Practical No. 1: Implementing virtual environment for making an object jump

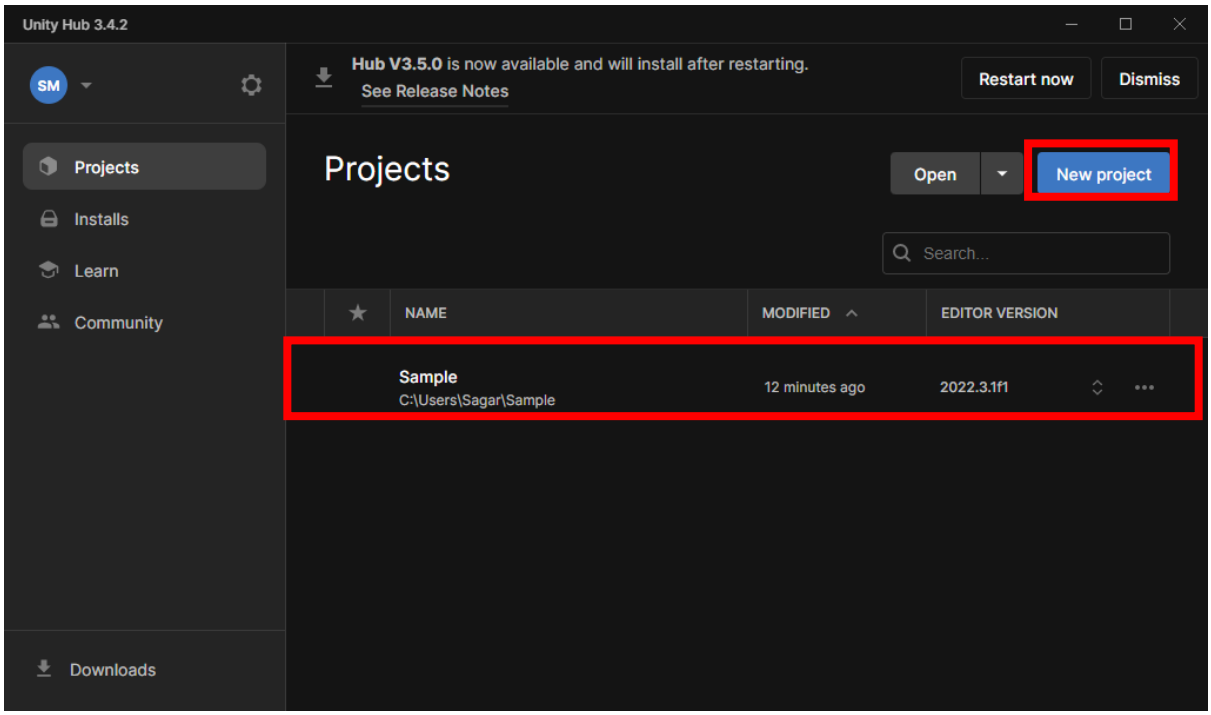
Step No.	Step
1.	Open Unity3D
2.	Click on New Project --> Select 'All Templates' --> Select 3D Core --> Give a Project Name --> Click on Create Project
3.	Double Click on the Project Created
4.	Select Game Object --> 3D Object --> Plane
5.	Select Game Object --> 3D Object --> Sphere
6.	Now Click on 'Add 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);`
	`        }`
	`    }`
	`}`

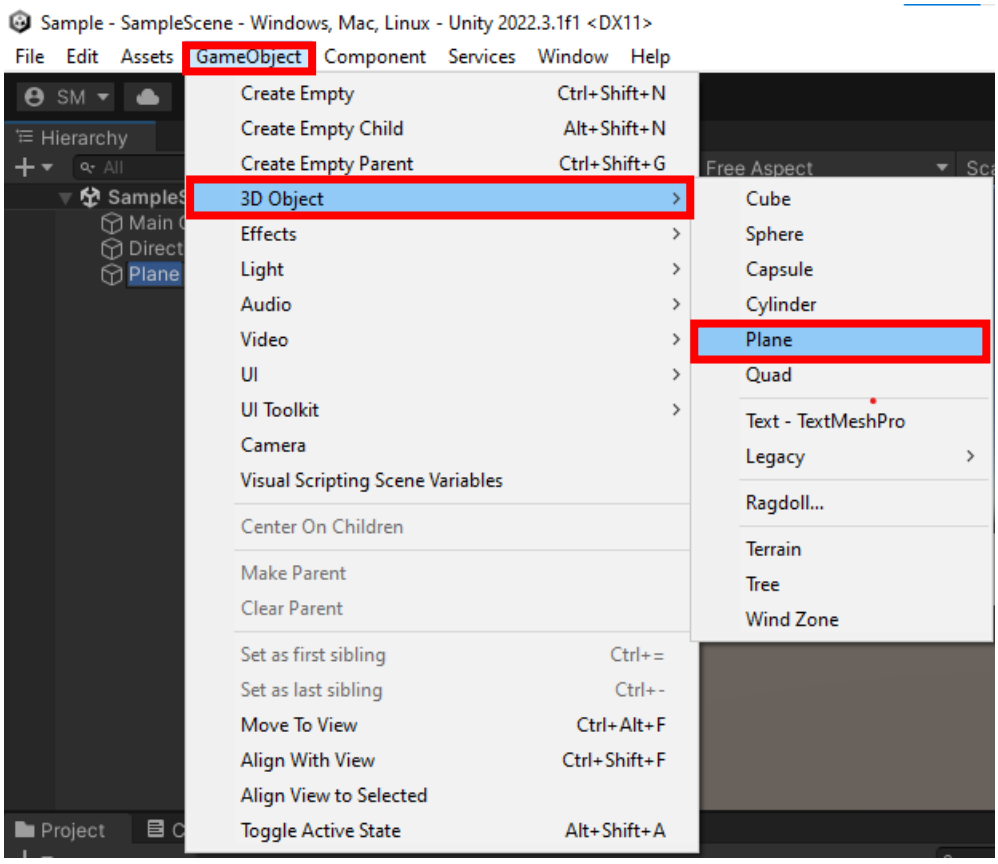
10.	Save and Go Back TO Unity3D
11.	Click on the 'Green Play Button' or 'Run'

