

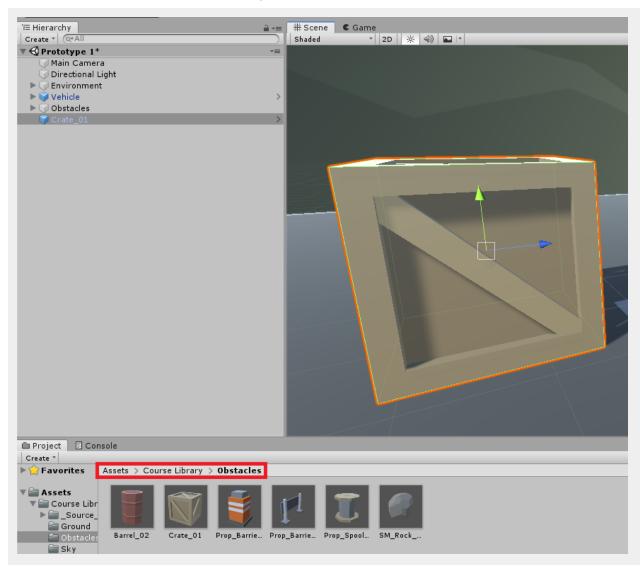
Bonus Features 1 Solution Walkthrough



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Easy - Obstacle Pyramids

1. Navigate to **Assets > Course Library > Obstacles**. Drag and drop any obstacle you like from the Project Window into the Scene View/Hierarchy



2. With the object select, navigate to the Inspector Window and click the **Add Component** button. Search for a **Rigidbody** and add that to your obstacle Game Object (Make sure it's not the Rigidbody2D component!)

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3. Edit the **Mass** value in the **Rigidbody** component to be more realistic! You can enter Play Mode to test your changes and see how heavy your obstacle is by driving into it. Just remember to exit Play Mode before making changes or they will not be saved!

Inspector		∂ •≡	
🍟 🗹 Crate_01		🗌 Static 🔻	
Tag Untagged	+ Layer Default	\$	
Prefab Open	Select Overrides	•	
▶🙏 Transform		💽 🕸 🔅	
🕨 🧾 SM_Prop_Crate_01 (Mesh Filter) 🛛 🔯			
🕨 🛃 🗹 Mesh Renderer		💽 🕂 🌣	
🕨 🗮 🗹 Mesh Collider		🔯 다 🌣	
🔻 🛵 🛛 Rigidbody		💽 🕂 🐥	
Mass	10		
Drag	0		
Angular Drag	0.05		
Use Gravity			
Is Kinematic			
Interpolate	None	\$	
Collision Detection	Discrete	\$	
▶ Constraints			
MilitaryProps		🔯 🕂 🐥	
▶ 🤎 Shader Standar	d	•	
A	dd Component		

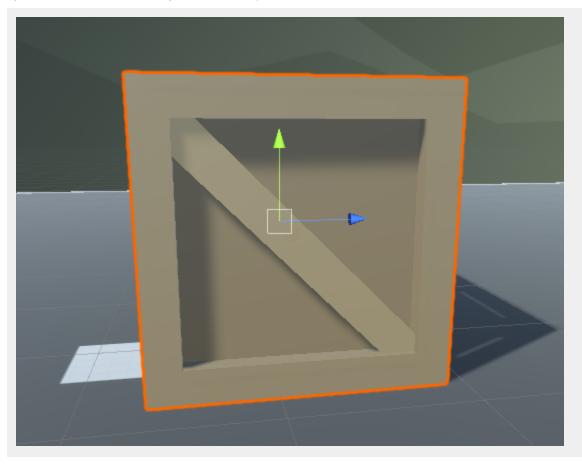
4. In the Project Window, navigate to **Assets**. Right click on an empty space within the Project Window and Choose **Create > Folder**. Name this folder *"Prefabs"*.

