Kishinchand Chellaram College, Mumbai – 20.

FY/SY /TY B. Sc. (I. T) Semester_____

Practical 1

Aim: Write a C# script for implementing virtual environment for making an object jump.

Steps:

Step No.	Step
1.	Open Unity3D
2.	Click on New Project --> Select 'All Templates' --> Select 3D Core --> Give a Project Name --> Click on Create Project
3.	Double Click on the Project Created
4.	Select Game Object --> 3D Object --> Plane
5.	Select Game Object --> 3D Object --> Sphere
6.	Now Click on 'Add Component' --> Select 'Rigid Body'
7.	Now Click on 'Add Component' --> Type a new name --> Select Script --> Select Create and Add
8.	Double Click on the Script File Created

9.	Type the code in the file that opens:
	`using System.Collections;`
	`using System.Collections.Generic;`
	`using UnityEngine;`
	`public class Sample : MonoBehaviour`
	`{`
	`  //Rigidbody rb;`
	`  Rigidbody rb2;`
	`  // Start is called before the first frame update`
	`  void Start()`
	`  {`
	`  //  rb = gameObject.GetComponent<Rigidbody>();`
	`  rb2 = gameObject.GetComponent<Rigidbody>();`
	`  }`
	`  // Update is called once per frame`
	`  void Update()`
	`  {`
	`  if(Input.GetKeyDown(KeyCode.Space))`
	`  {`
	`  rb2.AddForce(Vector3.up * 10,ForceMode.Impulse);`
	`  }`
	`  }`
	`}`

10.	Save and Go Back TO Unity3D
11.	Click on the 'Green Play Button' or 'Run'

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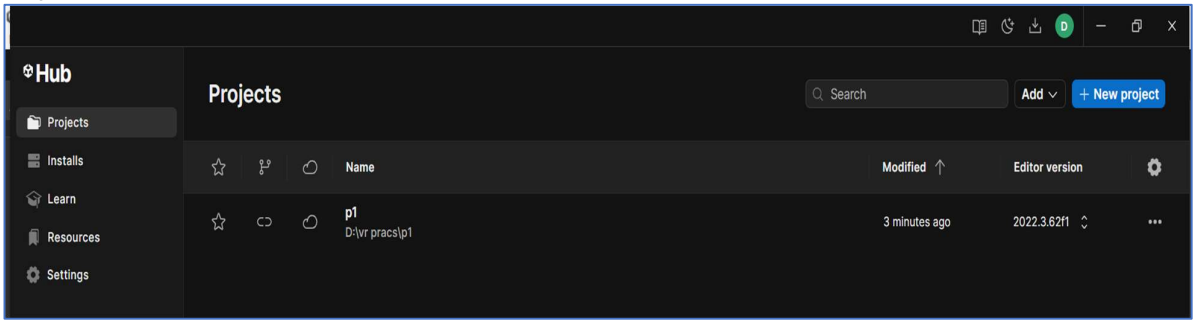
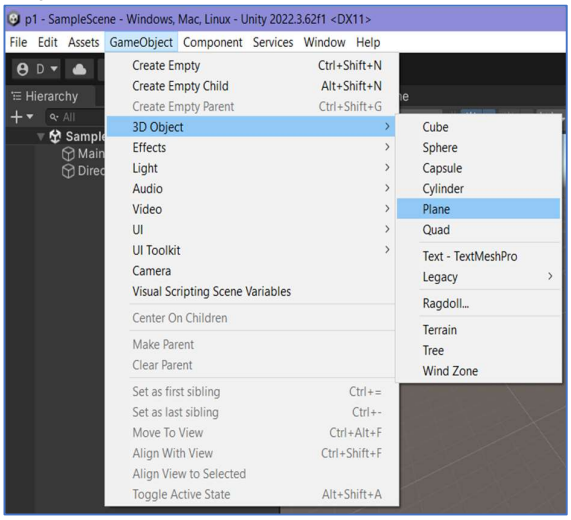
Screenshots:

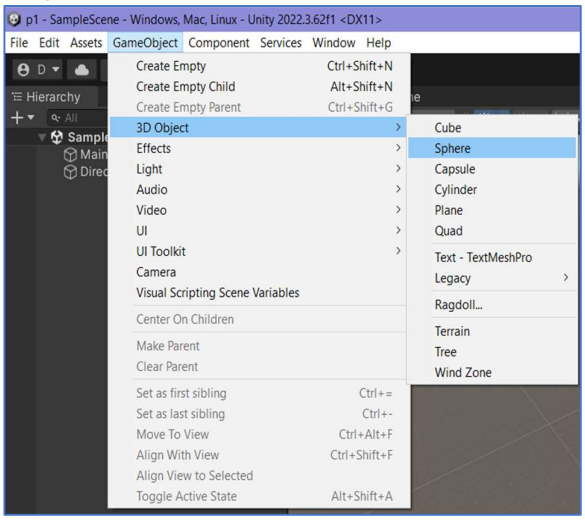
Step 1 to 3



Step 4



Step 5



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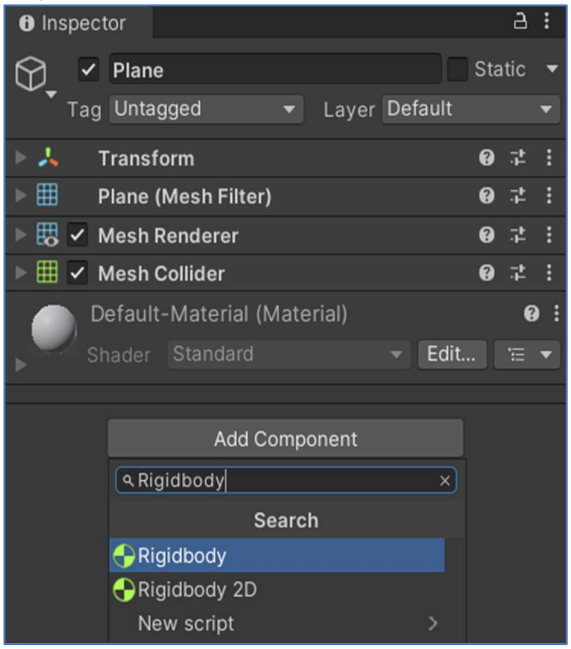

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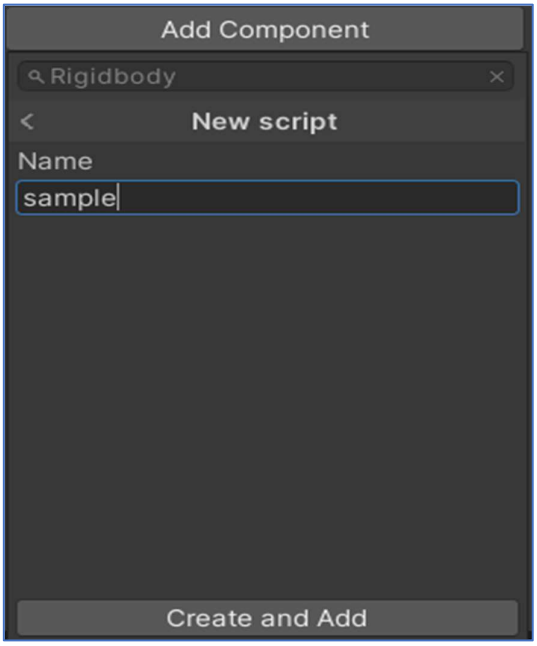

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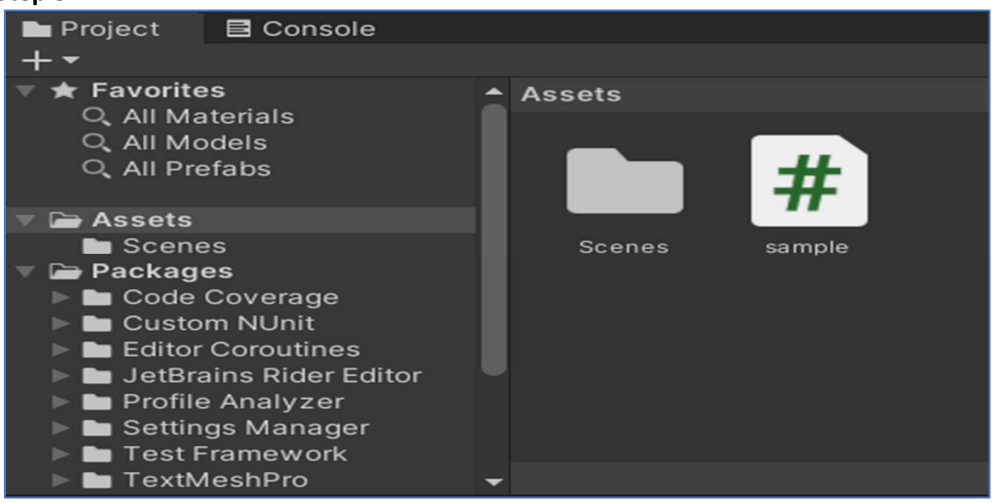
Step 8



Step 9:

C# Code

```
using System.Collections;
using System.Collections.Generic;
using UnityEngine;
public class Sample : MonoBehaviour
{
   //Rigidbody rb;
   Rigidbody rb2;
   // Start is called before the first frame update
   void Start()
   {
     //  rb = gameObject.GetComponent<Rigidbody>();
       rb2 = gameObject.GetComponent<Rigidbody>();
   }
   // Update is called once per frame
   void Update()
   {
      if(Input.GetKeyDown(KeyCode.Space))
      {
         rb2.AddForce(Vector3.up * 10,ForceMode.Impulse);
      }
   }
}
```

Step 10: Run the file in Unity3D and see the output.