Screenshots:

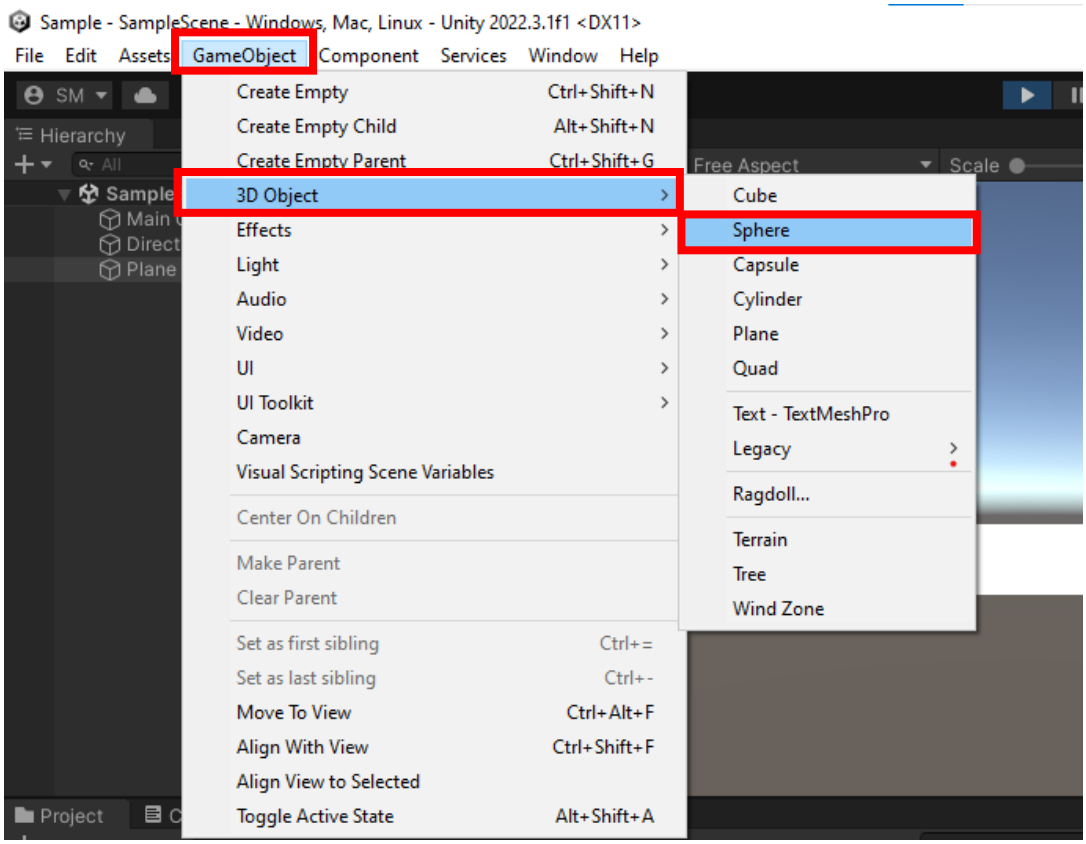
Step 1 to 3



Step 4:



Step 5: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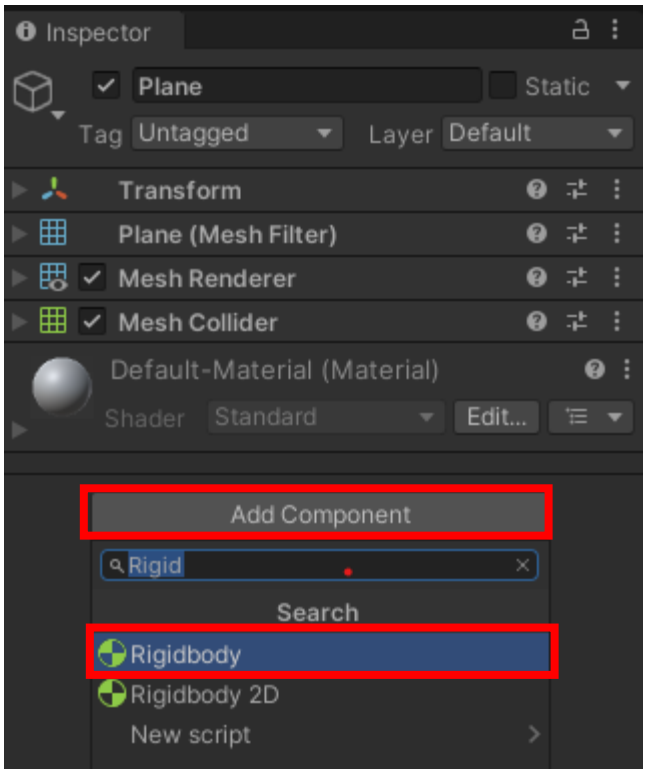
Create Empty Child Alt+Shift+N
Create Empty Parent Ctrl+Shift+G
3D Object
Effects
Light
Audio
Video
UI
UI Toolkit
Camera
Visual Scripting Scene Variables
Center On Children
Make Parent
Clear Parent
Set as first sibling Ctrl+=
Set as last sibling Ctrl+-
Move To View Ctrl+Alt+F
Align With View Ctrl+Shift+F
Align View to Selected
Toggle Active State Alt+Shift+A
Cube
Sphere
Capsule
Cylinder
Plane
Quad
Text - TextMeshPro
Legacy
Ragdoll...
Terrain
Tree
Wind Zone
Hierarchy
Project
Free Aspect
Scale