Project 🛛 E Cor	nsole
▶ 😭 Favorites	Assets >
Assets Assets Assets Course Libr Prefabs Scenes Scripts Packages	Course Libr. Prefabs Scenes Scripts

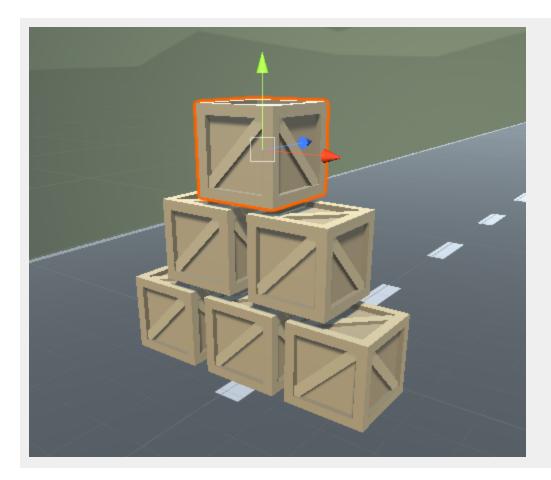
5. From the Hierarchy drag and drop your chosen obstacle to the newly created Prefabs folder. This will enable you to make changes to all existing instances of your prefab within the scene view much quicker. If a pop-up appears, click **Original Prefab**.

Project 🗄 Cor	nsole
► ☆ Favorites	Assets >
 Assets Course Libr Prefabs Scenes Scripts Packages 	Course Libr. Prefabs Scenes Scripts

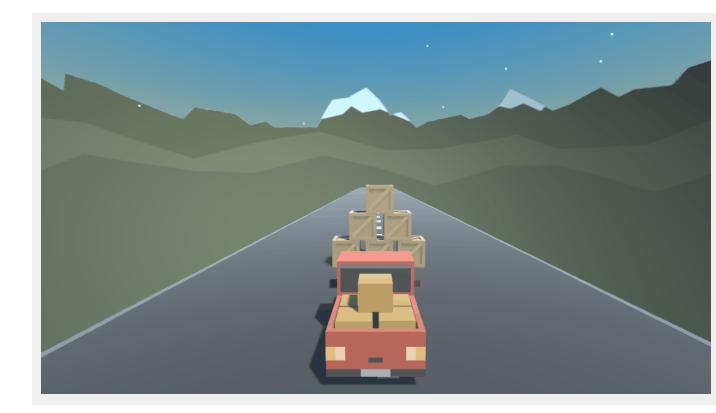
6. Select the newly placed object(s) and reposition them using the Transform Tool Tip: You can select multiple objects at once by holding down ctrl/cmd whilst selecting. This will allow you to move multiple objects at once!)



7. With your object selected in the Scene View, you can press ctrl/cmd + D to duplicate an individual object or a selection of objects. Create a pyramid out of the new objects.

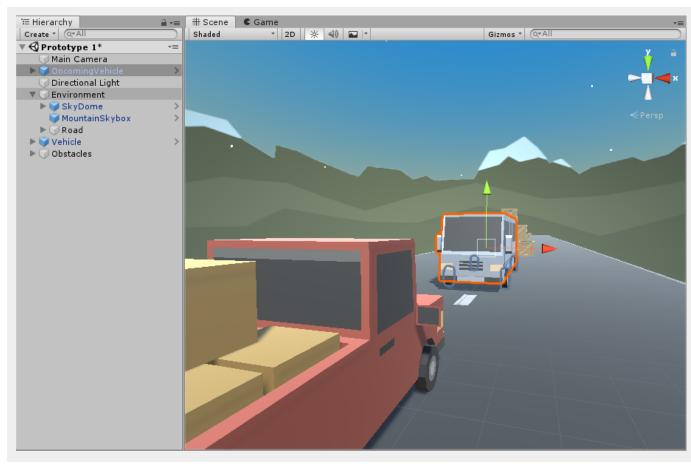


8. Save the scene. Press play and drive into the pyramid.



Medium - Oncoming Vehicles

 Navigate to Assets > Course Library > Vehicles. Drag and drop a vehicle you like into the Scene View. Make sure to rotate it around 180 degrees so it's facing towards the player vehicle. Change its name to OncomingVehicle



2. In the Inspector for the Oncoming Vehicle, click Add **Component** and search for **Rigidbody**. Adjust the **Mass** value to be appropriate for the new vehicle.

