KW 10 – GameMechanics (1/2)

IMPORTANT:
Please work for this class only with **Unity 2020.3.29f1 (LTS)**.

PREPARATION

Try to understand the game mechanics, level design and player movement in the following games:

1. Lunar Lander (1979): https://www.youtube.com/watch?v=McAhSoAEbhM
2. Thrust / Oids : https://www.youtube.com/watch?v=Dt44PEIWBRg
3. Space Taxi: https://www.youtube.com/watch?v=KuRyiFg6FBY

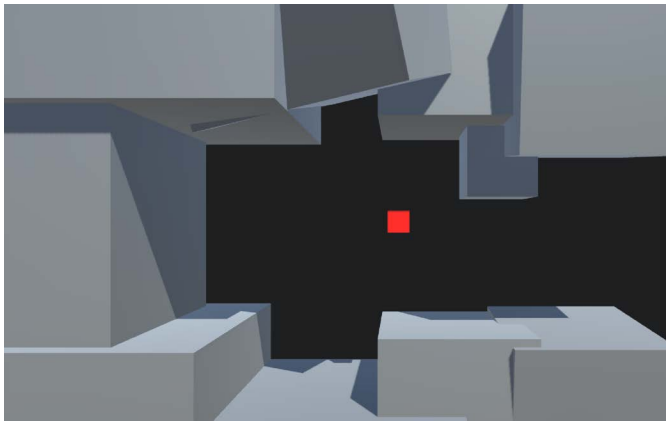
EXERCISE: ALONE IN THE CAVES

You are alone in a cave. You can control your vehicle in 2d (horizontal/vertical) but you can only add speed (horizontal/vertical). Single Screen.

If you collide somewhere the level will be reloaded and you start from the beginning. Create 1 level that gets harder (progression).

- **Visuals –** use only transformed cubes, max. 3 Colors (this exercise is not about the visuals, but the mechanics!)
- **Perspective** – The game can be Single Screen with a fixed camera or you can follow the player with camera (for this excercise just parent the camera to the player to do so).
- **Programming hints** – On the next page we give you some clues, how to solve the exercise.

Exercise submission – Screen capture the gameplay of your final game. Upload a small movie (mp4, mov) to moodle.



Your result could look like this...

Challenges (Extra!)

- Add a constant gravitation
- Add distortion fields (like wind etc.)
- Triggers (Gates, Pick-ups?)

KW 10 – GameMechanics (2/2)

PROGRAMMING HINTS

a. Create cube primitves in the hierarchy, use the transform tools to scale and position the cubes. Build a level with cubes.

b. Create a cube for the player and name it 'Player'

   1. Add a component 'Rigidbody' to the player game object (Use Gravity = false; Is Kinematic = false)
   2. (optional) Material: Create a new Material in project view (Assets). Add the material on the Player in the component Mesh Renderer.

c. Add new Script to Player

   1. GetComponent<Rigidbody().
   2. Get Input (WASD/Arrow-Keys)
   3. Rigidbody.MovePosition()
   4. void OnCollisionEnter()
   5. reload Scene on Collison -

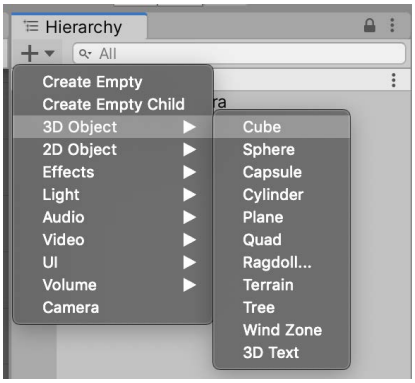
References

- Unity Refrences: https://docs.unity3d.com/ScriptReference/Rigidbody.MovePosition.html
- https://docs.unity3d.com/ScriptReference/Collider.OnCollisionEnter.html
- https://docs.unity3d.com/ScriptReference/SceneManagement.SceneManager.html

important for Scene reload

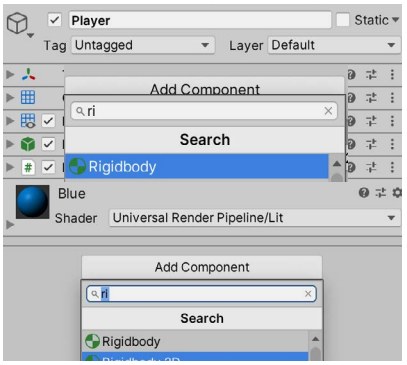
```
using System.Collections;
using System.Collections.Generic;
using UnityEngine;
using UnityEngine.SceneManagement;

0 references
public class PlayerMovement : MonoBehaviour
{
    1 reference
    public float speed = 6.0f;
    2 references
    private Rigidbody rb;
    3 references
    private Vector3 moveDirection = Vector3.zero;

    0 references
    void Start()
    {
        rb = GetComponent<Rigidbody>();
    }

    0 references
    void Update()
    {
        // get input
        moveDirection = new Vector3(Input.GetAxis("Horizontal"), Input.GetAxis("Vertical"), 0.0f);
        moveDirection *= speed;

        // move rb from input
        rb.MovePosition(transform.position + moveDirection * Time.deltaTime);
    }

    0 references
    void OnCollisionEnter(Collision collision)
    {
        // get and reload active scene
        Scene scene = SceneManager.GetActiveScene();
        Debug.Log("Active Scene name is: " + scene.name + "\nActive Scene index: " + scene.buildIndex);
        SceneManager.LoadScene(scene.buildIndex);
    }
}
```

Basic Player Movement Script.

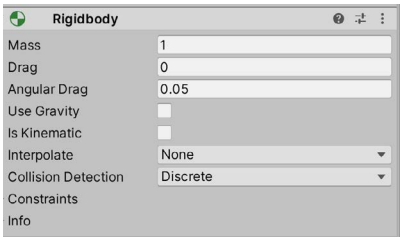


Create Primitives

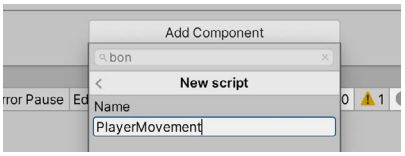
Transform Tools



Add Rigidbody



Configurate Rigidbody



Add new script