Step 6: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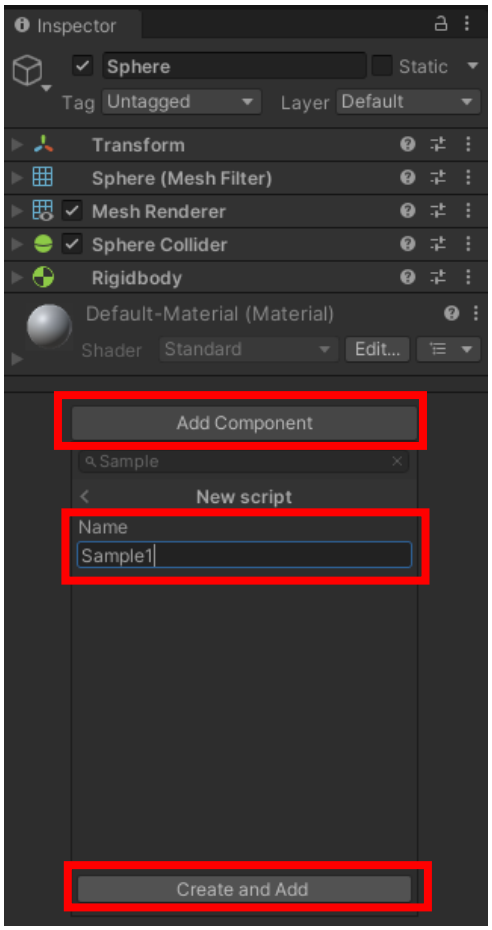
Plane
Static
Tag Untagged
Layer Default
Transform
Plane (Mesh Filter)
Mesh Renderer
Mesh Collider
Default-Material (Material)
Shader Standard
Edit...
Add Component
Rigid
Search
Rigidbody
Rigidbody 2D
New script

Step 7:


Inspector
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Tag Untagged
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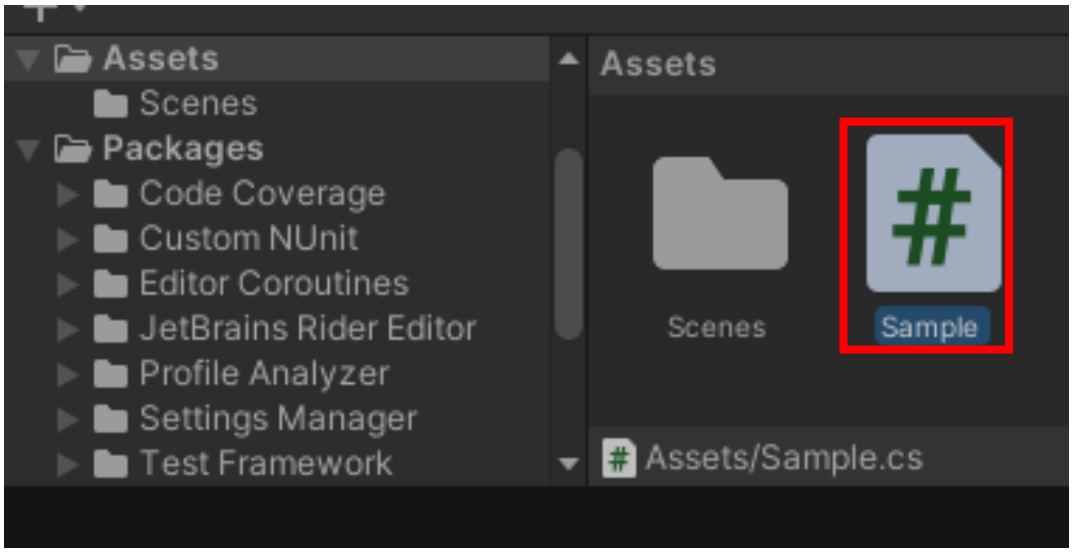
Sphere (Mesh Filter)
Mesh Renderer
Sphere Collider
Rigidbody
Default-Material (Material)
Shader Standard
Edit...
Add Component
Sample
New script
Name
Sample1
Create and Add

Step 8:


Assets
Scenes
Packages
Code Coverage
Custom NUnit
Editor Coroutines
JetBrains Rider Editor
Profile Analyzer
Settings Manager
Test Framework
Assets
Scenes
Sample
Assets/Sample.cs

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.

Practical No. 2: Implementing virtual environment for moving and making the object jump

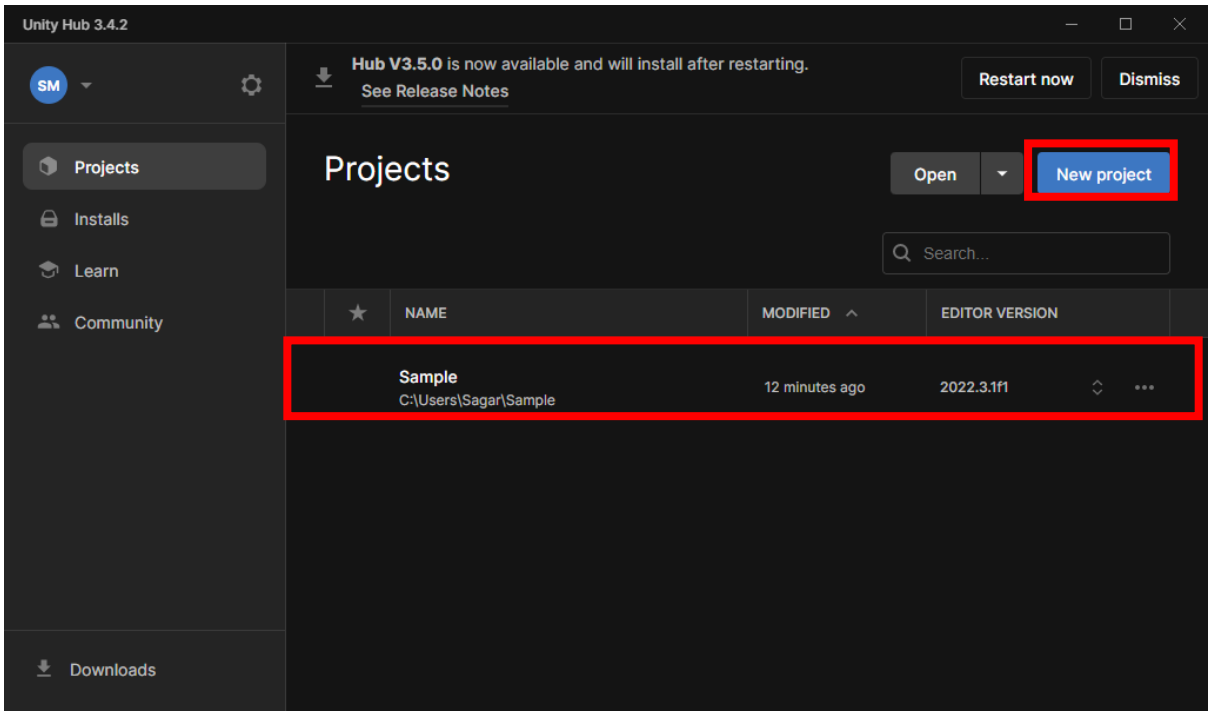
Step No.	Step
1.	Open Unity3D
2.	Click on New Project --> Select 'All Templates' --> Select 3D Core --> Give a Project Name --> Click on Create Project
3.	Double Click on the Project Created
4.	Select Game Object --> 3D Object --> Plane
5.	Select Game Object --> 3D Object --> Sphere
6.	Now Click on 'Add 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);`
	`  }`
	`  }`
	`}`

