation
Excellence

Edit player

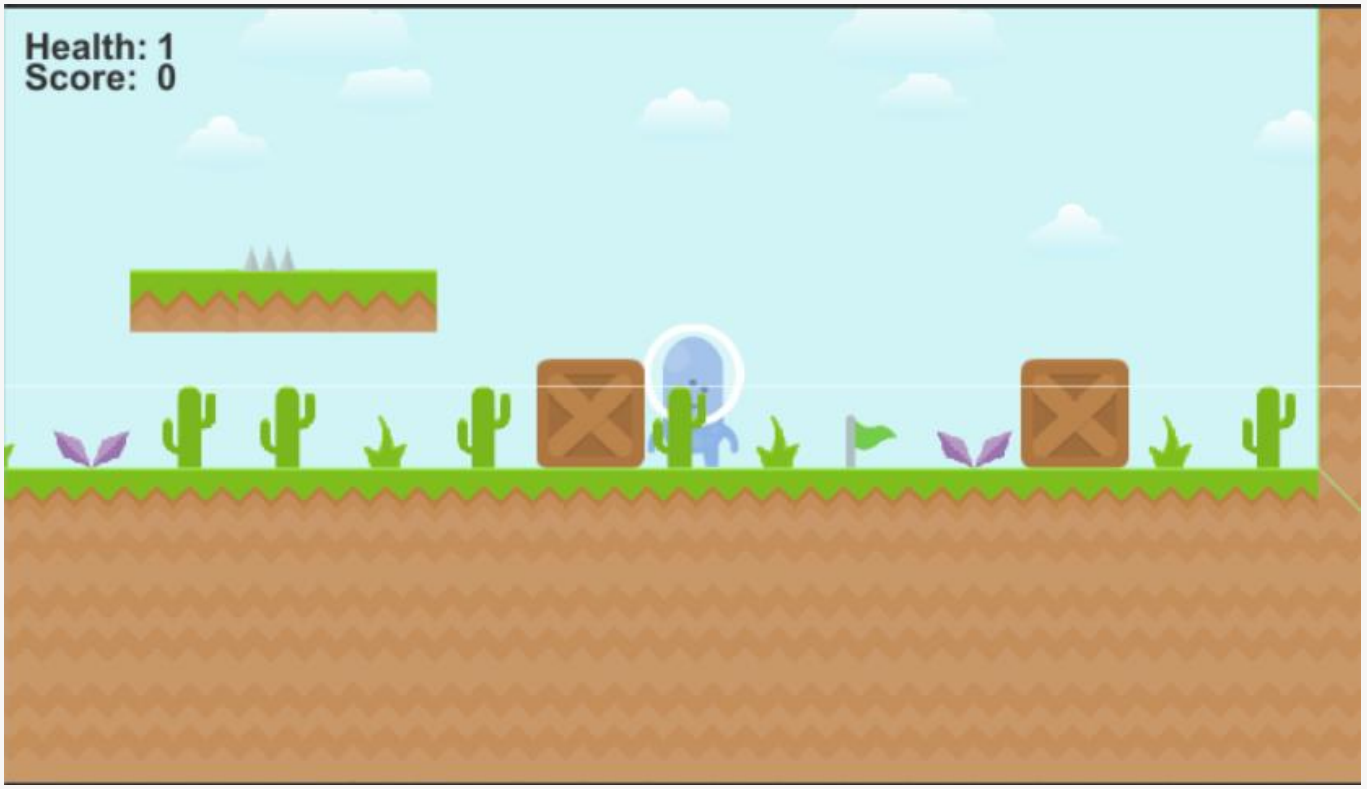


In the GroundCheck object under Player, add a collider and set its **IsTrigger** variable to true. Then, center it directly under the player

BINUS UNIVERSITY

People
Innovation
Excellence

LET'S PLAY



BINUS UNIVERSITY

Let's take a look at your prototype

- Add more enemies

People
Innovation
Excellence

BINUS UNIVERSITY

People
Innovation
Excellence

References

Freeman, J. (2015). Unity's New 2D Workflow

Vidyasagar. (2014. Unity and C#: Game Loop.CodeProject

Pereira, V. (2014). Learning Unity 2D Game Development by Example. Packt Publishing, Inc. San Francisco. ISBN: 9781783559046