

3D Game development:

The Jumping Dabouza

Association Science And Technology Ben Arous

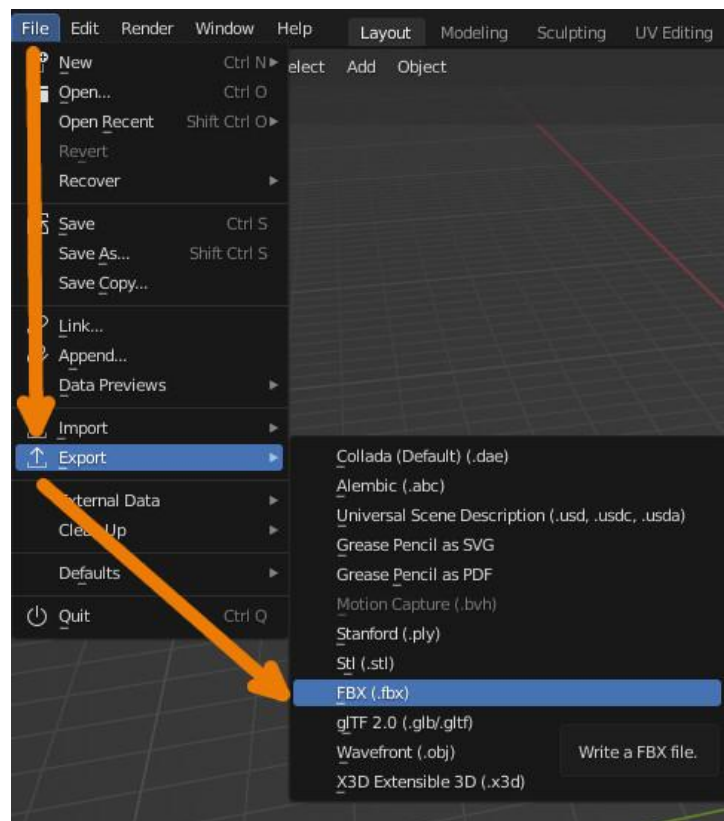
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Intro: the game is simple consisting of 2 planes. Everytime the Dabouza jumps from one to another it scores 1 point.

Task 1: Creating a 3D model & exporting it: (/30pts)

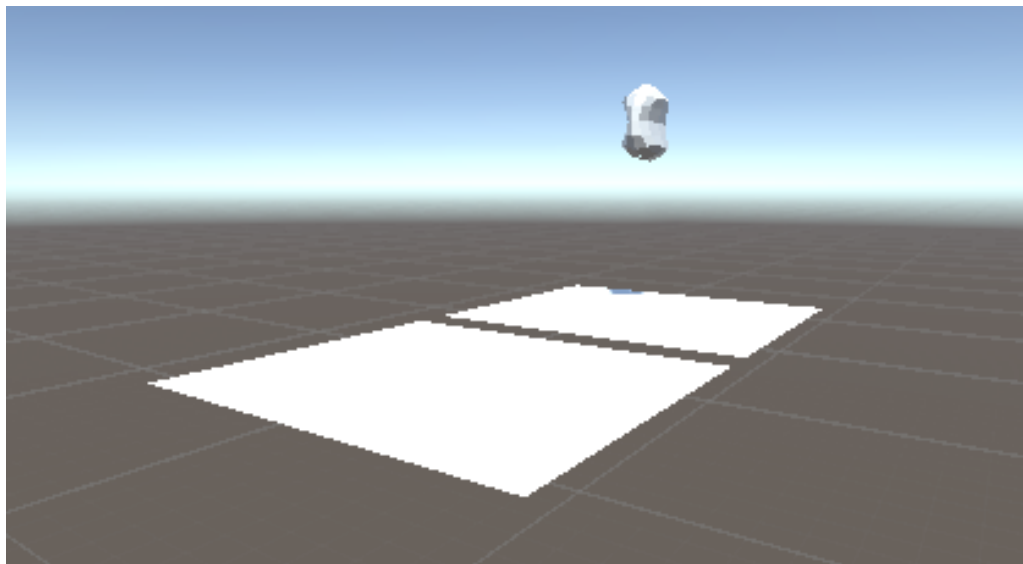
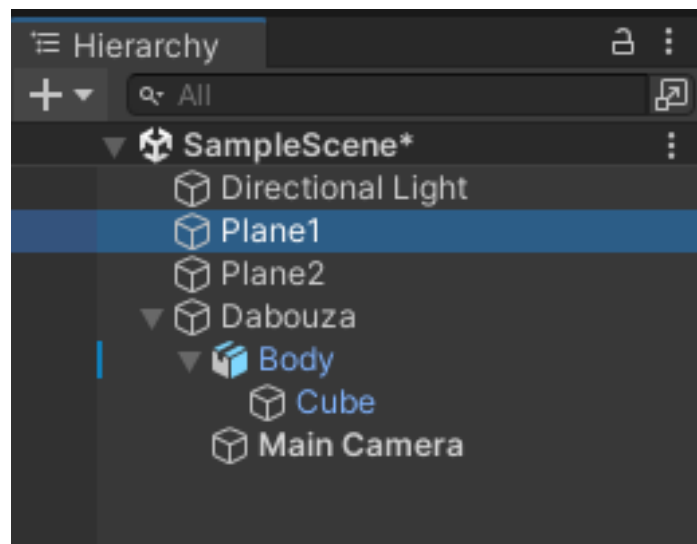
step 1 : in Blender, create the 3D object.