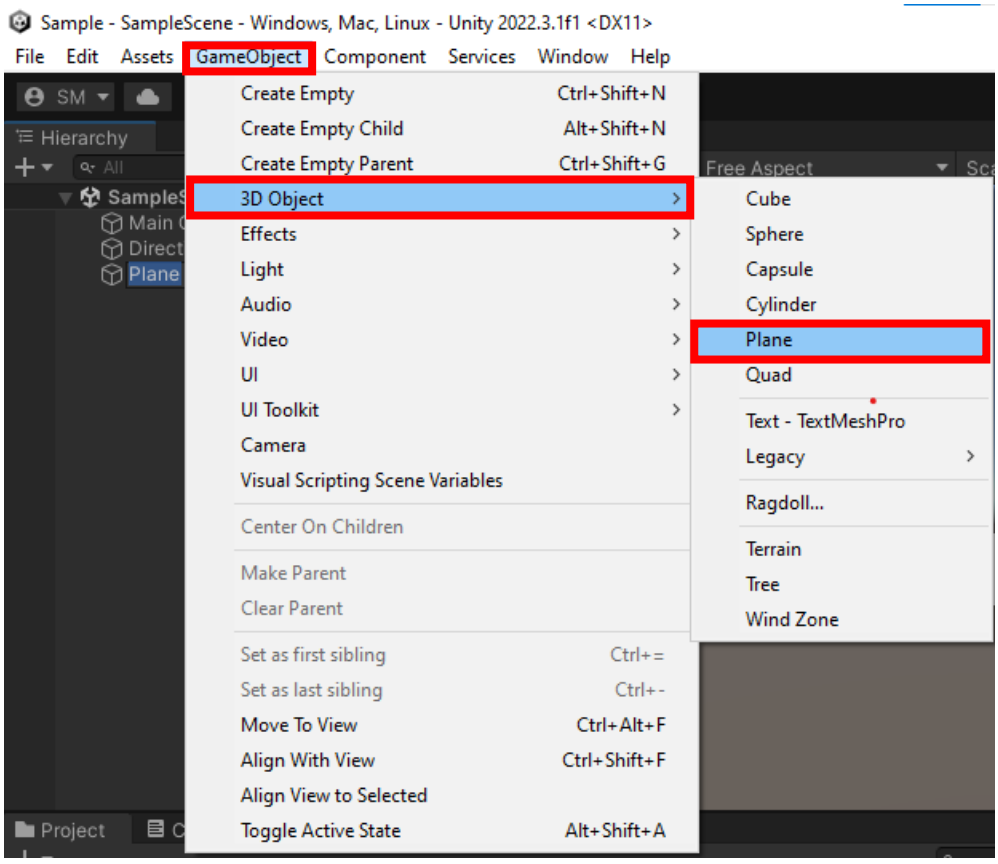
10.	Save and Go Back TO Unity3D
11.	Click on the 'Green Play Button' or 'Run'

Screenshots:

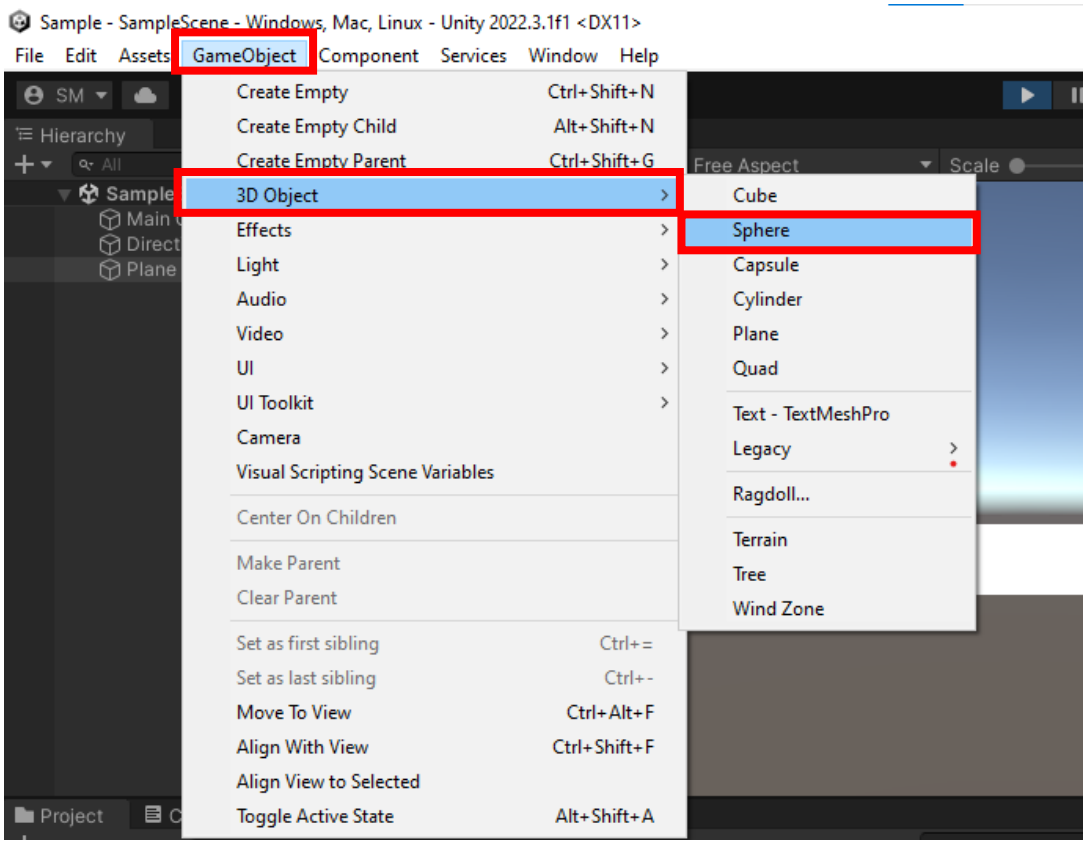
Step 1 to 3



Step 4:



Step 5:


Sample - SampleScene - Windows, Mac, Linux - Unity 2022.3.1f1 <DX11>
File Edit Assets GameObject Component Services Window Help
Create Empty Ctrl+Shift+N
Create Empty Child Alt+Shift+N
Create Empty Parent Ctrl+Shift+G
3D Object
Effects
Light
Audio
Video
UI
UI Toolkit
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Visual Scripting Scene Variables
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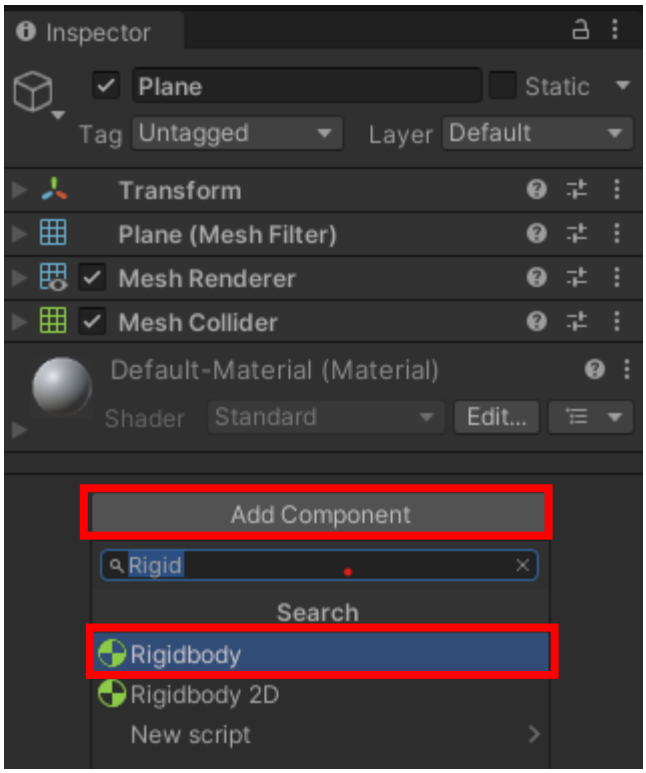
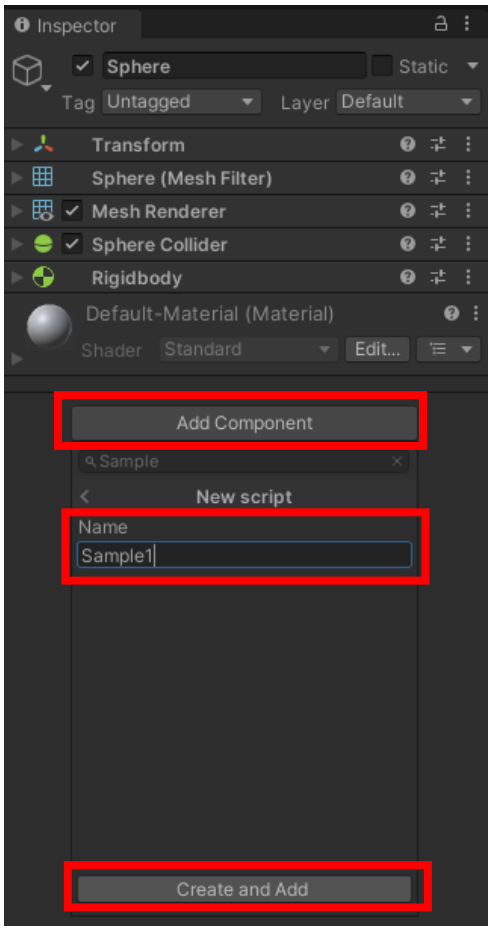
Sphere
Capsule
Cylinder
Plane
Quad
Text - TextMeshPro
Legacy
Ragdoll...
Terrain
Tree
Wind Zone
Hierarchy
Project
Free Aspect
Scale

Step 6:


Inspector
Plane
Static
Tag Untagged
Layer Default
Transform
Plane (Mesh Filter)
Mesh Renderer
Mesh Collider
Default-Material (Material)
Shader Standard
Edit...
Add Component
Rigid
Search
Rigidbody
Rigidbody 2D
New script