Inspector									1	•≡
🍟 🗹 OncomingVehicl	le			_]	Sta	tic	•
Tag Untagged		\$	Laye	r	Default					\$
Prefab Open		Sele	ct		Override	s				•
▼人 Transform									킕	۵.
Position	X	0	Y	1	0	z	15			
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Scale	X	1	Y	1	1	Z	1			
▶ 🗒 ST_Veh_Bus_Blue	_z	(Mesh	Filter	r)					킕	¢.
🕨 🛃 🗹 Mesh Renderer									킕	¢.
🕨 🔠 🗹 Mesh Collider									킕	\$
🔻 🙏 Rigidbody									킕	\$
Mass	25	500								
Drag	0									
Angular Drag	0.	.05								
Use Gravity	✓	1								
Is Kinematic]								
Interpolate		lone								ŧ
Collision Detection		iscrete								+
▶ Constraints										

3. Right click within the Scripts folder in the Project Window and choose **Creare > C# Script**. Name this script **MoveForward** and open it.

	Create >	Folder C# Script Shader > Testing >
	Show in Explorer Open Delete Rename Copy Path Alt+Ctrl+C	Playables > Assembly Definition > TextMeshPro > Scene Prefab Variant
■ Project E Console	Open Scene Additive Import New Asset Import Package > Export Package Find References In Scene Select Dependencies	Audio Mixer Material Lens Flare Render Texture Lightmap Parameters Custom Render Texture
Create * Favorites Assets	Refresh Ctrl+R Reimport Reimport All	Sprite Atlas Sprites > Tile
 Course Libr Prefabs Scenes Scripts FollowPlayer PlayerCont 	Extract From Prefab Run API Updater Update UIElements Schema	Animator Controller Animation Animator Override Controller Avatar Mask

4. Before the Start method, add a new variable:

public int speed;

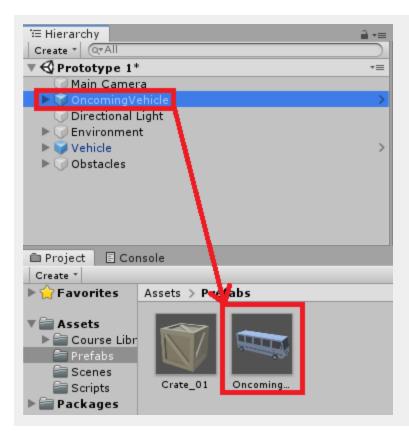
Next, within the Update method have the Vehicle automatically move forward multiplied by the speed and Time.deltaTime:

```
void Update()
{
    transform.Translate(Vector3.forward * speed * Time.deltaTime);
}
```

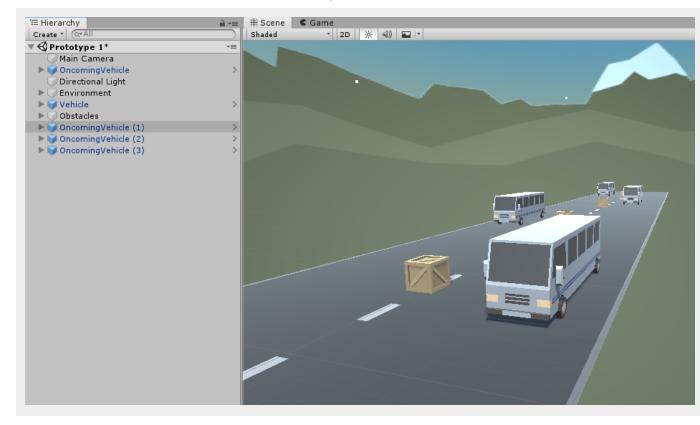
Save the script, go back to the Unity Editor, add the Move Forward script to the Oncoming Vehicle and assign an appropriate speed value in the Inspector:

	-								
Inspector								2	•≡
👕 🗹 OncomingVehic	le		_				Sta	tic	•
Tag Untagged		ŧ Lay	er	Default					\$
Prefab Open		Select		Override	s				•
▼人 Transform								킕	\$,
Position	X	0	Y	0	z	15			
Rotation	X	0	Y	-180	z	0			
Scale	х	1	Υ	1	Ζ	1			
▶ 📃 ST_Veh_Bus_Blue	_z	(Mesh Filte	er))				킕	\$,
🕨 🛃 🗹 Mesh Renderer								킕	\$,
🕨 🔠 🗹 Mesh Collider								킕	\$,
🔻 🙏 Rigidbody								킕	\$,
Mass	2	500							
Drag	0								
Angular Drag	0	.05							
Use Gravity	☑	1							
Is Kinematic)							
Interpolate		lone							ŧ
Collision Detection)iscrete							ŧ
▶ Constraints									
🔻 🔩 🗹 Move Forward (Sc	ri	pt)						킕	۵
Script		MoveForwar	d						0
Speed	1	5							