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Practical 2

Aim: Write a C# script for implementing virtual environment for moving and making the object jump

Steps:

Step No.	Step
1.	Open Unity3D
2.	Click on New Project --> Select 'All Templates' --> Select 3D Core --> Give a Project Name --> Click on Create Project
3.	Double Click on the Project Created
4.	Select Game Object --> 3D Object --> Plane
5.	Select Game Object --> 3D Object --> Sphere
6.	Now Click on 'Add Component' --> Select 'Rigid Body'
7.	Now Click on 'Add Component' --> Type a new name --> Select Script --> Select Create and Add
8.	Double Click on the Script File Created

9.	Type the code in the file that opens:
	`using System.Collections;`
	`using System.Collections.Generic;`
	`using Unity.VisualScripting;`
	`using UnityEngine;`
	`public class Movement : MonoBehaviour`
	`{`
	`  Rigidbody rb2;`
	`  public float speed = 0.1f;`
	`  // Start is called before the first frame update`
	`  void Start()`
	`  {`
	`  rb2 = gameObject.GetComponent<Rigidbody>();`
	`  }`
	`  // Update is called once per frame`
	`  void Update()`
	`  {`
	`  if (Input.GetKey(KeyCode.RightArrow))`
	`  {`
	`  transform.Translate(50f * speed * Time.deltaTime, 0, 0);`
	`  }`
	`  else if (Input.GetKey(KeyCode.LeftArrow))`
	`  {`
	`  transform.Translate(-50f * speed * Time.deltaTime, 0, 0);`
	`  }`
	`  else if (Input.GetKeyDown(KeyCode.Space))`
	`  {`
	`  rb2.AddForce(Vector3.up * 5, ForceMode.Impulse);`
	`  }`
	`  }`
	`}`

10.	Save and Go Back TO Unity3D
11.	Click on the 'Green Play Button' or 'Run'

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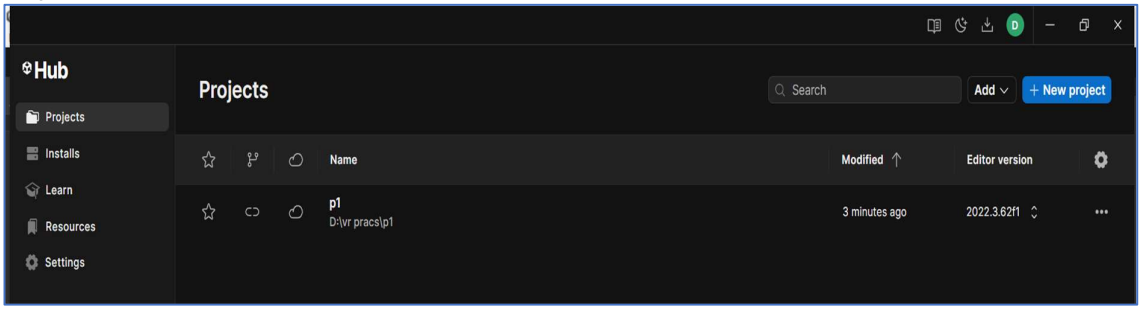
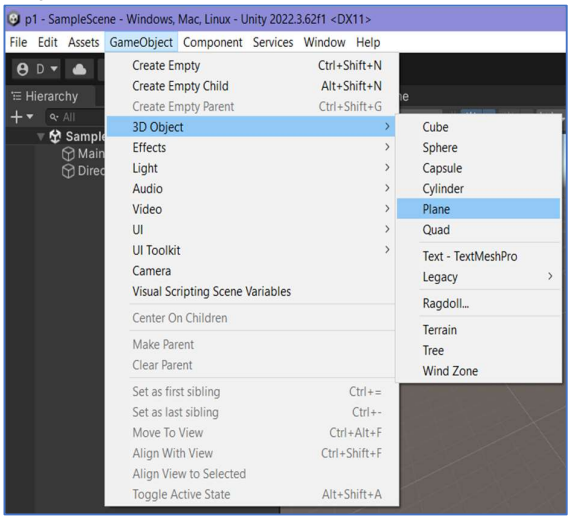
Screenshots:

Step 1 to 3



Step 4



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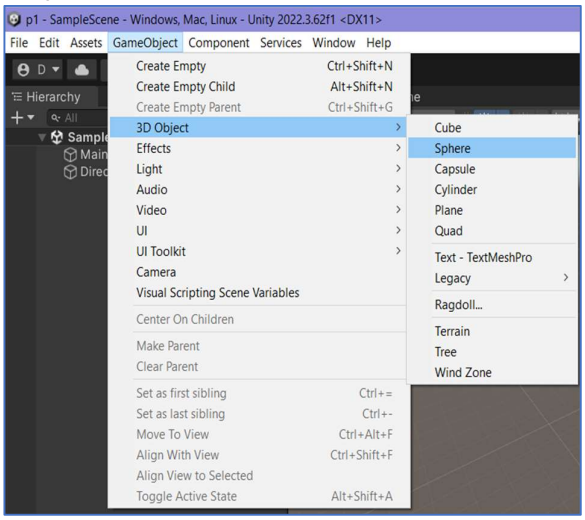

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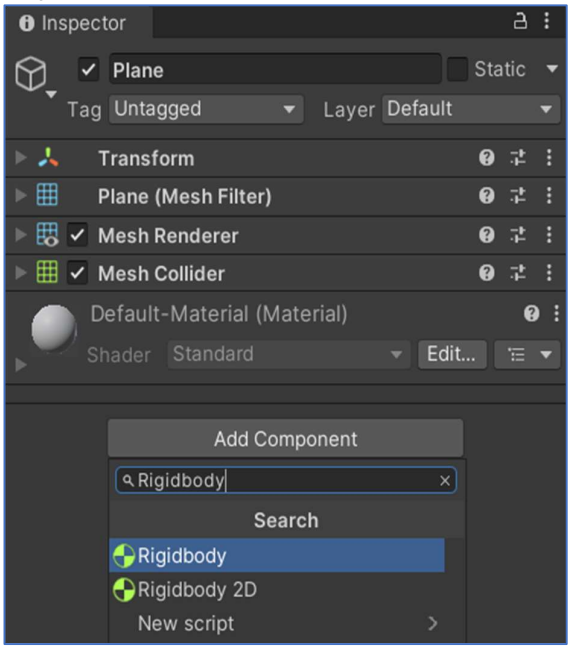

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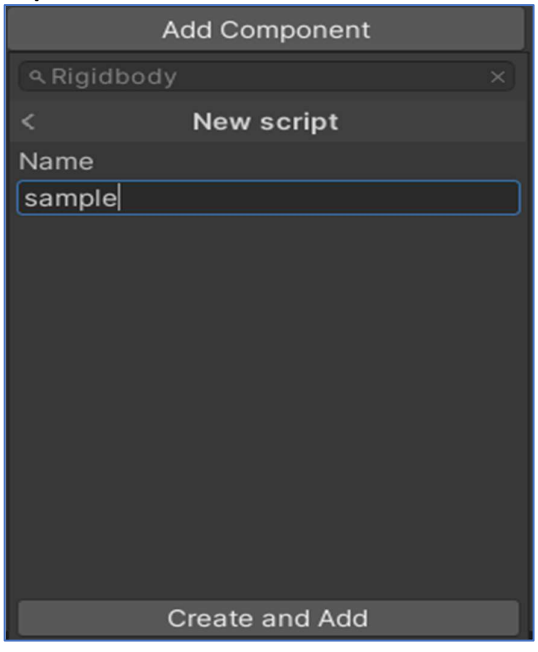

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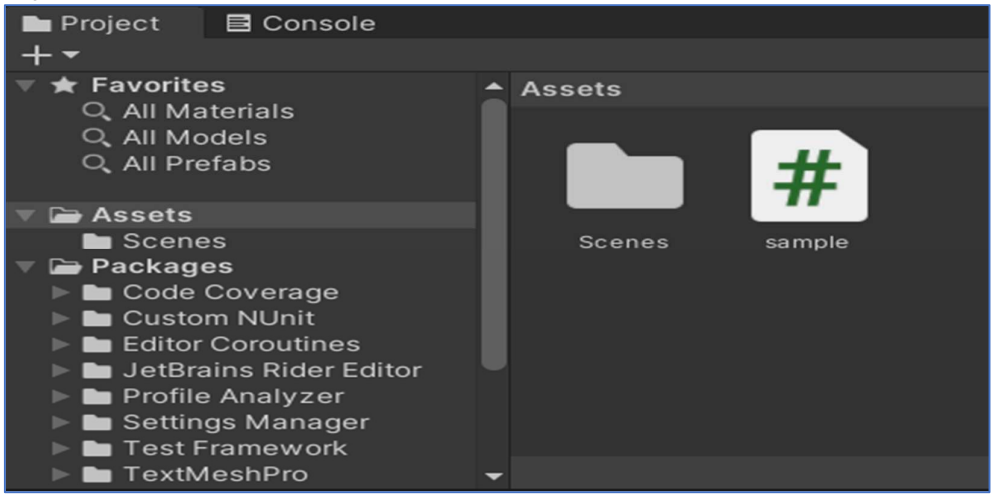
Step 8



Step 9:

C# Code

```
using System.Collections;
using System.Collections.Generic;
using Unity.VisualScripting;
using UnityEngine;
public class Movement : MonoBehaviour
{
   Rigidbody rb2;
   public float speed = 0.1f;
   // Start is called before the first frame update
   void Start()
   {
      rb2 = gameObject.GetComponent<Rigidbody>();
   }
   // Update is called once per frame
   void Update()
   {
      if (Input.GetKey(KeyCode.RightArrow))
      {
         transform.Translate(50f * speed * Time.deltaTime, 0, 0);
      }
      else if (Input.GetKey(KeyCode.LeftArrow))
      {
         transform.Translate(-50f * speed * Time.deltaTime, 0, 0);
      }
      else if (Input.GetKeyDown(KeyCode.Space))
      {
         rb2.AddForce(Vector3.up * 5, ForceMode.Impulse);
      }
   }
}
```

Step 10: Run the file in Unity3D and see the output.