Step 7: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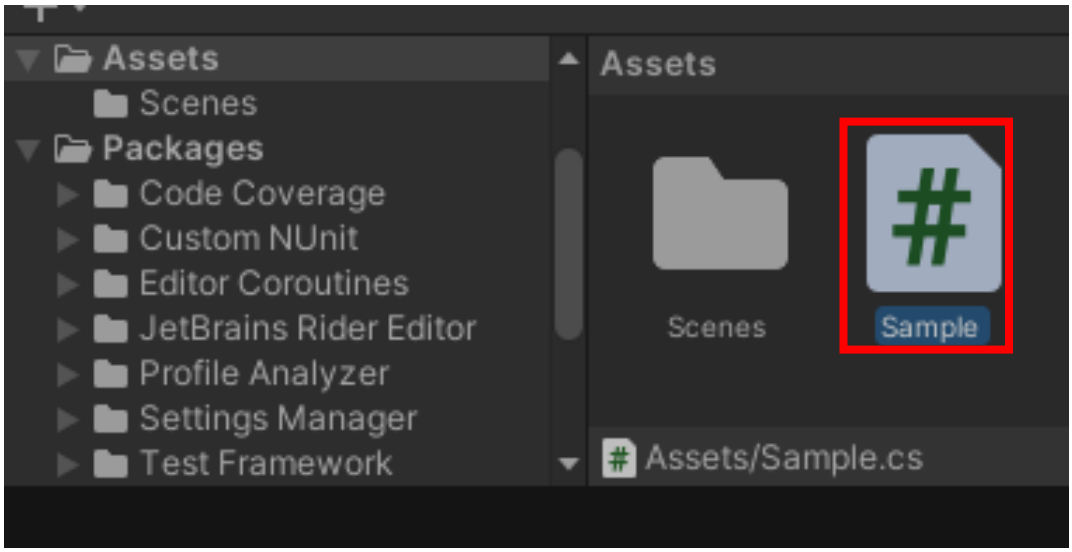
Mesh Renderer
Sphere Collider
Rigidbody
Default-Material (Material)
Shader Standard
Edit...
Add Component
Sample
New script
Name
Sample1
Create and Add

Step 8:


Assets
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JetBrains Rider Editor
Profile Analyzer
Settings Manager
Test Framework
Assets
Scenes
Sample
Assets/Sample.cs

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.

Practical No. 3: Implementing virtual environment for moving the object in all directions

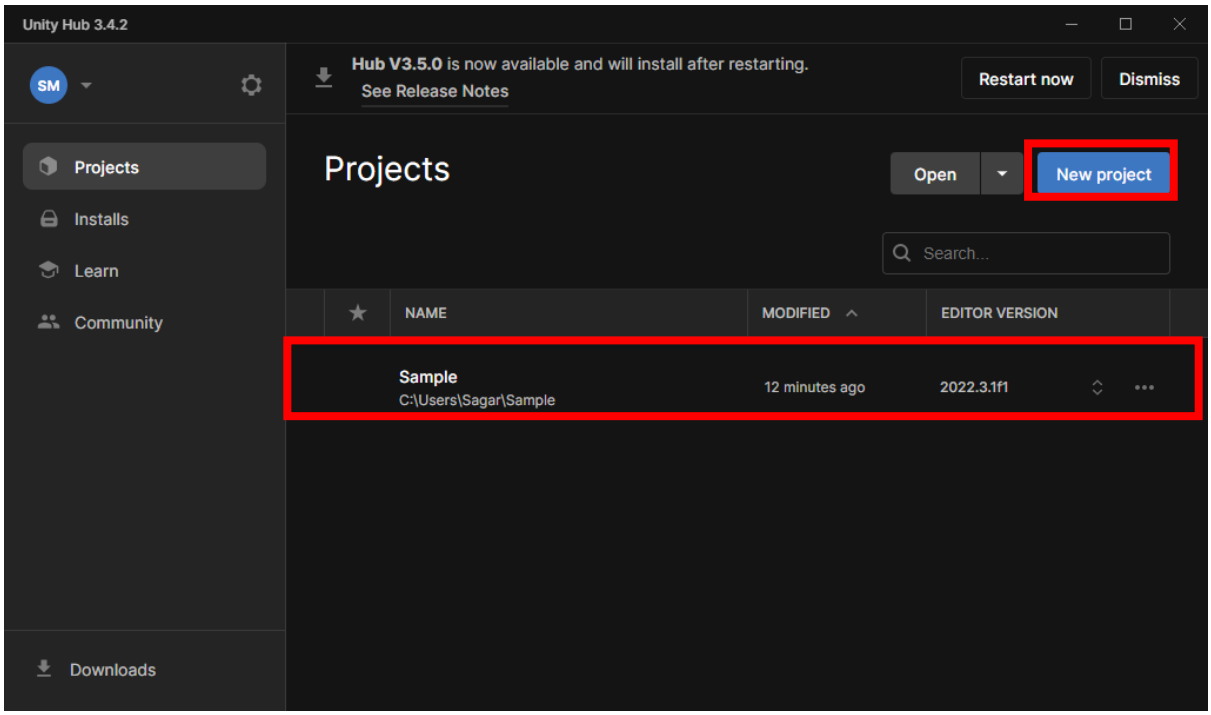
Step No.	Step
1.	Open Unity3D
2.	Click on New Project --> Select 'All Templates' --> Select 3D Core --> Give a Project Name --> Click on Create Project
3.	Double Click on the Project Created
4.	Select Game Object --> 3D Object --> Plane
5.	Select Game Object --> 3D Object --> Sphere
6.	Now Click on 'Add 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);`
	`  }`
	`  }`
	`}`