6. Drag the Oncoming Vehicle from the Hierarchy into the Prefabs folder. If a window appears, click **Original Prefab**.



7. Duplicate the OnComing Vehicle in the Hierarchy and place them throughout the road.





8. Save the scene and press play. The vehicles will draw towards you and try to push you out the way.

Hard - Camera Switcher

1. Navigate to the Scripts folder and open up the **Player Controller** script. Before the **Start** method add the following variables:

```
public Camera mainCamera;
public Camera hoodCamera;
public KeyCode switchKey;
```

2. Next, in the **Update** method, add the following after the **transform.Rotate** line.

```
if(Input.GetKeyDown(switchKey))
{
    mainCamera.enabled = !mainCamera.enabled;
    hoodCamera.enabled = !hoodCamera.enabled;
}
```

This code will toggle which camera is enabled when the F key is pressed. The updated Update method should look like this:

```
void Update()
{
    // Axis setup
    horizontalInput = Input.GetAxis("Horizontal");
    forwardInput = Input.GetAxis("Vertical");
    // Move the vehicle forward
    transform.Translate(Vector3.forward * Time.deltaTime * speed * forwardInput);
    // Rotate the vehicle left and right
    transform.Rotate(Vector3.up, turnSpeed * horizontalInput * Time.deltaTime);
    if(Input.GetKeyDown(switchKey))
    {
        mainCamera.enabled = !mainCamera.enabled;
        hoodCamera.enabled = !hoodCamera.enabled;
    }
}
```

Save the script and head back to Unity.

3. In the Hierarchy, right-click on the Vehicle GameObject and select Camera.

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Create *	QTAII		
🔻 🚭 Prot	otype 1*		*=
Ma Na Vi Di	ain Camera ncomingVehicle rectional Light ivironment		>
	Сору		>
	Paste		>
			>
▶ 6	Rename		>
	Duplicate		
	Delete		
	Open Prefab Asset		
	Select Prefab Asset		
	Unpack Prefab		
	Unpack Prefab Completely	.	
	Create Empty		
	3D Object	>	
	2D Object	>	
	Effects	>	
	Light	>	
	Audio	>	
	Video	>	
	UI	>	
	Camera		

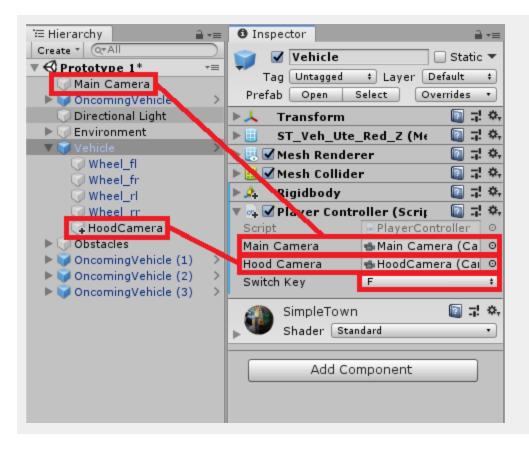
4. Rename the new Camera to be *HoodCamera*. Change the **y** position of the camera to **2.1**. Disable the Camera component by clicking the checkbox to the right of the component name.

Inspector		_ ⊒ -=
HoodCamera	🗌 St	atic 🔻
Tag Untagged	‡ Layer Default	\$
▼人 Transform		다 수,
Position	X 0 Y 2.1 Z 0	
Rotation	X 0 Y 0 Z 0	
Scale	X 1 Y 1 Z 1	
🔻 💼 🗌 Camera		다 수,
Clear Flags	Skybox	\$
Background		I I
Culling Mask	Everything	;
Projection	Perspective	+
Field of View	60	5
Physical Camera		
Clipping Planes	Near 0.3	
	Far 1000	_
Viewport Rect	X 0 Y 0	
	W 1 H 1	
Depth	0	
Rendering Path	Use Graphics Settings	+
Target Texture	None (Render Texture)	0
Occlusion Culling		
Allow HDR		
Allow MSAA		
Allow Dynamic Resoluti		
Target Display	Display 1	+