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Practical 3

Aim: Write a C# script for implementing virtual environment for moving the object in all directions.

Steps:

Step No.	Step
1.	Open Unity3D
2.	Click on New Project --> Select 'All Templates' --> Select 3D Core --> Give a Project Name --> Click on Create Project
3.	Double Click on the Project Created
4.	Select Game Object --> 3D Object --> Plane
5.	Select Game Object --> 3D Object --> Sphere
6.	Now Click on 'Add Component' --> Select 'Rigid Body'
7.	Now Click on 'Add Component' --> Type a new name --> Select Script --> Select Create and Add
8.	Double Click on the Script File Created

9.	Type the code in the file that opens:
	`using System.Collections;`
	`using System.Collections.Generic;`
	`using Unity.VisualScripting;`
	`using UnityEngine;`
	`public class Movement : MonoBehaviour`
	`{`
	`Rigidbody rb2;`
	`public float speed = 2f;`
	`// Start is called before the first frame update`
	`void Start()`
	`{`
	`rb2 = gameObject.GetComponent<Rigidbody>();`
	`}`
	`// Update is called once per frame`
	`void Update()`
	`{`
	`if (Input.GetKey(KeyCode.RightArrow))`
	`{`
	`transform.Translate(50f * speed * Time.deltaTime, 0, 0);`
	`}`
	`else if (Input.GetKey(KeyCode.LeftArrow))`
	`{`
	`transform.Translate(-50f * speed * Time.deltaTime, 0, 0);`
	`}`
	`else if (Input.GetKeyDown(KeyCode.Space))`
	`{`
	`rb2.AddForce(Vector3.up * 5, ForceMode.Impulse);`
	`}`
	`else if (Input.GetKey(KeyCode.DownArrow))`
	`{`
	`transform.Translate(Vector3.forward * Time.deltaTime);`
	`}`
	`else if (Input.GetKey(KeyCode.UpArrow))`
	`{`
	`this.transform.Translate(Vector3.back * Time.deltaTime);`
	`}`
	`}`

	}
10.	Save and Go Back TO Unity3D
11.	Click on the 'Green Play Button' or 'Run'

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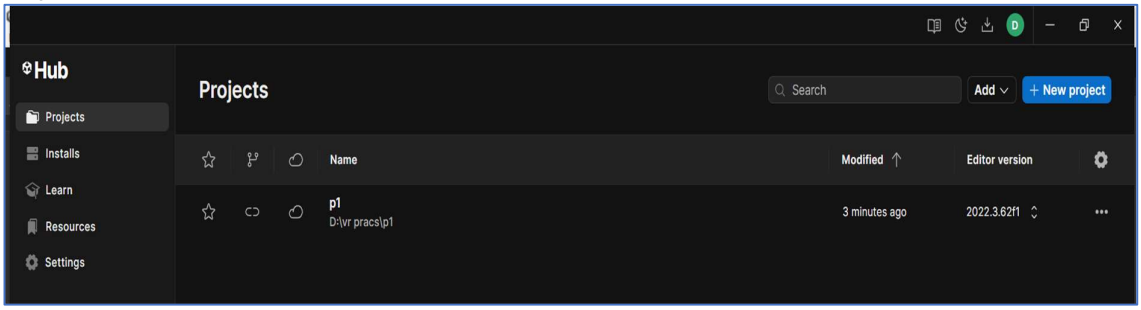
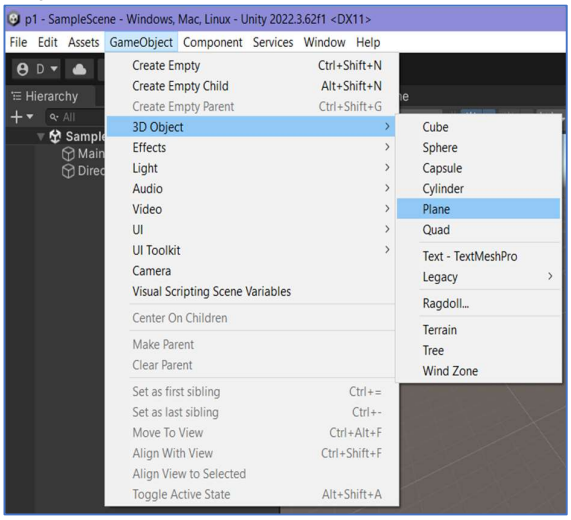
Screenshots:

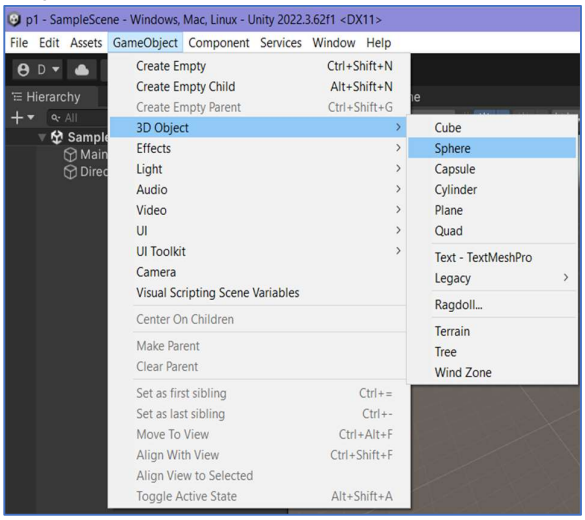
Step 1 to 3



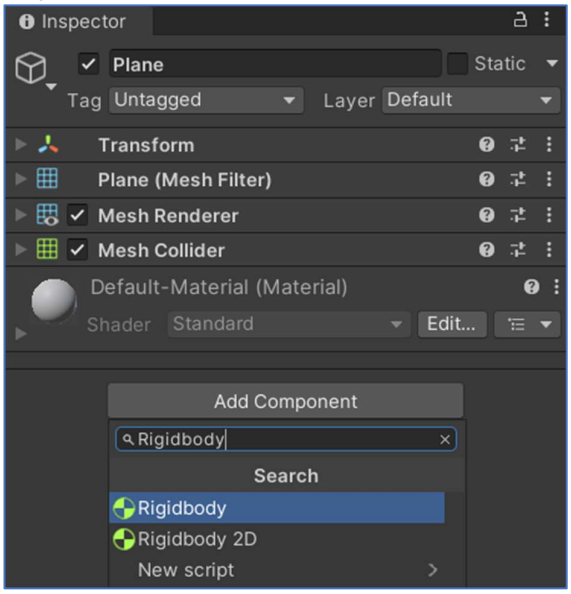
Step 4



Step 5



Step 6



Step 7

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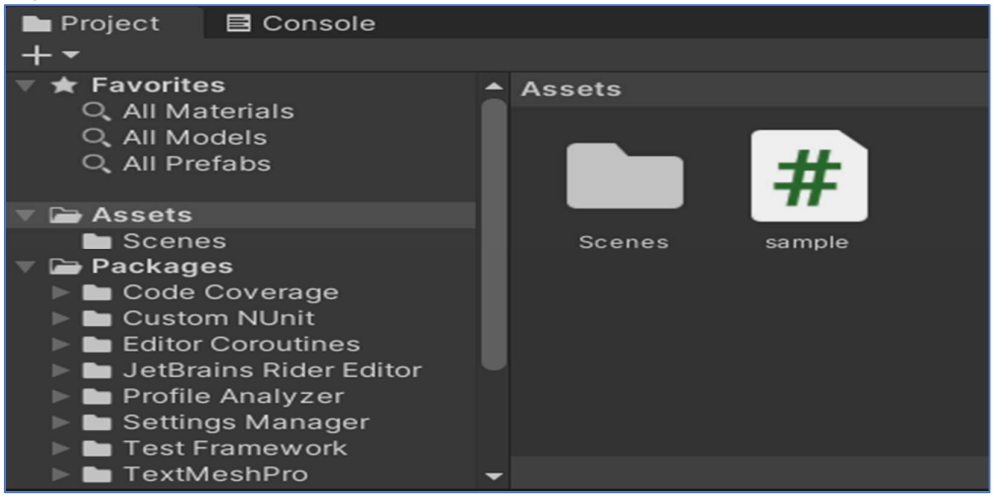
Step 8



Step 9:

C# Code

```
using System.Collections;
using System.Collections.Generic;
using Unity.VisualScripting;
using UnityEngine;
public class Movement : MonoBehaviour
{
   Rigidbody rb2;
   public float speed = 2f;
   // Start is called before the first frame update
   void Start()
   {
     rb2 = gameObject.GetComponent<Rigidbody>();
   }
   // Update is called once per frame
   void Update()
   {
      if (Input.GetKey(KeyCode.RightArrow))
      {
         transform.Translate(50f * speed * Time.deltaTime, 0, 0);
      }
      else if (Input.GetKey(KeyCode.LeftArrow))
      {
         transform.Translate(-50f * speed * Time.deltaTime, 0, 0);
      }
      else if (Input.GetKeyDown(KeyCode.Space))
      {
       rb2.AddForce(Vector3.up * 5, ForceMode.Impulse);
      }
      else if (Input.GetKey(KeyCode.DownArrow))
      {
         transform.Translate(Vector3.forward * Time.deltaTime);
      }
      else if (Input.GetKey(KeyCode.UpArrow))
      {
         this.transform.Translate(Vector3.back * Time.deltaTime);
      }
   }
}
```

Step 10: Run the file in Unity3D and see the output.

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Practical 4

Aim: Write a C# script for implementing virtual environment for color changer.