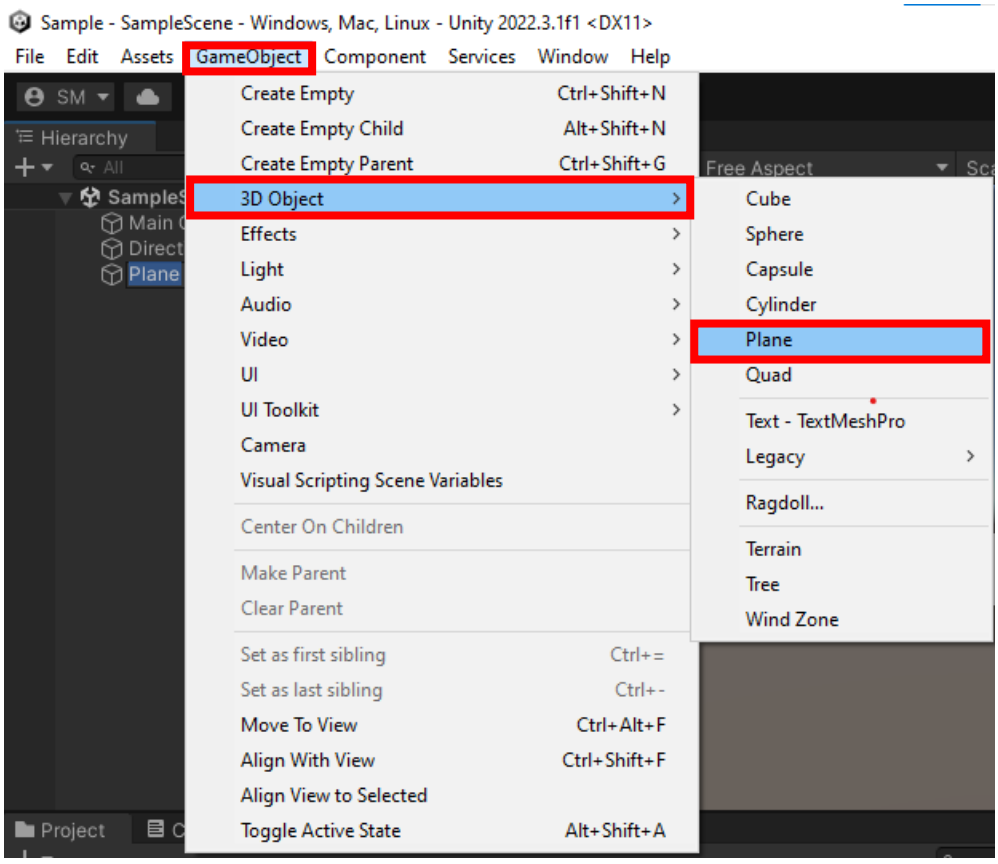
10.	Save and Go Back TO Unity3D
11.	Click on the 'Green Play Button' or 'Run'

Screenshots:

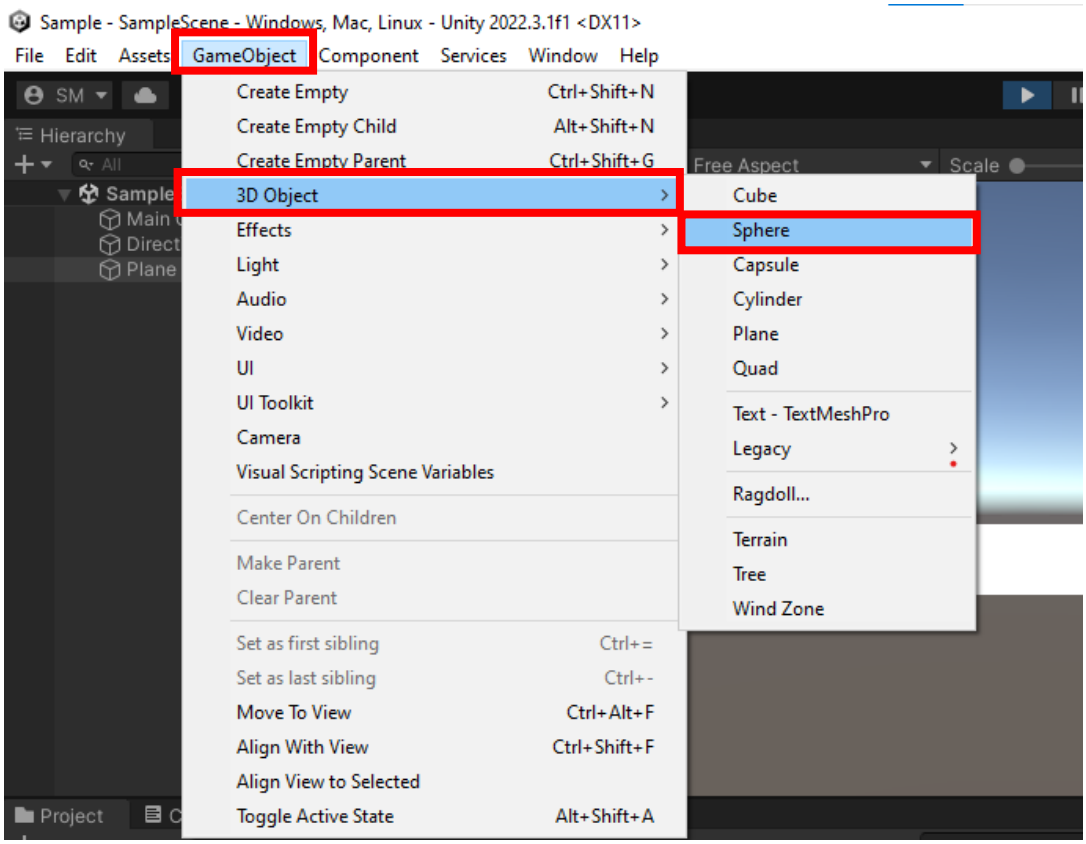
Step 1 to 3



Step 4:



Step 5:


Sample - SampleScene - Windows, Mac, Linux - Unity 2022.3.1f1 <DX11>
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Sphere
Capsule
Cylinder
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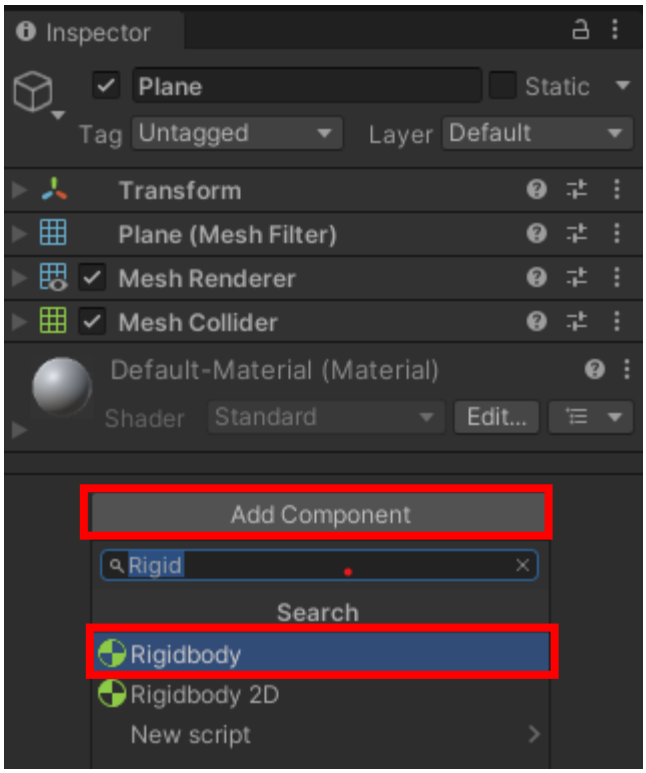
Text - TextMeshPro
Legacy
Ragdoll...
Terrain
Tree
Wind Zone
Hierarchy
Project
Free Aspect
Scale

Step 6: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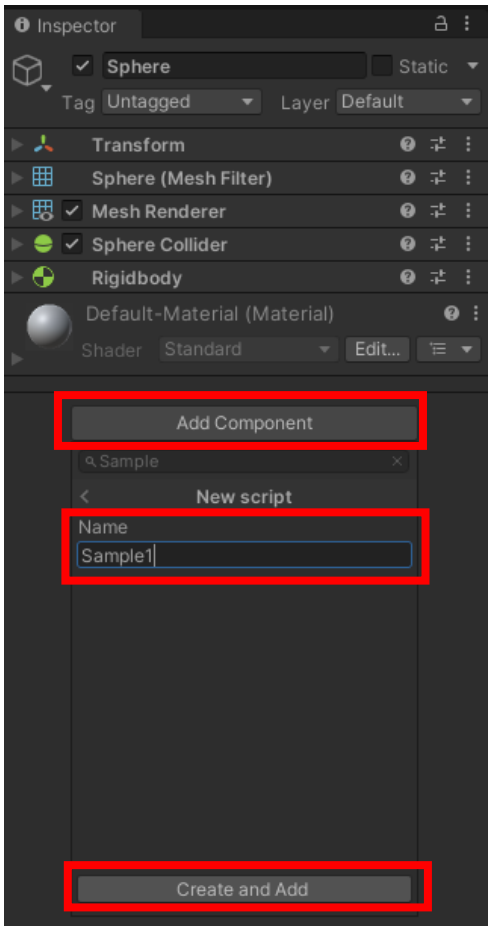
Mesh Renderer
Mesh Collider
Default-Material (Material)
Shader Standard
Edit...
Add Component
Rigid
Search
Rigidbody
Rigidbody 2D
New script

Step 7: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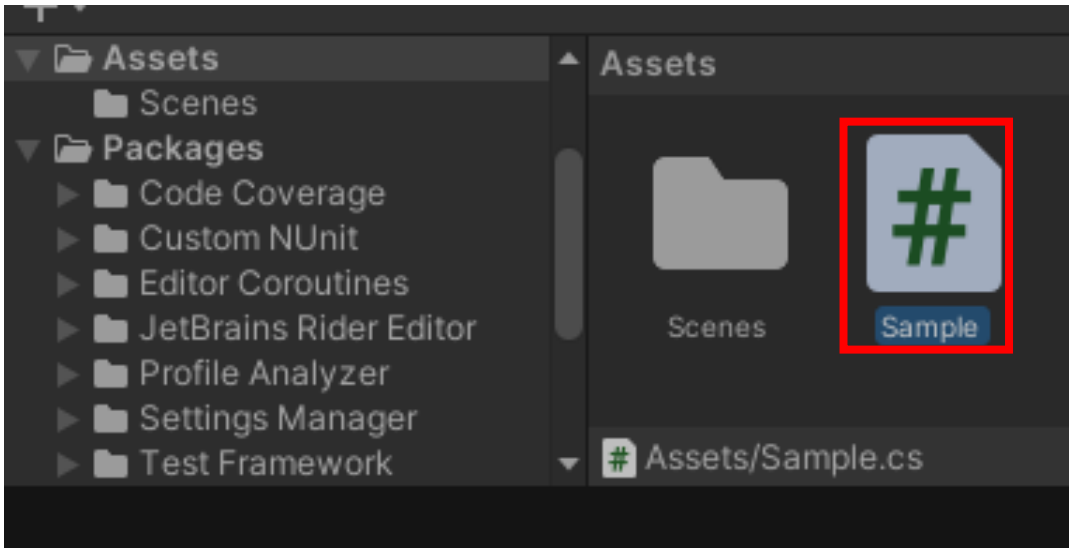
Mesh Renderer
Sphere Collider
Rigidbody
Default-Material (Material)
Shader Standard
Edit...
Add Component
Sample
New script
Name
Sample1
Create and Add

Step 8: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Profile Analyzer
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Test Framework
Assets
Scenes
Sample
Assets/Sample.cs

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.

Practical No. 4: Color Changer

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'

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

Practical No. 5: Color Randomizer

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'

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

Practical No. 6: Enabling Lights

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'

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

Practical No. 7: Moving with camera

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'

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