step 2 : export The File as FBX :



Task 2: Creating our GameObjects and adding some components To Them : (/40pts)

-By the end you should obtain something that looks like this :



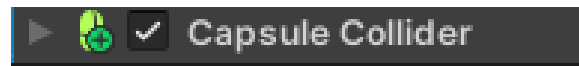
-Now let's add some Physics to the GameObject named 'Body':

By adding a Rigidbody component.



-and add a Collider too, to the GameObject named 'Body':

[wa3lech??](#) : So that the Body does not go Through the Planes
how have each a 'collider' component (a 'Collider' can't go through
another 'Collider')



—Time to test what we have just learnt—

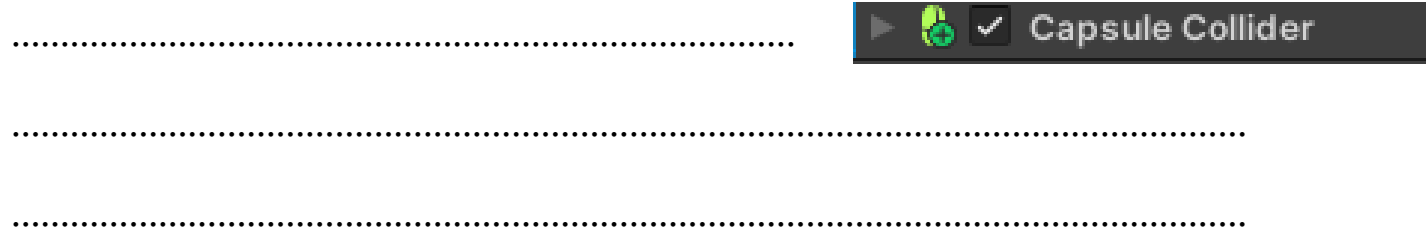
Q1: Ely fel taswira chnoua wchnoua ya3mel: (/10)

.....  Rigidbody

.....

.....

Q2: Ely fel taswira chnoua wchnoua ya3mel:(/10)



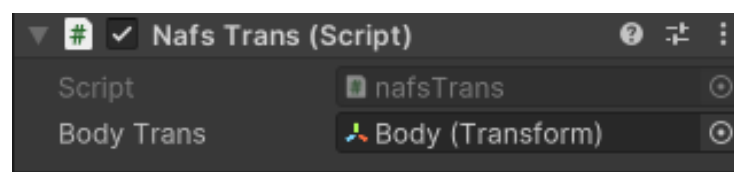
Task 3: 'Merging' the camera with the Dabouza
& moving the camera with the mouse changing the
dabouza's direction :

(/40pts)

'Merging' the camera with the Dabouza: In unity's language this means:
To make The Dabouza and The camera have the same position.

wkifech?? :

Just add a script component to the camera GameObject and
name it whatever you want

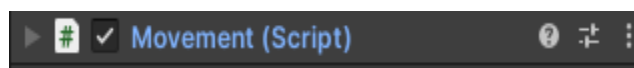


The script :

```
1  using System.Collections;
2  using System.Collections.Generic;
3  using UnityEngine;
4
5  Unity Script (1 asset reference) | 0 references
6  public class nafsTrans : MonoBehaviour
7  {
8      public Transform BodyTrans;
9
10     Unity Message | 0 references
11     void Update()
12     {
13         // position = position mte3 el dabouza
14         transform.position = BodyTrans.position;
15     }
16 }
```

Now to move the camera with the mouse we should read the mouse input and move the camera **proportionally**.

So we add a script component to the camera GameObject.



The script :

```
1  using System.Collections;
2  using System.Collections.Generic;
3  using UnityEngine;
4
5  Unity Script | 0 references
6  public class movement : MonoBehaviour
7  {
8      public float sensX;
9      public float sensY;
10
11     public Transform BodyOrientation;
12
13     float xRotation;
14     float yRotation;
15     Unity Message | 0 references
16     void Start()
17     {
18         Cursor.lockState = CursorLockMode.Locked;//locked at the center of the screen
19         Cursor.visible = false;//invisible
20
21     }
22
23     // Update is called once per frame
24     Unity Message | 0 references
25     void Update()
26     {
27         //calculate the rotation
28         float mouseX = Input.GetAxisRaw("Mouse Y") * Time.deltaTime * sensX;
29         xRotation -= mouseX;
30         float mouseY = Input.GetAxisRaw("Mouse X") * Time.deltaTime * sensY;
31         yRotation += mouseY;
32
33         //Lezem -90<xRotation<90
34         xRotation = Mathf.Clamp(xRotation, -90f, 90f);// xRotation matfoutech 90° lfou9 wala louta
35
36         // apply the rotation
37         transform.rotation = Quaternion.Euler(xRotation, yRotation, 0);
38         BodyOrientation.rotation = Quaternion.Euler(0, yRotation, 0);
39     }
40 }
```