Steps:

Step No.	Step
1.	Open Unity3D
2.	Click on New Project --> Select 'All Templates' --> Select 3D Core --> Give a Project Name --> Click on Create Project
3.	Double Click on the Project Created
4.	Select Game Object --> 3D Object --> Plane
5.	Select Game Object --> 3D Object --> Sphere
6.	Now Click on 'Add Component' --> Select 'Rigid Body'
7.	Now Click on 'Add Component' --> Type a new name --> Select Script --> Select Create and Add
8.	Double Click on the Script File Created

9.	Type the code in the file that opens:
	`using System.Collections;`
	`using System.Collections.Generic;`
	`using UnityEngine;`
	`public class colourchanger : MonoBehaviour`
	`{`
	`  // Start is called before the first frame update`
	`  void Start()`
	`  {`
	
	`  }`
	`  // Update is called once per frame`
	`  void Update()`
	`  {`
	`  if (Input.GetKey(KeyCode.R))`
	`  {`
	`  GetComponent<Renderer>().material.color = Color.red;`
	`  }`
	`  if (Input.GetKey(KeyCode.B))`
	`  {`
	`  GetComponent<Renderer>().material.color = Color.blue;`
	`  }`
	`  if (Input.GetKey(KeyCode.Y))`
	`  {`
	`  GetComponent<Renderer>().material.color = Color.yellow;`
	`  }`
	`  if (Input.GetKey(KeyCode.G))`
	`  {`
	`  GetComponent<Renderer>().material.color = Color.green;`
	`  }`
	`  }`
	`}`

10.	Save and Go Back TO Unity3D
11.	Click on the 'Green Play Button' or 'Run'

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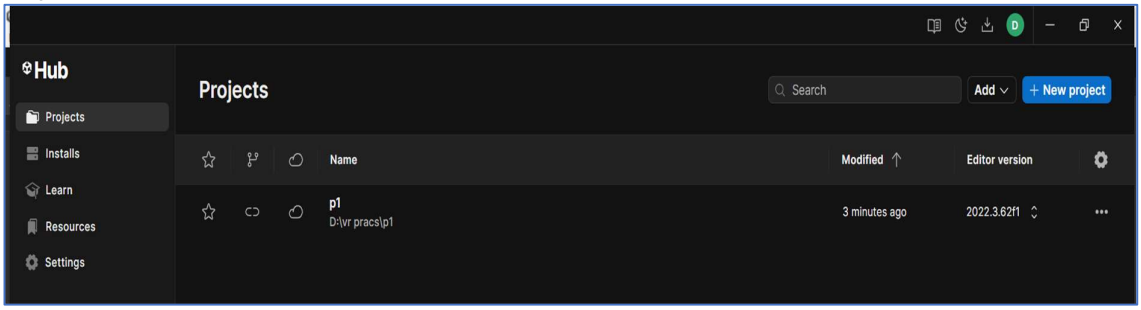
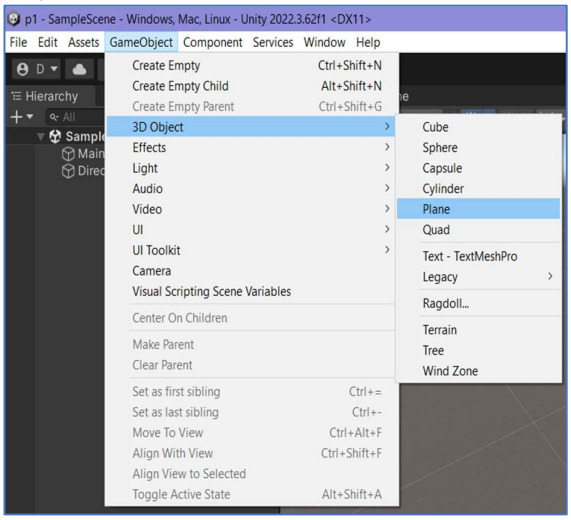
Screenshots:

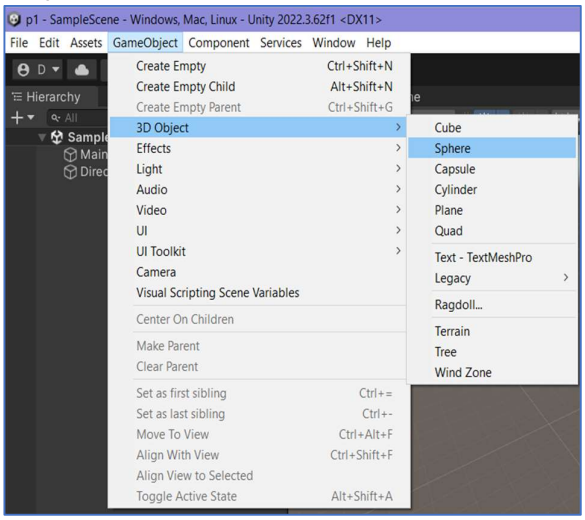
Step 1 to 3



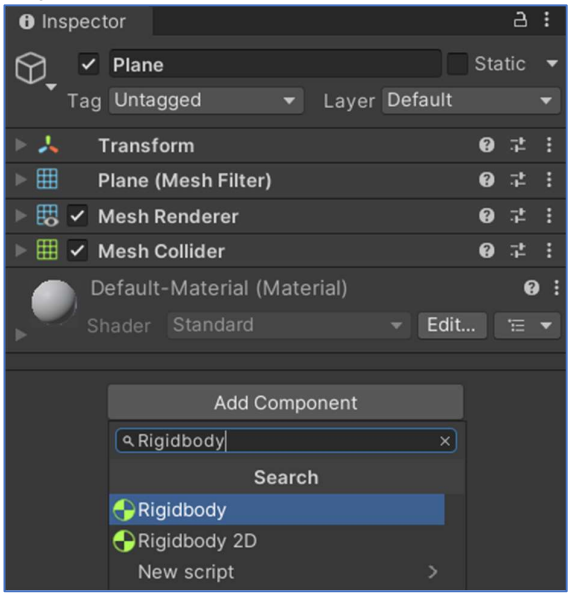
Step 4



Step 5



Step 6



Step 7

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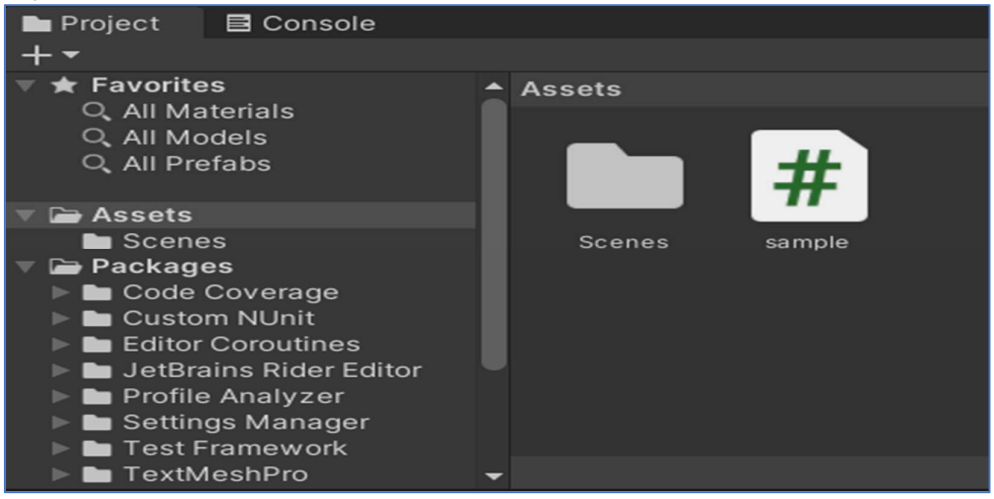
Step 8



Step 9:

C# code

```
using System.Collections;
using System.Collections.Generic;
using UnityEngine;
public class colourchanger : MonoBehaviour
{
   // Start is called before the first frame update
   void Start()
   {

   }
   // Update is called once per frame
   void Update()
   {
      if (Input.GetKey(KeyCode.R))
      {
         GetComponent<Renderer>().material.color = Color.red;
      }
      if (Input.GetKey(KeyCode.B))
      {
         GetComponent<Renderer>().material.color = Color.blue;
      }
      if (Input.GetKey(KeyCode.Y))
      {
         GetComponent<Renderer>().material.color = Color.yellow;
      }
      if (Input.GetKey(KeyCode.G))
      {
         GetComponent<Renderer>().material.color = Color.green;
      }
   }
}
```

Step 10: Run the file in Unity3D and see the output.

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Practical 5

Aim: Write a C# script for implementing virtual environment for color randomizer.

Steps:

Step No.	Step
1.	Open Unity3D
2.	Click on New Project --> Select 'All Templates' --> Select 3D Core --> Give a Project Name --> Click on Create Project
3.	Double Click on the Project Created
4.	Select Game Object --> 3D Object --> Plane
5.	Select Game Object --> 3D Object --> Sphere
6.	Now Click on 'Add Component' --> Select 'Rigid Body'
7.	Now Click on 'Add Component' --> Type a new name --> Select Script --> Select Create and Add
8.	Double Click on the Script File Created

9.	Type the code in the file that opens:
	`using System.Collections;`
	`using System.Collections.Generic;`
	`using UnityEngine;`
	`public class ColorRandomizer : MonoBehaviour`
	`{`
	`public float speed = 5f;`
	`// Start is called before the first frame update`
	`void Start()`
	`{`
	`}`
	`// Update is called once per frame`
	`void Update()`
	`{`
	`float h = Input.GetAxis("Horizontal");`
	`float v = Input.GetAxis("Vertical");`
	`transform.Translate(h * speed * Time.deltaTime, v * speed * Time.deltaTime, 0);`
	`if (Input.GetKey(KeyCode.Space))`
	`{`
	`GetComponent<Renderer>().material.color = Random.ColorHSV(0f, 1f, 1f, 1f, 0.5f, 1f);`
	`}`
	`}`
	`}`