5. Remove the Audio Listener that is on the HoodCamera by clicking on the Gear and selecting **Remove Component**.

Inspector	ê * ≡
HoodCamera	🗌 Static 🔻
Tag Untagged	Layer Default +
▶ 🙏 Transform	💽 류 🏊
🕨 🚍 🗌 Camera	💽 🕸 🔅
😕 🗹 Audio Listener	🔟 🗐 🛱 💆
Add	Reset
	Remove Component
	Move Up
	Move Down
	Copy Component
	Paste Component As New
	Paste Component Values
	Find References In Scene
_	

6. In the Hierarchy, select the Vehicle GameObject. Drag the *Main Camera* from the Hierarchy into the **Main Camera** field on the **Player Controller** component. Then, drag the *HoodCamera* from the Hierarchy into the **Hood Camera** field on the **Player Controller** component. Ensure that the Switch Key parameter is set to **F**.



7. Save the scene and press play. Try press F to switch between the cameras.



Expert - Local Multiplayer

1. Navigate to the Scripts folder and open up the **Player Controller** script. Before the **Start** method, add a new variable. We will use this variable to determine which player is using the script.

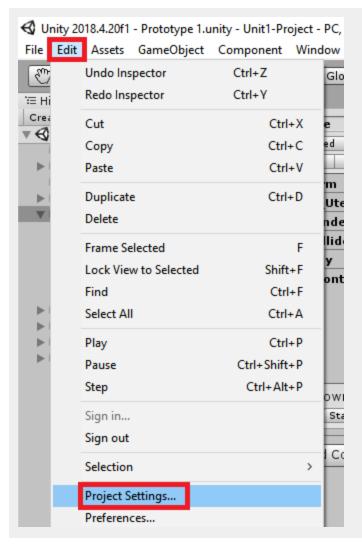
public string inputID;

2. Inside the **Update** method, update the way the horizontal and forward inputs are set.

```
horizontalInput = Input.GetAxis("Horizontal" + inputID);
forwardInput = Input.GetAxis("Vertical" + inputID);
```

Save the script and head back to Unity.

3. Now let's set up the Input Manager to have the two different inputs. Go to Edit > Project Settings



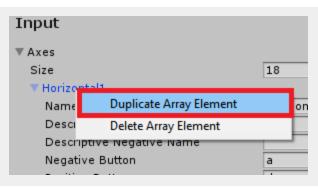
4. In the new window that opens, select **Input** from the left hand side. Then click the arrow to the right of the Axes heading.

Audio	Toout
Editor	Input
Graphics	Axes
Input	
Physics	
Physics 2D	
Player	
Preset Manager	
Quality	
Script Execution Orc	
Tags and Layers	
TextMesh Pro	
Time	
VFX	

5. Rename the first option in the Axes to *"Horizontal1"*. Change the **Negative Button** to **a** and the **Positive Button** to **d**. Ensure there is no Alt Negative or Alt Positive buttons set.

Input	🔯 🕂 🌣
▼ Axes	
Size	18
Torizontal1	
Name	Horizontal1
Descriptive Name	
Descriptive Negative Name	
Negative Button	a
Positive Button	d
Alt Negative Button	
Alt Positive Button	
Gravity	3
Dead	0.001
Sensitivity	3
Snap	
Invert	
Туре	Key or Mouse Button \$
Axis	X axis ‡
Joy Num	Get Motion from all Joysticks \$
▶ Vertical	
▶ Fire1	

6. Right-click on the **Horizontal1** heading and select **Duplicate Array Element**.



7. Rename the new array element to *Horizontal2*. Adjust the **Negative Button** to **left** and the **Positive Button** to **right**. The completed Horizontal elements should look like this:

▼ Axes	
Size	19
🔻 Horizontal1	
Name	Horizontal1
Descriptive Name	
Descriptive Negative Name	
Negative Button	a
Positive Button	d
Alt Negative Button	
Alt Positive Button	
Gravity	3
Dead	0.001
Sensitivity	3
Snap	
Invert	
Туре	Key or Mouse Button \$
Axis	X axis \$
Joy Num	Get Motion from all Joysticks \$
▼ Horizontal2	
Name	Horizontal2
Descriptive Name	
Descriptive Negative Name	
Negative Button	left
Positive Button	right
Alt Negative Button	
Alt Positive Button	
Gravity	3
Dead	0.001
Sensitivity	3
Snap	
Invert	
Туре	Key or Mouse Button +
Axis	X axis +
Joy Num	Get Motion from all Joysticks \$

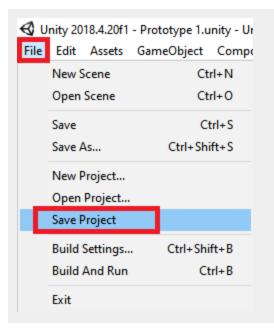
8. Collapse the two elements we just did and expand the Vertical array element and rename it to *Vertical1*. change the **Negative Button** to **s** and the **Positive Button** to **w**. Remove any parameters that are in the **Alt Negative Button** or **Alt Positive Button** fields.