Task 4: Moving the Dabouza and making it Jump: (/40pts)

To do that we add a script to the Body Game object

```
1 using System.Collections;
2 using System.Collections.Generic;
3 using UnityEngine;
4 using TMPro;
5
6 [Unity Script (1 asset reference) | 0 references]
7 public class DabouzaMovement : MonoBehaviour
8 {
9     [Header("Movement")]
10     public float moveSpeed;
11     public float groundDrag;
12     public float jumpForce;
13     public float jumpCooldown;
14
15     bool readyToJump;
16
17     [Header("Keybinds")]
18     public KeyCode jumpKey = KeyCode.Space;
19
20     [Header("Ground Check")]
21     public float playerHeight;
22     public LayerMask whatIsGround;
23
24     bool grounded;
25
26     public Transform orientation;
27
28     float horizontalInput;
29     float verticalInput;
30
31     Vector3 moveDirection;
32
33     Rigidbody rb;
34
35     [Unity Message | 0 references]
36     private void Start()
37     {
38         rb = GetComponent<Rigidbody>();
39         rb.freezeRotation = true;
40
41         readyToJump = true;
42     }
43
44     [Unity Message | 0 references]
45     private void Update()
46     {
47         // ground check
48         grounded = Physics.Raycast(*P1*/transform.position,
49                                     /*P2*/ Vector3.down, /*P3*/ playerHeight * 0.5f + 0.3f, /*P4*/ whatIsGround);
50         //Translation : eb3ath rayon "5ayeli / wahmi" chouf to3rdhouchi P4
51         //P : parametre
52         //P1: men point P2:fy etijeh P3: Toul el rayon
53         MyInput();
54
55         if (grounded)
56             rb.drag = groundDrag;
57         else
58             rb.drag = 0;
59     }
60
61     [Unity Message | 0 references]
62     private void FixedUpdate()// Gets executed in every 0.02
63     {
64         MovePlayer();
65     }
66
67     1 reference
68     private void MyInput()
69     {
70         horizontalInput = Input.GetAxisRaw("Horizontal");
71         verticalInput = Input.GetAxisRaw("Vertical");
72     }
73 }
```

.....

Questions:(/40)

1/ Match each Line of code with its equivalent: (/20)

```
[Header("Movement")]
public float moveSpeed;
public float groundDrag;
public float jumpForce;
public float jumpCooldown;

bool readyToJump;
```



1/ Explain how the method 'Raycast' work: (/20)

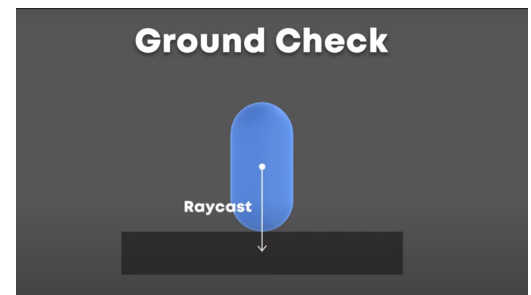
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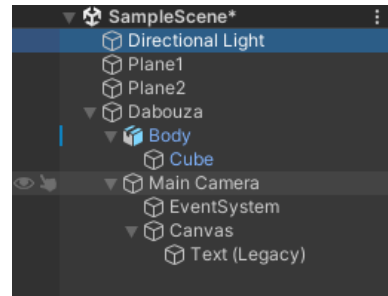
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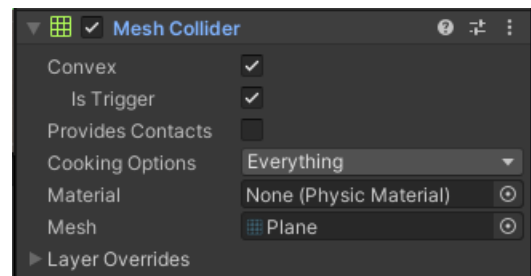


Task 5: Let's add a score to our game: (/40pts)

- 1) First Let's add a Text game object
to The main camera / camera :



- 2) Afterwards, we should add a “mesh collider”
component to each of the planes
and activate the “**Is Trigger**” property:



- 3) Now we should add some code That gets executed every time a plane gets
triggered which means : another mesh collider hits a plane:

Now where do you think we should add this code and how will we do that:

(/20)

.....

.....

.....

The script:

```
1  using System.Collections;
2  using System.Collections.Generic;
3  using UnityEngine;
4  using UnityEngine.UI;
5
6  public class TextInc : MonoBehaviour
7  {
8      public Text scoreText;
9      int score;
10     void OnTriggerEnter(Collider other)
11     {
12         score = int.Parse(scoreText.text);
13         score++;
14         scoreText.text = score.ToString();
15     }
16 }
```

To increment (add +1 to) the score we have gone through 3 steps, express them : (/30)

- 1).....
- 2).....
- 3).....

Enjoy! 😊