10.	Save and Go Back TO Unity3D
11.	Click on the 'Green Play Button' or 'Run'

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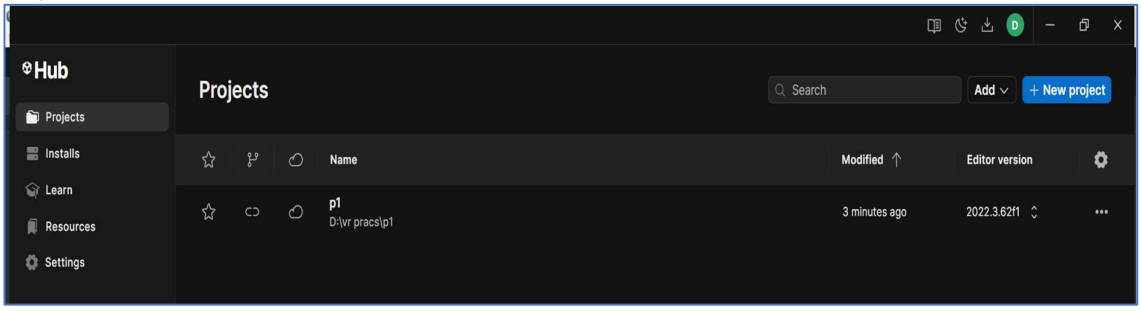
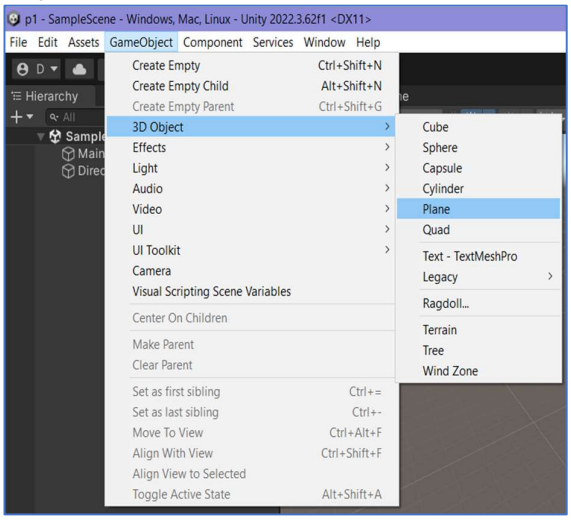
Screenshots:

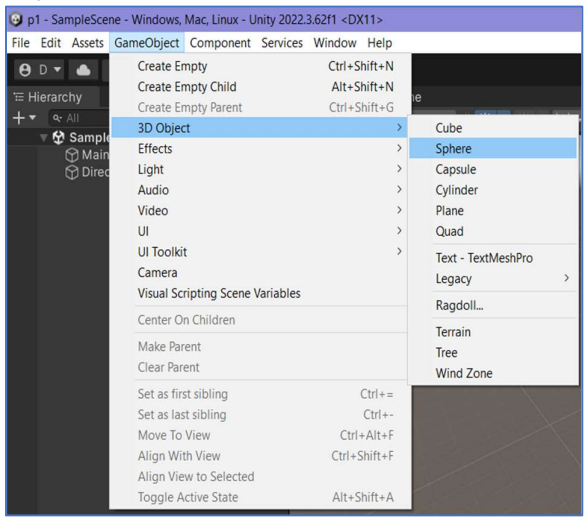
Step 1 to 3



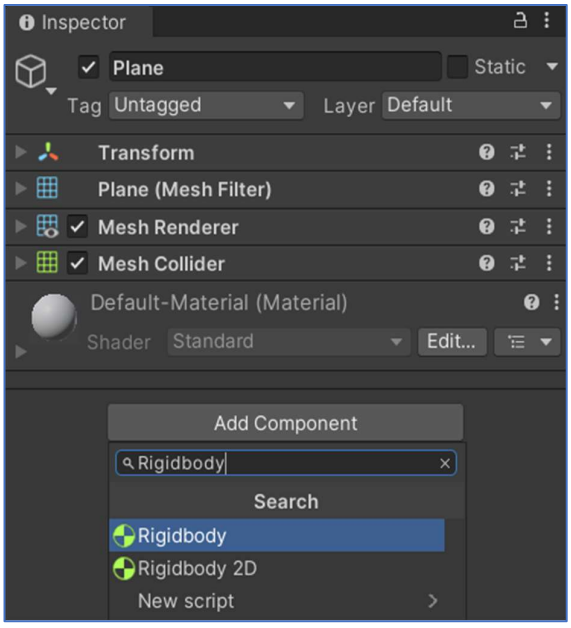
Step 4



Step 5



Step 6



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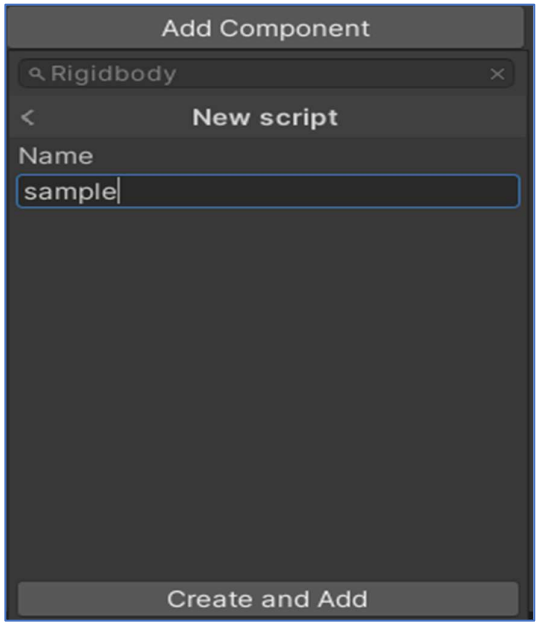

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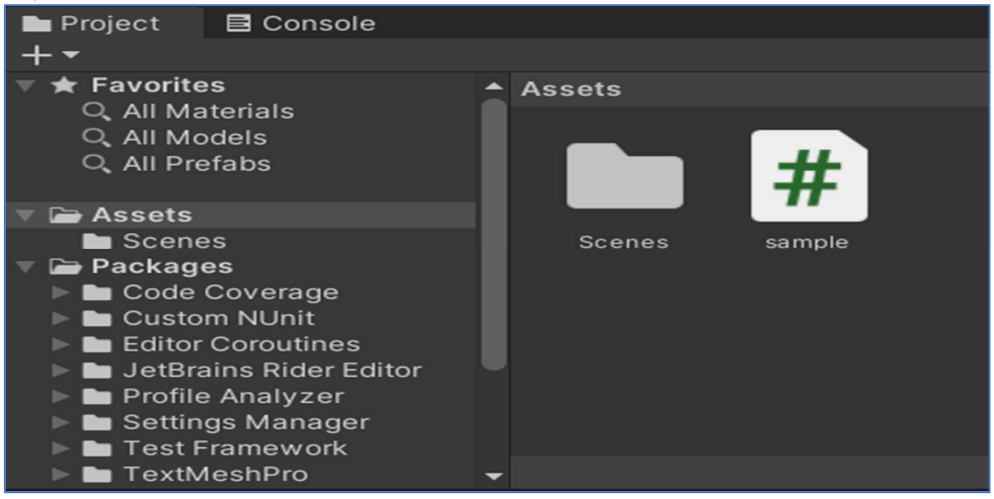
Step 8



Step 9:

C# Code

```
using System.Collections;
using System.Collections.Generic;
using UnityEngine;
public class ColorRandomizer : MonoBehaviour
{
   public float speed = 5f;
   // Start is called before the first frame update
   void Start()
   {
   }
   // Update is called once per frame
   void Update()
   {
      float h = Input.GetAxis("Horizontal");
      float v = Input.GetAxis("Vertical");
      transform.Translate(h * speed * Time.deltaTime, v * speed * Time.deltaTime, 0);
      if (Input.GetKey(KeyCode.Space))
      {
         GetComponent<Renderer>().material.color = Random.ColorHSV(0f, 1f, 1f, 1f, 0.5f, 1f);
      }
   }
}
```

Step 10: Run the file in Unity3D and see the output.

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Practical 6

Aim: Write a C# script for implementing virtual environment for enabling lights.

Steps:

Step No.	Step
1.	Open Unity3D
2.	Click on New Project --> Select 'All Templates' --> Select 3D Core --> Give a Project Name --> Click on Create Project
3.	Double Click on the Project Created
4.	Select Game Object --> 3D Object --> Plane
5.	Select Game Object --> 3D Object --> Sphere
6.	Now Click on 'Add Component' --> Select 'Rigid Body'
7.	Now Click on 'Add Component' --> Type a new name --> Select Script --> Select Create and Add
8.	Double Click on the Script File Created

9.	Type the code in the file that opens:
	
	`using System.Collections;`
	`using System.Collections.Generic;`
	`using UnityEngine;`
	
	`public class light : MonoBehaviour`
	`{`
	`  public Light myLight;`
	
	`  void Start()`
	`  {`
	`  myLight.GetComponent<Light>();`
	`  }`
	
	`  // Update is called once per frame`
	`  void Update()`
	`  {`
	`  if (Input.GetKey(KeyCode.L))`
	`  {`
	`  myLight.enabled = !myLight.enabled;`
	`  }`
	`  }`
	