▼ Vertical1	
Name	Vertical1
Descriptive Name	
Descriptive Negative Name	
Negative Button	S
Positive Button	W
Alt Negative Button	
Alt Positive Button	
Gravity	3
Dead	0.001
Sensitivity	3
Snap	
Invert	
Туре	Key or Mouse Button \$
Axis	X axis +
Joy Num	Get Motion from all Joysticks \$

9. Duplicate the Vertical1 array element like we did with the Horizontal1 element. Rename the new Vertical element to *Vertical2*. Change the **Negative Button** to down and the **Positive Button** to **Up**. The completed Vertical elements should look like this:

Input	(1 3
▼ Axes		
Size	20	
▶ Horizontal1		
▶ Horizontal2		
▼ Vertical1		
Name	Vertical1	_
Descriptive Name		
Descriptive Negative Name		_
Negative Button	S	
Positive Button	W	_
Alt Negative Button		_
Alt Positive Button		_
Gravity	3	_
Dead	0.001	
Sensitivity	3	
Snap		
Invert		
Туре	Key or Mouse Button	\$
Axis	X axis	+
Joy Num	Get Motion from all Joysticks	+
Vertical2		
Name	Vertical2	
Descriptive Name		
Descriptive Negative Name		
Negative Button	down	
Positive Button	up	
Alt Negative Button		
Alt Positive Button		
Gravity	3	
Dead	0.001	
Sensitivity	3	
Snap		
Invert		
Туре	Key or Mouse Button	+
Axis	X axis	÷
	Get Motion from all Joysticks	+

10. Close the Project Settings window and save the project by going to **File** > **Save Project**



11. In the Hierarchy, right-click on the Vehicle GameObject and select **Duplicate**. Rename the duplicate to *Player2*

'≔ Hierarchy			≟ -≡
Create * Q*All			
🔻 🚭 Prototype 1			*≡
河 Main Camera			
🕨 阿 OncomingVehicle			>
河 Directional Light			
🕨 河 Environment			
🕨 🏹 Vehicle			×
🕨 🥥 Obstacles	C	ору	
🕨 🕨 🜍 OncomingVehicle	P	aste	
📃 🕨 🧊 OncomingVehicle			
🕨 🕨 🜍 OncomingVehicle	R	ename	
	D	uplicate	
	D	elete	

12. Do the same with the Main Camera GameObject and rename it to Player2Cam.

'⊞ Hierarchy	<u> -</u> =
Create * Q*All	
▼ 🚭 Prototype 1*	*≡
🕖 Main Camera	
🕨 🔰 OncomingVehicle	>
🗇 Directional Light	
Invironment	
🕨 💗 Vehicle	>
▶ 🕡 Obstacles	
▶ 🧊 OncomingVehicle (1)	>
▶ 🧊 OncomingVehicle (2)	>
▶ 🧊 OncomingVehicle (3)	>
▶ 🧊 Player2	>
🗇 Player2Cam	
· · · · · · · · · · · · · · · · · · ·	

13. In the Hierarchy, select the Main Camera. In the Inspector, on the **Camera** component, change the **Viewport Rect's W** value to 0.5.

O Inspector	<u> </u> *≡
🌍 🗹 Main Camera	🗌 Static 🔻
Tag MainCamera	+ Layer Default +
▶🙏 Transform	🔟 🕸 👾
🔻 🚍 🗹 Camera	[] 과 �.
Clear Flags	Skybox +
Background	J.
Culling Mask	Everything +
Projection	Perspective +
Field of View	60
Physical Camera	
Clipping Planes	Near 0.3
	Far 1000
Viewport Rect	X 0 Y 0
	W 0.5
Depth	-1
Rendering Path	Use Graphics Settings \$
Target Texture	None (Render Texture) O
Occlusion Culling	
Allow HDR	
Allow MSAA	
Allow Dynamic Resolution	
Target Display	Display 1 +

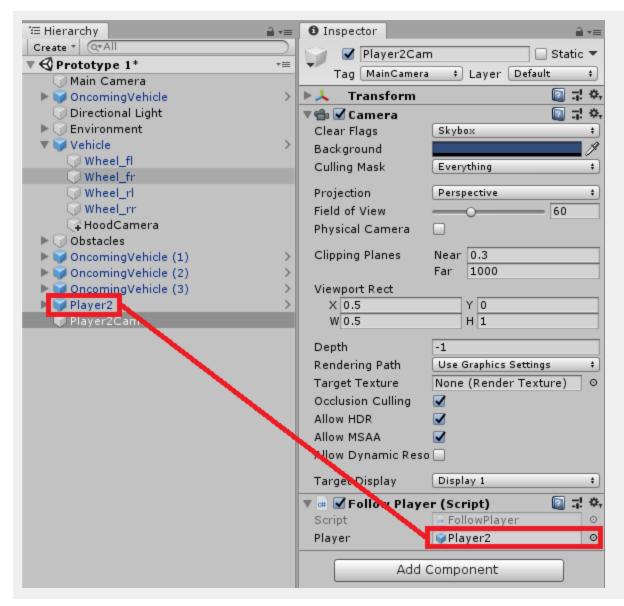
14. In the Hierarchy, navigate to the Vehicles Hood Camera. Change the **Camera** component's **Viewport Rect** to match the Main Camera.

Inspector	<u> </u>
🕤 🗹 HoodCamera	🗌 Static 🔻
Tag Untagged	tayer Default t
▶🙏 Transform	🛐 II 🔅
🔻 💼 🗌 Camera	I *
Clear Flags	Skybox +
Background	P
Culling Mask	Everything +
Projection	Perspective +
Field of View	60
Physical Camera	
Clipping Planes	Near 0.3 Far 1000
Viewport Rect	X 0 Y 0 W 0.5 4 1
Depth	0
Rendering Path	Use Graphics Settings \$
Target Texture	None (Render Texture) O
Occlusion Culling	
Allow HDR	
Allow MSAA	
Allow Dynamic Resolution	
Target Display	Display 1 +

15. In the Hierarchy, select the Player2Cam GameObject. Adjust the Camera components Viewport Rect to be 0.5 in the X and W fields. Remove the Audio Listener component by clicking on the gear and selecting Remove Component.

Inspector	a	-=
Player2Cam	🗌 Statio	•
Tag MainCamera	+ Layer Default	\$
▶↓ Transform	🗐 🖬	\$
🔻 💼 🗹 Camera		\$
Clear Flags	Skybox	+
Background		P
Culling Mask	Everything	ŧ
Projection	Perspective	+
Field of View	60	_
Physical Camera		
Clipping Planes	Near 0.3 Far 1000	_
Viewport Rect	X 0.5 Y 0 W 0.5 H 1	
Depth	-1	
Rendering Path	Use Graphics Settings	+
Target Texture	None (Render Texture)	0
Occlusion Culling		
Allow HDR		
Allow MSAA		
Allow Dynamic Resolution		
Target Display	Display 1	ŧ

16. Drag the Player2 into the Player field of the **Follow Player** component of the **Player2Cam** GameObject.



17. Select the Player2 GameObject in the Hierarchy. Drag the *Player2Cam* from the Hierarchy into the **Main Camera** field of the **Player Controller** component.

🚝 Hierarchy 🔒 📲	∎ 🖸 Inspector 🔒 📲
Create * Q*All V C Prototype 1*	🜍 🗹 Player2 🔲 Static 🔻
Main Camera	Tag Untagged ‡ Layer Default ‡
▶ 🗑 OncomingVehicle	Prefab Open Select Overrides •
🗇 Directional Light	▶ Transform 🛛 🗐 쿢 🌣
▶ 👽 Environment	▶ 🗄 ST_Veh_Ute_Red_Z (Mesh F 🛛 🗐 큐 🌣
	▶ 🖳 🗹 Mesh Renderer 🛛 🔯 큐 🌣
Wheel_fl	▶ 🔠 🗹 Mesh Collider 🛛 🚺 큐 🌣,
Wheel_rl	▶ 🍌 Rigidbody 🚺 큐 🌣
Wheel_rr	🔻 🗣 🗹 Player Controller (Script) 🛛 🔯 🕸
🗣 HoodCamera	Script 🕢 PlayerController 📀
▶ 河 Obstacles	Main Camera 💼 Main Camera) 💿
OncomingVehicle (1)	Hood Comera 🛛 🔹 HoodCamera (Camera) 💿
OncomingVehicle (2)	Switch Key F +
OncomingVehicle (3)	Input ID
Player2Cam	
- Hayer 2 dam	SimpleTown 🔯 🖬 🔅
	Shader Standard
	Add Component

Change the Switch Key to Right Shift and set the Input ID to 2. Change the X Position of Player2 to be 3.

Inspector								1	-
🍟 🗹 Player:	2						Sta	tic	•
Tag Untagge	d	÷ 1	.ay	/er 🚺	Defa	ult			+
Prefab Open		Select	:) ver	rid	es		•
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Position	X 3	}	Y	0		z	0		
Rotation	XO)	Y	0		z	0		
Scale	X 1		Y	1		Ζ	1		
▶ 📃 ST_Veh_U	Ute_	_Red_Z	(Mesh	F			킕	\$,
🕨 🛃 🗹 Mesh Renderer 🛛 🔯 🗐 🗐				\$,					
▶ 🗒 🗹 Mesh Collider 🛛 🔯 큐				\$,					
🕨 🍂 🛛 Rigidbody	у							킕	\$,
🔻 🗛 🗹 Player Co	ontr	oller (S	Sci	ript)				킕	\$,
Script		💿 Play	er	Contr	olle	r			\odot
Main Camera		🐀 Play	er	2Cam	(C	an	hera	a)	0
Hood Camera		s Hoo	dC	amer	a (0	Ca	mei	raj	0
Switch Key		Right S	hif	t					÷
Input ID		2							

19. In the Hierarchy, expand the child GameObjects of Player2 and select the Hood Camera. On the Camera component, adjust the **Viewport Rect**'s **X** and **W** values to be **0.5**.

Inspector	<u> </u>
🕤 🗹 HoodCamera	🗌 Static 🔻
Tag Untagged	tayer Default t
▶🙏 Transform	🛐 II 🔅
🔻 💼 🗌 Camera	I *
Clear Flags	Skybox +
Background	P
Culling Mask	Everything +
Projection	Perspective +
Field of View	60
Physical Camera	
Clipping Planes	Near 0.3 Far 1000
Viewport Rect	X 0 Y 0 W 0.5 4 1
Depth	0
Rendering Path	Use Graphics Settings \$
Target Texture	None (Render Texture) O
Occlusion Culling	
Allow HDR	
Allow MSAA	
Allow Dynamic Resolution	
Target Display	Display 1 +

20. Select the Vehicle in the Hierarchy. Rename it to *Player1*. Change the **X Position** on the **Transform** component to **-3**. On the **Player Controller** component, set the **Input ID** value to **1**.

Inspector							1	-≡
🍟 🗹 Player1						Sta	tic	•
Tag Untagged + Layer Default							\$	
Prefab Open	Select Override					es		•
🔻 🙏 Transform 🔤 🗐 🖬							킕	\$,
Position X -	·3	Y	0		z	0		
Rotation X 0)	Y	0		z	0		
Scale X 1		Υ	1		Z	1	_	
▶ 🧾 ST_Veh_Ute_Red_Z (Mesh F 🛛 🗐 큐							\$,	
🕨 🛃 🗹 Mesh Renderer 🛛 🔯 🖬						킕	\$,	
🕨 🧮 🗹 Mesh Collider 🛛 🔯 🖬					킕	\$,		
🕨 🎄 Rigidbody 🛛 🔯 🗐						킕	\$,	
🔻 💀 Player Controller (Script) 🛛 📓 🗐							킕	\$,
Script	PlayerController							\odot
Main Camera	📾 Main Camera (Camera						ra	0
Hood Camera	Camera 👘 HoodCamera (Camera)						0	
Switch Key	F							\$
Input ID	1							

21. Save the scene and press play. Try playing as both Player 1 and Player 2, or get someone to help test with you. Try pressing the camera switching buttons (F and Right Shift) and notice how the cameras will keep to their side of the screen.