	`}`

10.	Save and Go Back TO Unity3D
11.	Click on the 'Green Play Button' or 'Run'

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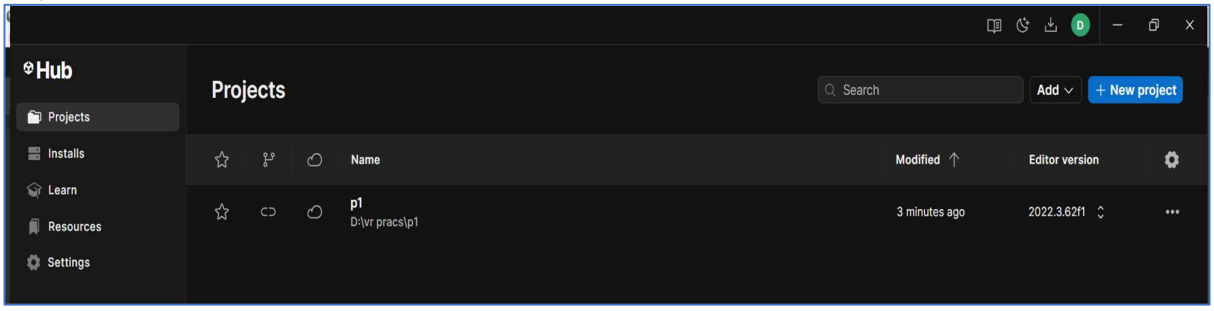
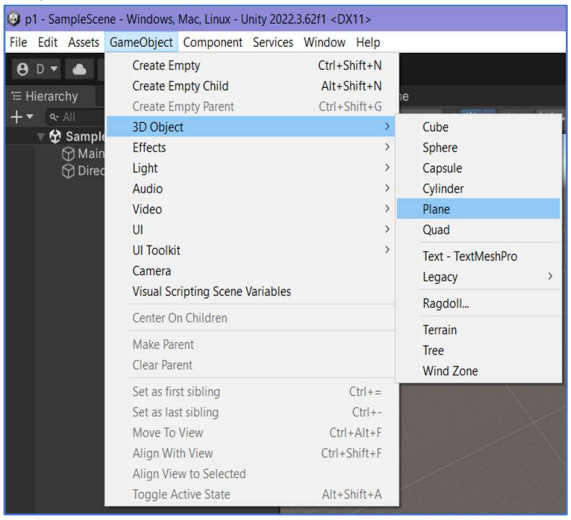
Screenshots:

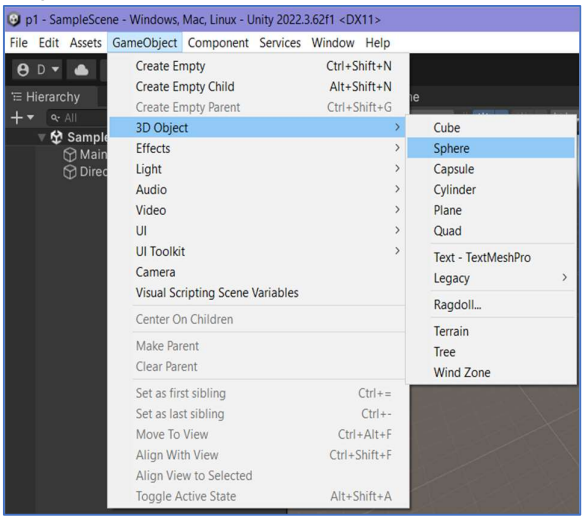
Step 1 to 3



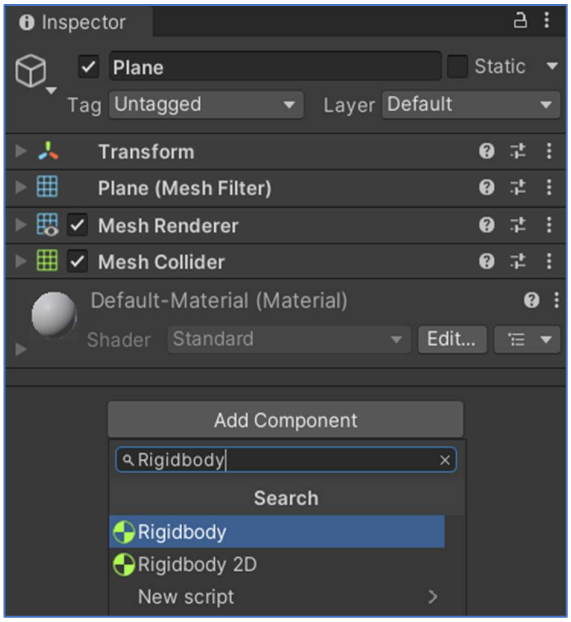
Step 4



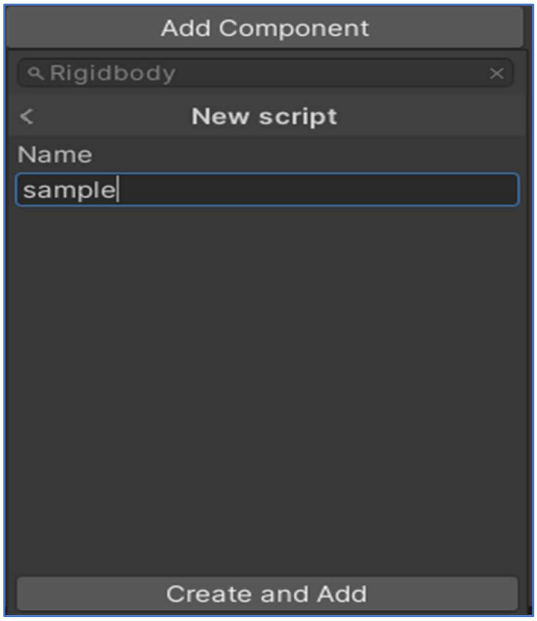
Step 5



Step 6



Step 7



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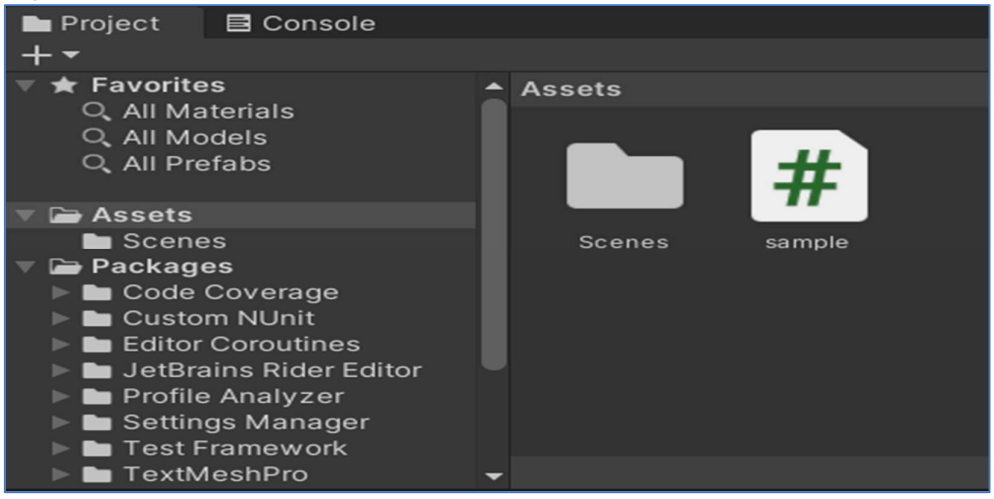
Step 8



Step 9

C# Code

```
using System.Collections;
using System.Collections.Generic;
using UnityEngine;
public class light : MonoBehaviour
{
    public Light myLight;

    void Start()
    {
        myLight.GetComponent<Light>();
    }
    // Update is called once per frame
    void Update()
    {
        if (Input.GetKey(KeyCode.L))
        {
            myLight.enabled = !myLight.enabled;
        }
    }
}
```

Step 10: Run the file in Unity3D and see the output.

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Practical 7

Aim: Write a C# script for implementing virtual environment for moving with camera.

Steps:

Step No.	Step
1.	Open Unity3D
2.	Click on New Project --> Select 'All Templates' --> Select 3D Core --> Give a Project Name --> Click on Create Project
3.	Double Click on the Project Created
4.	Select Game Object --> 3D Object --> Plane
5.	Select Game Object --> 3D Object --> Sphere
6.	Now Click on 'Add Component' --> Select 'Rigid Body'
7.	Now Click on 'Add Component' --> Type a new name --> Select Script --> Select Create and Add [Repeat the process twice – since we need to create 2 scripts]
8.	Double Click on the Script File Created
9.	Type the code in the file that opens:

Movement.cs

```
using System.Collections;
using System.Collections.Generic;
using UnityEngine;
public class movement : MonoBehaviour
{
    public float speed = 0.1f;
    // Start is called before the first frame update
    void Start()
    {

    }
    // Update is called once per frame
    void Update()
    {
        if (Input.GetKey(KeyCode.D))
        {
            transform.Translate(50f * speed * Time.deltaTime, 0, 0);
        }
        if (Input.GetKey(KeyCode.W))
        {
            transform.Translate(0, 0, 50f * speed * Time.deltaTime);
        }
        if (Input.GetKey(KeyCode.A))
        {
            transform.Translate(-50f * speed * Time.deltaTime, 0, 0);
        }
        if (Input.GetKey(KeyCode.S))
        {
            transform.Translate(0, 0, -50f * speed * Time.deltaTime);
        }

    }
}
```

	Camerafollow.cs
	#Create the camerafollow.cs script in 'Main Camera'.
	`using System.Collections;`
	`using System.Collections.Generic;`
	`using UnityEngine;`
	`public class camerafollow : MonoBehaviour`
	`{`
	`  public GameObject player;`
	`  public Vector3 offset;`
	`  void Start()`
	`  {`
	`  offset = transform.position - player.transform.position;`
	`  }`
	`  // Update is called once per frame`
	`  void Update()`
	`  {`
	`  }`
	`  void LateUpdate()`
	`  {`
	`  transform.position = player.transform.position + offset;`
	`  }`
	`}`

10.	Save and Go Back TO Unity3D
11.	Click on the 'Green Play Button' or 'Run'

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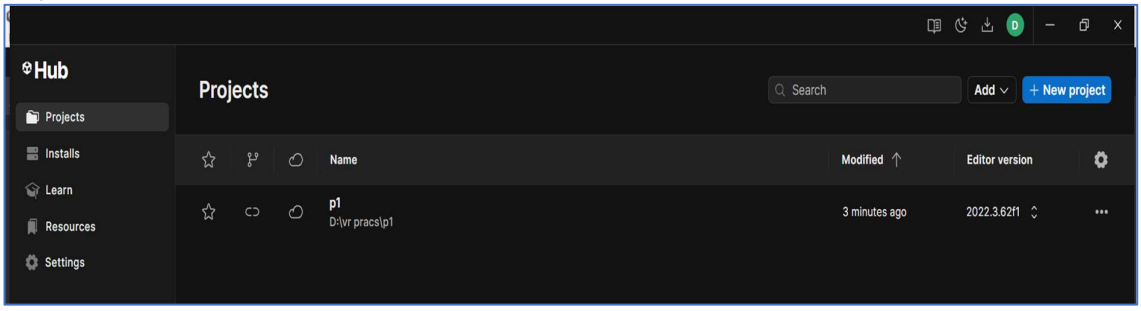
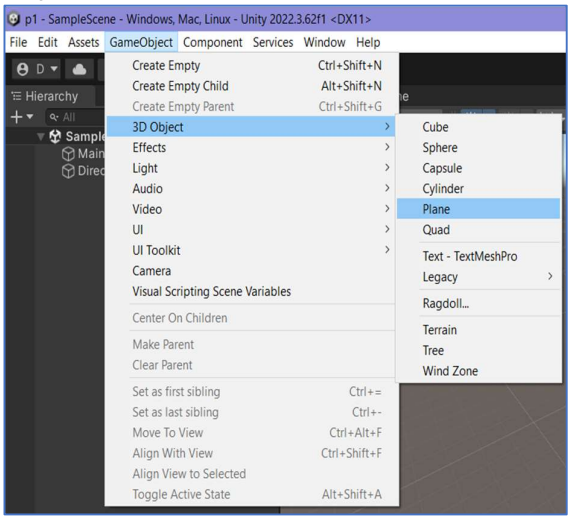
Screenshots:

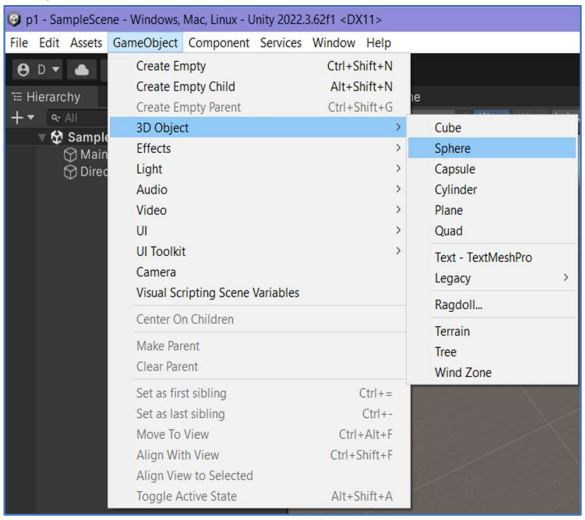
Step 1 to 3



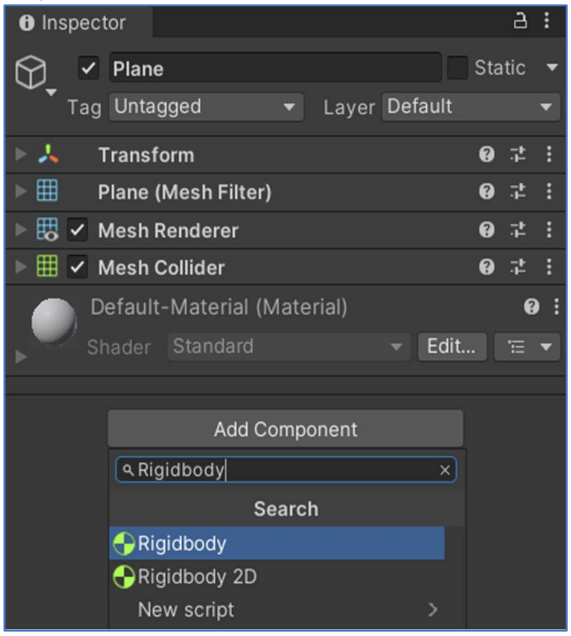
Step 4



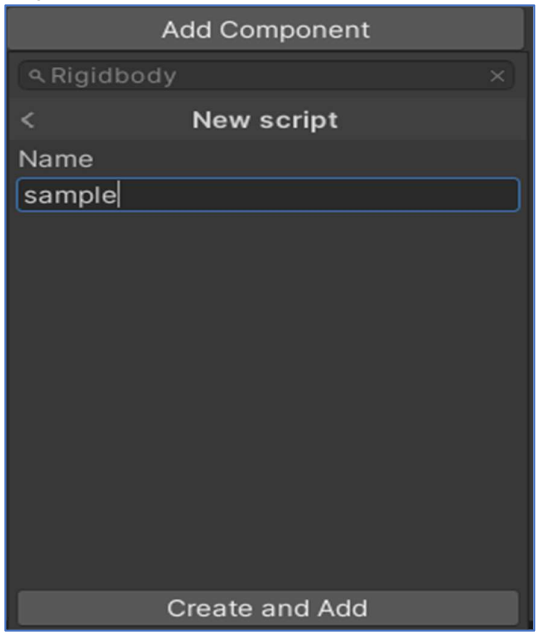
Step 5



Step 6



Step 7



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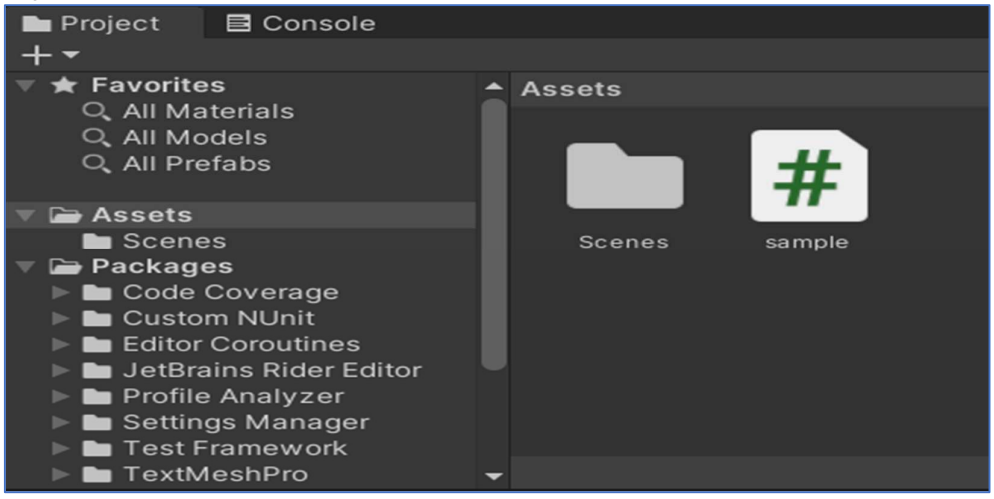
Step 8



Step 9

C# Code

Movement.cs

```
using System.Collections;
using System.Collections.Generic;
using UnityEngine;
public class movement : MonoBehaviour
{
   public float speed = 0.1f;
   // Start is called before the first frame update
   void Start()
   {

   }
   // Update is called once per frame
   void Update()
   {
      if (Input.GetKey(KeyCode.D))
      {
         transform.Translate(50f * speed * Time.deltaTime, 0, 0);
      }
      if (Input.GetKey(KeyCode.W))
      {
         transform.Translate(0, 0, 50f * speed * Time.deltaTime);
      }
      if (Input.GetKey(KeyCode.A))
      {
         transform.Translate(-50f * speed * Time.deltaTime, 0, 0);
      }
      if (Input.GetKey(KeyCode.S))
      {
         transform.Translate(0, 0, -50f * speed * Time.deltaTime);
      }

   }
}
```

Camerafollow.cs

```
#Create the camerafollow.cs script in 'Main Camera'.
using System.Collections;
using System.Collections.Generic;
using UnityEngine;
public class camerafollow : MonoBehaviour
{
  public GameObject player;
   public Vector3 offset;
   void Start()
   {
      offset = transform.position - player.transform.position;
   }
   // Update is called once per frame
   void Update()
   {

   }
   void LateUpdate()
   {
      transform.position = player.transform.position + offset;
   }

}
```

Step 10: Run the file in Unity3D and see the output.

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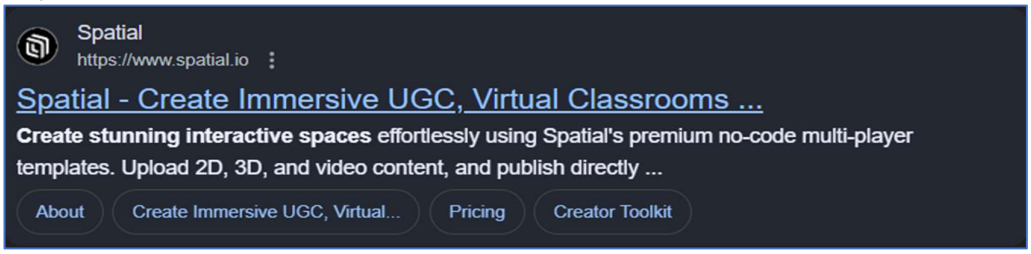
Practical 8

Aim: Demonstrate a sample project on “Spatial”.

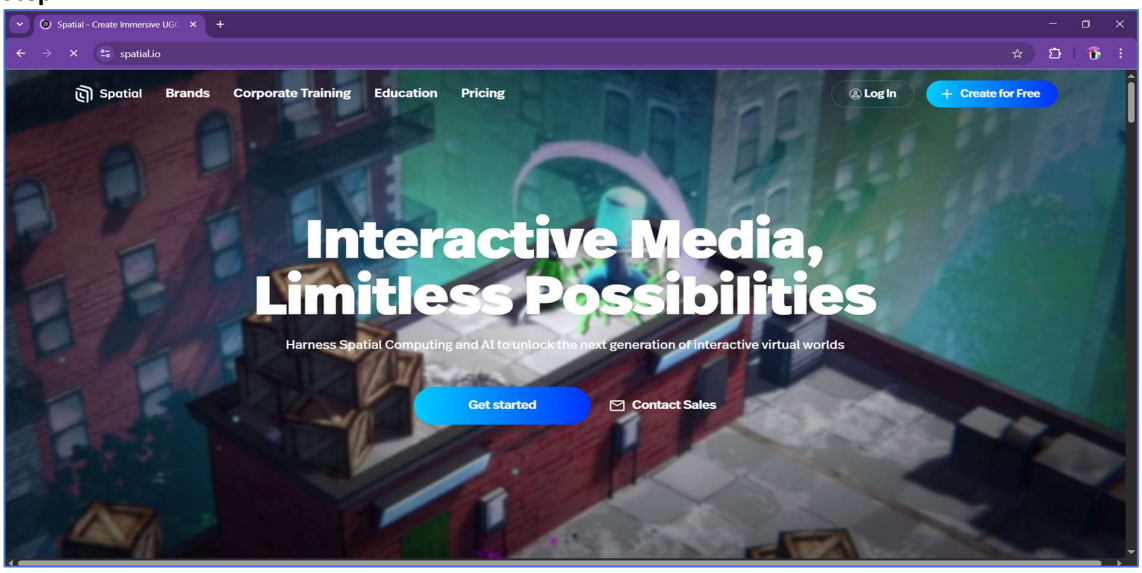
Steps:

Step No.	Description
1	Go to this link below https://www.spatial.io
2	Sign-in with your google account or any other option available there and create a username.
3	Click on New Space.
4	Click on Create a blank space or any other free option available there.
5	You will get a character and space which you can move and add some contents.
6	Add whatever content you want to add.
7	Adjust position, rotation, scale accordingly and show the final output.

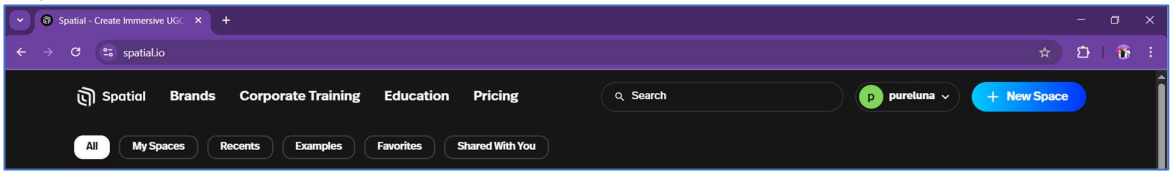
Step 1:



Step 2:



Step 3:



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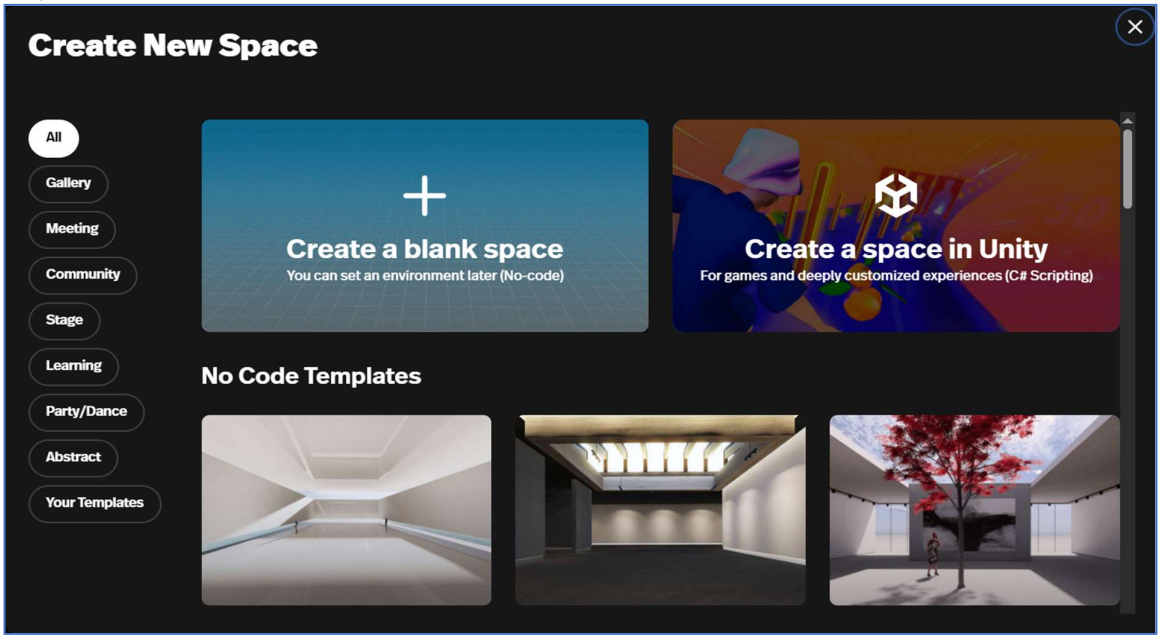
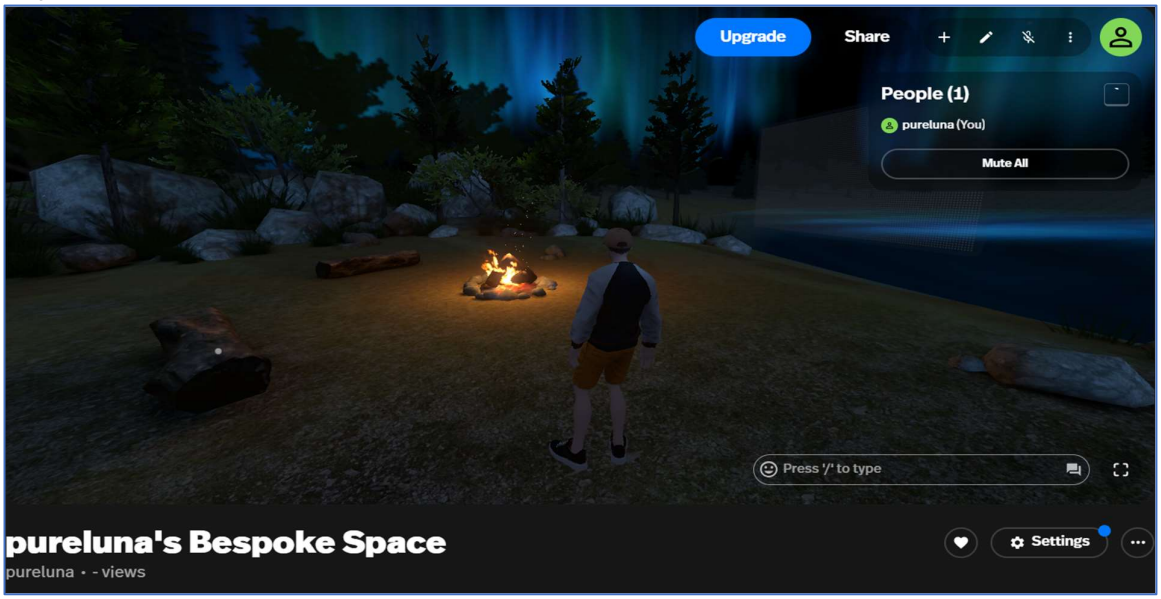
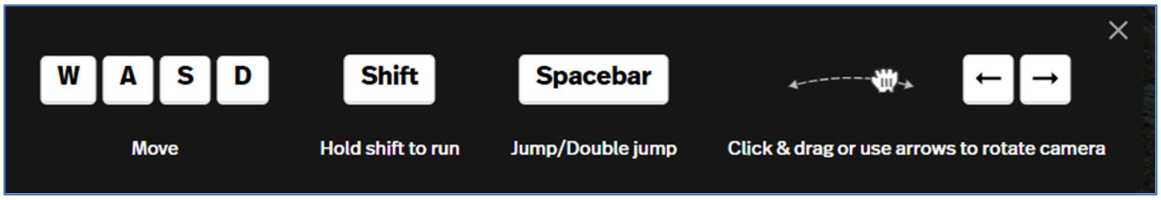
Step 4:



Step 5:





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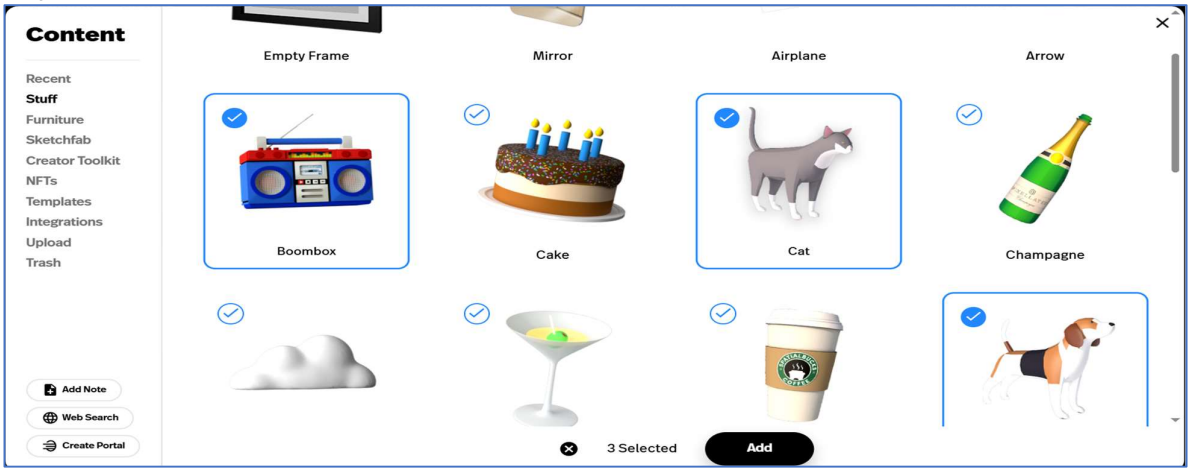
Step 6:



Step 7: