

# Mini Car Race Creator

Create your mini car games

Documentation.

## Where to begin :

First of all, thank you for purchasing MCR Creator.

**Step 1: IMPORTANT** : Some relevant settings are required to run properly this asset.

See Chapter [1-Configuring the project](#)

**Step 2:** Try the demo.

Open scene [Intro](#).

(Project tab : MCR Creator -> Demos -> Intro)

Default inputs are :

- Left and right arrows to turn
- Up and down arrows to accelerate and break
- H to respawn
- P for Pause
- return/enter to validate



**Step 3:** Read the next two sections in the documentation to learn the basics of MCR Creator.

[2-Tuto 1 : Create your first track](#)

[3-Tuto 2 : Customize a car](#)

**Step 4:** When you would like to create a build for your project read sections :

[6-Lighting and Optimization](#)

[7-Export to mobile](#)

If you don't find information you are looking for in the documentation contact us at : [targetsoundfx@gmail.com](mailto:targetsoundfx@gmail.com)

Note : After testing the asset, we really appreciate if you could post a review on the assets store. It helps us to be visible on the store. Thanks for reading. Have fun with MCR Creator.

Best regards,  
Pierre from TargetStudio.

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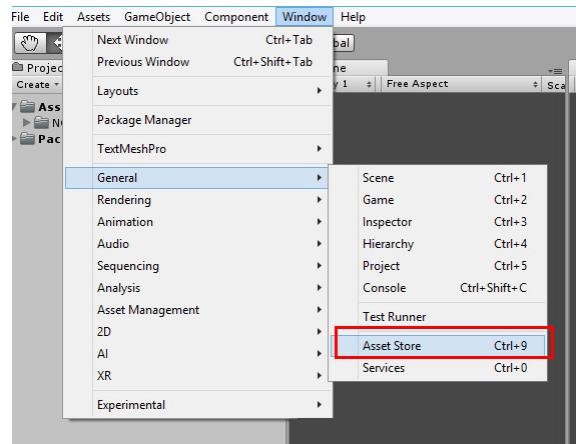
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## 1 Configuring the project :

### Import Unity Standard Assets:

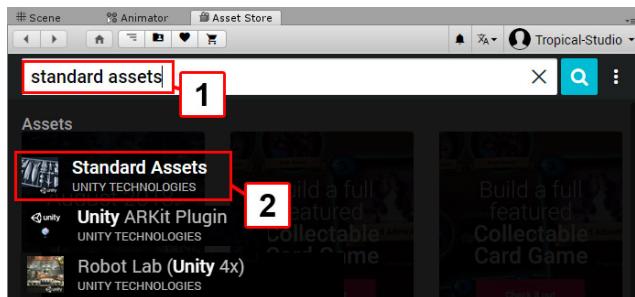
1 Go to Window → General → Asset Store

2 You need to log in

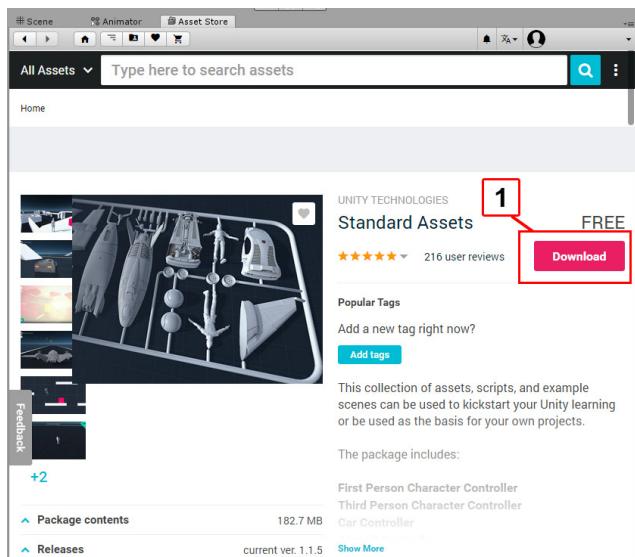


2 Search Standard assets (spot1)

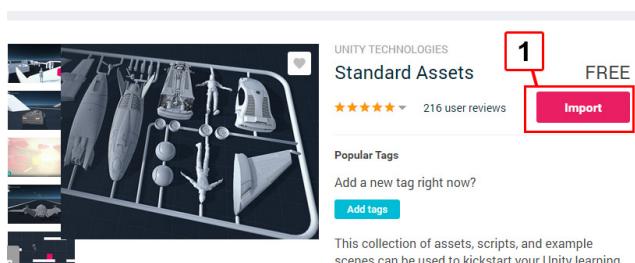
3 Press on Standard assets icon (spot2)



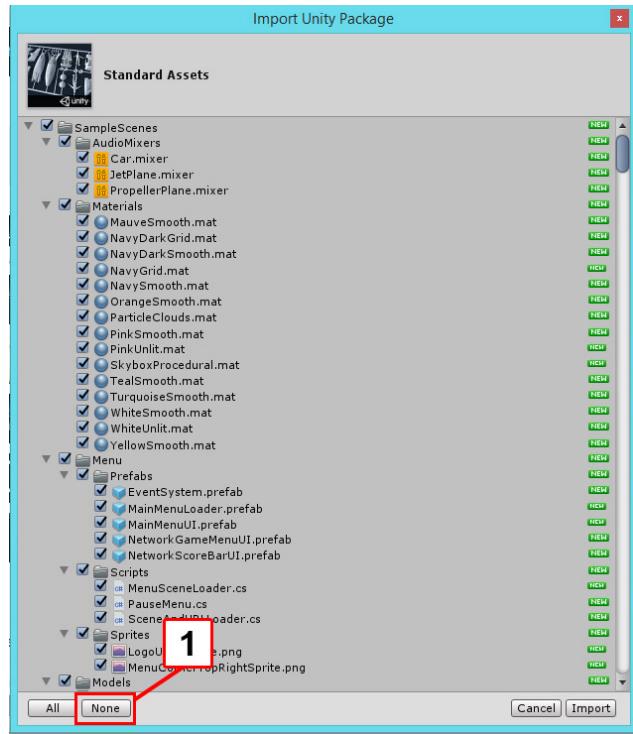
4 Press button Download (spot1)



5 Press button Import (spot1)

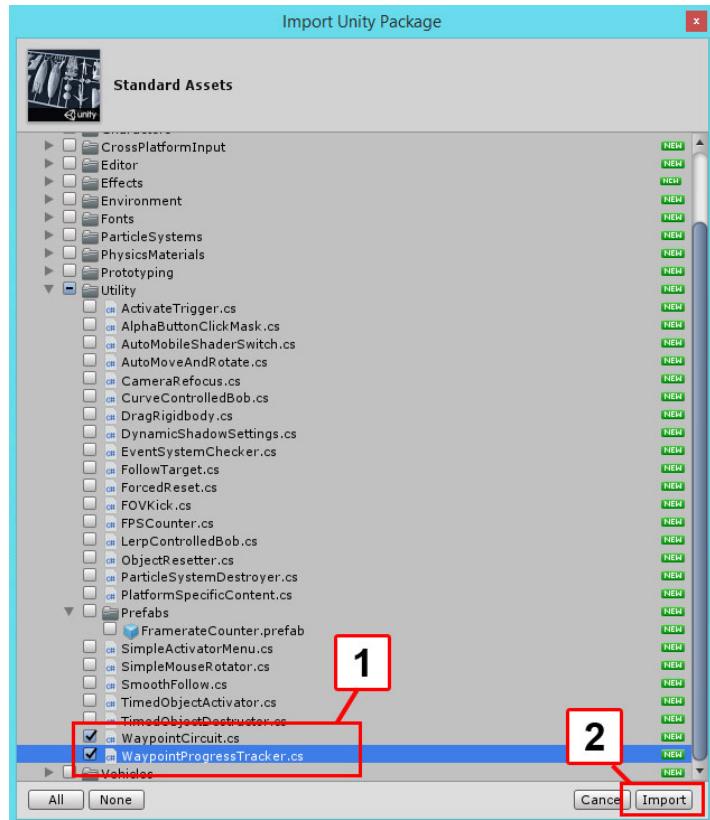


6 Press button **None** to deselect all (spot1)

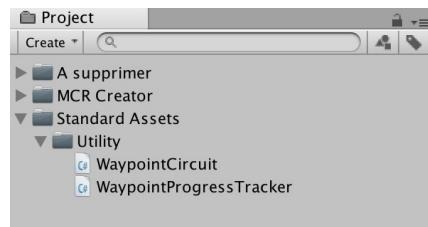


7 In **Utility** folder select **WaypointCircuit.cs** + **WaypointProgressTracker.cs** (spot1)

8 Press **Import** button (spot2)



A new folder that contain the two scripts is created on the project folder



## MCR Creator is now setup.

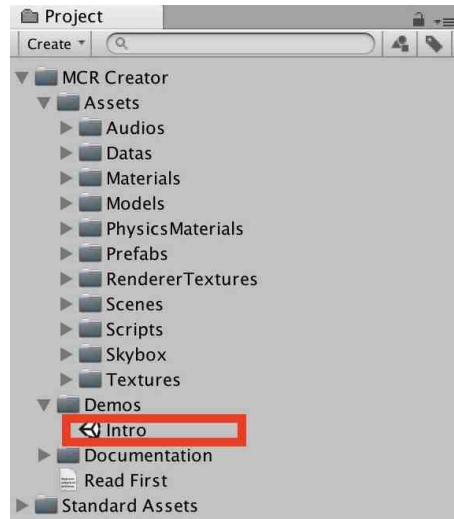
You could open the scene **Intro** to test the demo.

Project Tab : MCR Creator → Assets → Demo → Intro

After testing the demo, we suggest you to read **Tuto 1** and **Tuto 2** to learn how to easily create a track and how to create your cars with MRC Creator.

When you would like to export your project (create a build) we suggest you to read section :

- 6- Lighting and optimizations**
- 7- Export to mobile**



## 2-Tuto 1 : Create your first track

### 2.1- Create the track

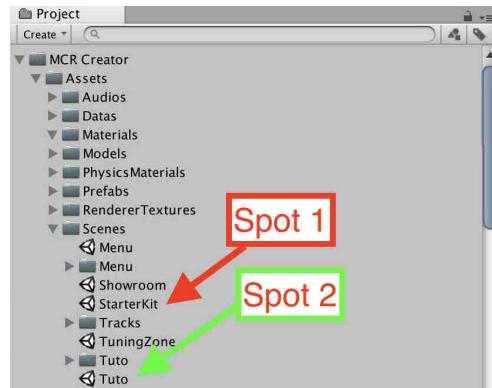
1- Duplicate scene **StarterKit** (spot 1) :

Project Tab : MCR Creator → Assets → Scenes → StarterKit

2- Rename it (spot 2) :

Tuto

3- Open scene **Tuto**

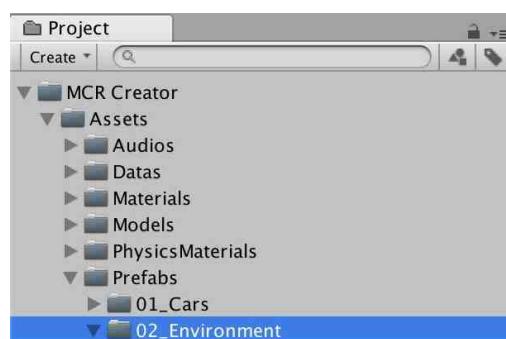


To create your track you could use ready to use prefabs

1- Open the folder **02\_Environment** :

Project Tab : MCR Creator → Assets → Prefabs → 02\_Environment

In this folder you find all the ready to use prefabs to create tracks easily.

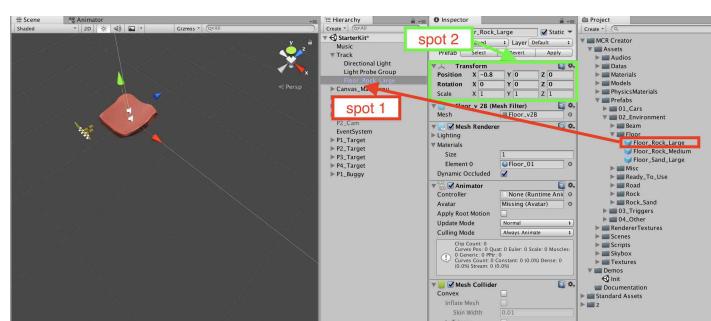


2- Drag and drop the prefab

**Floor\_Rock\_Large**

inside gameObject **Track** on the Hierarchy  
(spot 1)

Project Tab : MCR Creator → Assets → Prefabs → 02\_Environment → Floor → Floor\_Rock\_Large



3- Change the **Floor\_Rock\_Large** position to (spot 2):

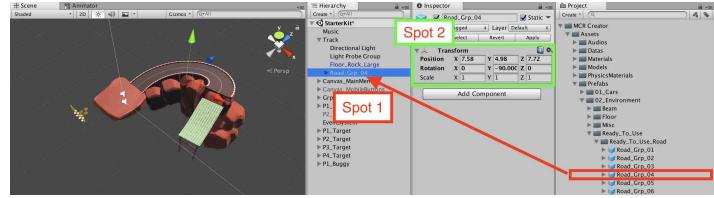
Position : X = -0.8    Y = 0    Z = 0

Rotation: X = 0    Y = 0    Z = 0

Scale : X = 1    Y = 1    Z = 1

4- Drag and drop the prefab **Road\_Grp\_04** inside gameObject **Track** on the Hierarchy (spot 1)

Project Tab : MCR Creator → Assets → Prefabs → 02\_Environment → ReadyToUse → ReadyToUseRoad → Road\_Grp\_04

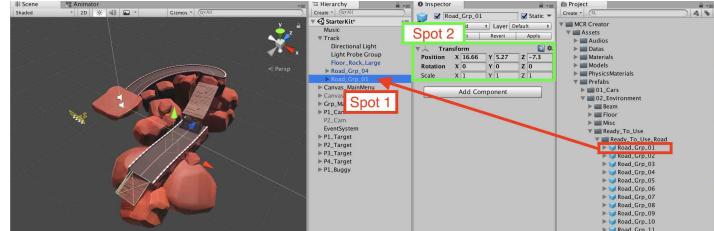


5- Change the **Road\_Grp\_04** position to (spot 2):

Position : X = 7.58 Y = 4.98 Z = 7.72  
Rotation: X = 0 Y = -90 Z = 0  
Scale : X = 1 Y = 1 Z = 1

6- Drag and drop the prefab **Road\_Grp\_01** inside gameObject **Track** on the Hierarchy (spot 1)

Project Tab : MCR Creator → Assets → Prefabs → 02\_Environment → ReadyToUse → ReadyToUseRoad → Road\_Grp\_01



7- Change the **Road\_Grp\_01** position to (spot 2):

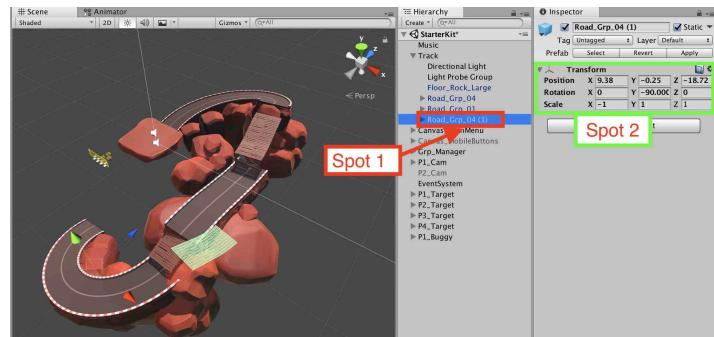
Position : X = 16.66 Y = 5.27 Z = -7.3  
Rotation: X = 0 Y = 0 Z = 0  
Scale : X = 1 Y = 1 Z = 1

8- Duplicate **Road\_Grp\_04** (spot 1) (Ctrl+D or Command+D)

A new gameObject is created named **Road\_Grp\_04 (1)**

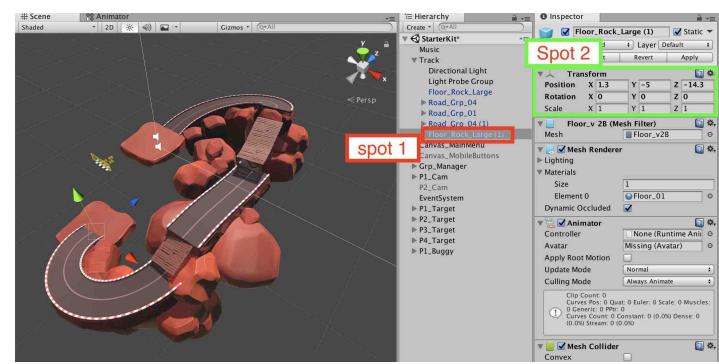
9- Change the **Road\_Grp\_04 (1)** position to (spot 2):

Position : X = 9.38 Y = -0.25 Z = -18.72  
Rotation: X = 0 Y = -90 Z = 0  
Scale : X = -1 Y = 1 Z = 1



## 10- Duplicate Floor\_Rock\_Large (spot 1) (Ctrl+D or Command+D)

A new gameObject is created named Floor\_Rock\_Large (1)

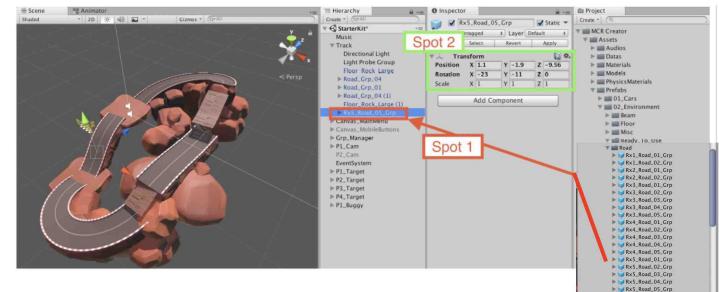


## 11- Change the Floor\_Rock\_Large (1) position to (spot 2):

Position : X = 1.3 Y = -5 Z = -14.3  
 Rotation: X = 0 Y = 0 Z = 0  
 Scale : X =1 Y = 1 Z = 1

## 12- Drag and drop the prefab Rx5\_Road\_05\_Grp inside gameObject Track on the Hierarchy (spot 1)

Project Tab : MCR Creator → Assets → Prefabs → 02\_Environment → Road → Rx5\_Road\_05\_Grp

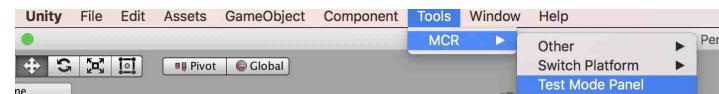


## 13- Change the Rx5\_Road\_05\_Grp position to (spot 2):

Position : X = 1.1 Y = -1.9 Z = -9.56  
 Rotation: X = -23 Y = -11 Z = 0  
 Scale : X =1 Y = 1 Z = 1

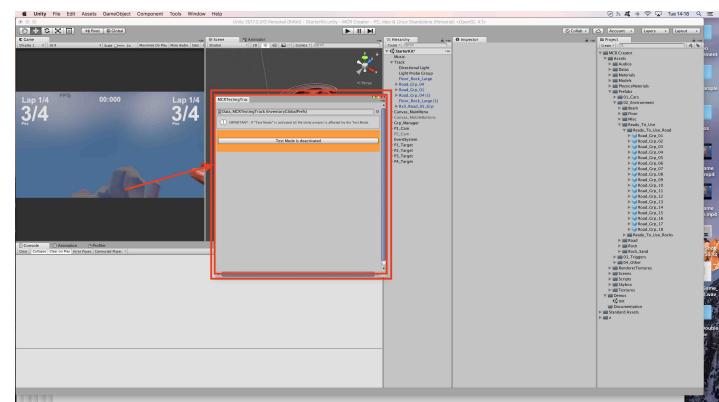
## 2.2- Test the track

### 1- Open Menu : Tools → MCR → Test Mode Panel



A new window appears.

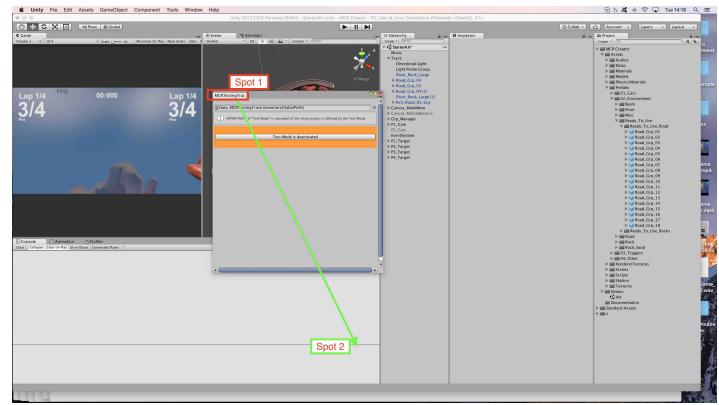
It is easier to have this window always visible on your Layout.



2- Click on the name of the tab (Spot 1)

3- Then drag the window on spot 2.

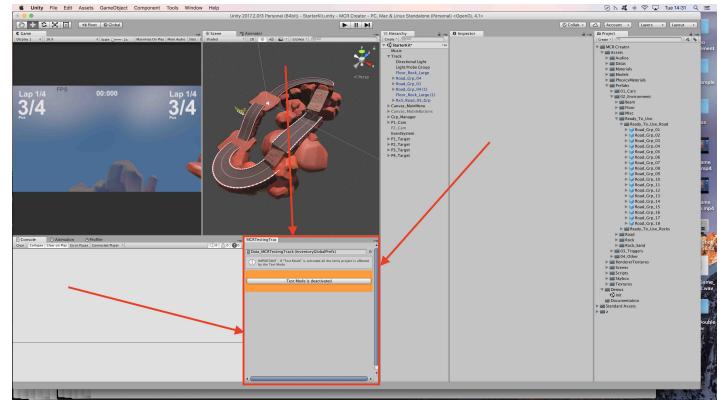
4- Then release the mouse button.



The tab is now attached to the layout

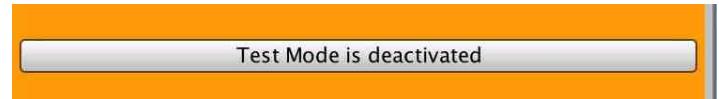
More info here :

<https://docs.unity3d.com/Manual/CustomizingYourWorkspace.html>



This tab is used to activate or deactivate the **Test Mode**.

5- Press button **Test Mode is deactivated**



The button text change to : **Test Mode is activated**.  
Some options appears on window.

6- Press button **Apply** (spot 1) to create a car on the Hierarchy manage by Player 1

A new car is created on the Hierarchy named "P1\_Buggy"



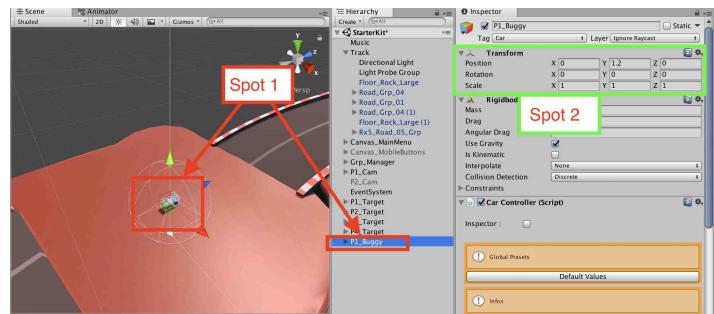
7- Select the car **P1\_Buggy** on the Hierarchy (spot 1)

8- Change his position to (spot 2)

Position : X = 0 Y = 1.2 Z = 0

Rotation: X = 0 Y = 0 Z = 0

Scale : X = 1 Y = 1 Z = 1



9- Press the button **play** to start the scene



*By default inputs are :*

**Left** : Left arrow

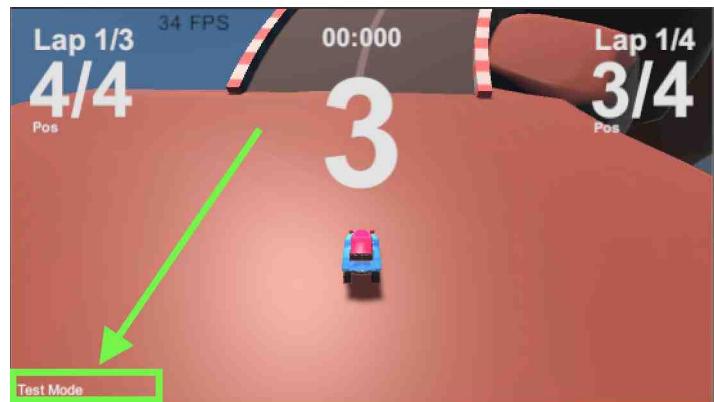
**Right** : Right arrow

**Acceleration** : Up arrow

**Break** : Down Arrow

As you could see when the scene start on the bottom left **Test Mode** is displayed on screen.

*If test Mode is not activated no text is displayed on screen*



### 2.3- Create AI path and Respawn points

We are going to create a path.

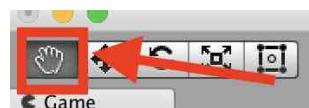
*Path is needed because :*

- Car AI follow this path.

- Respawn system use the path to respawn cars.

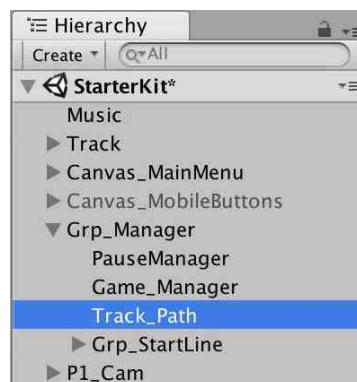
1- Press the hand icon to select the **Hand tool**

(shortcut: **Q**),

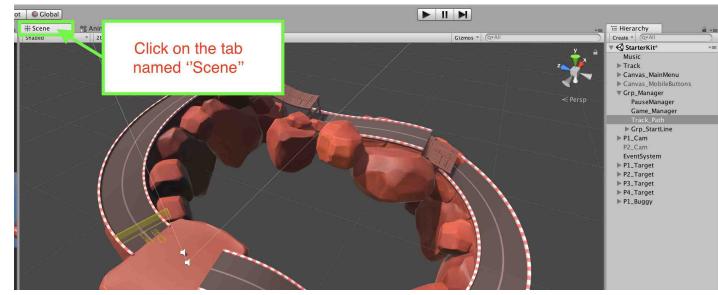


2- On hierarchy select **Track\_Path**

*Hierarchy : Grp\_Manager → Track\_Path*



3- Click on the tab named **scene** to select the Scene tab



4- Move your Mouse inside the **Scene Tab** and  
Press key button **F** to activate the focus mode.

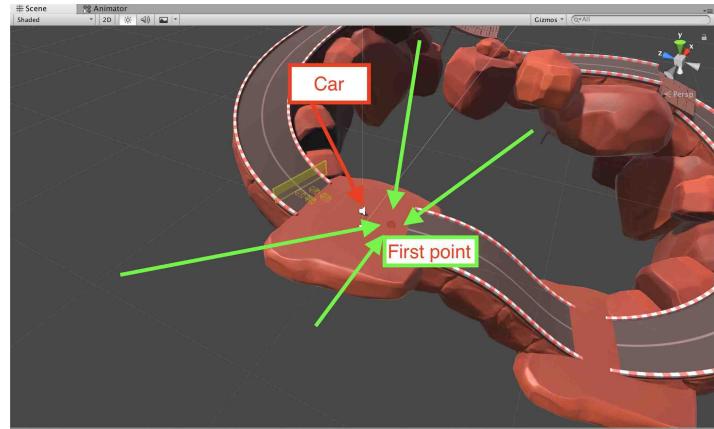
5- Put your mouse near the car on scene view then press keyboard **J** button to create your first path point.

This first point is used to know where the race start.

#### Important :

Points are created only if there is a `gameObject` under the mouse position.

Points are used to create respawn positions. Best practice :  
- Add your points on roads  
- Not too close from a jump zone  
- Not on a cliff

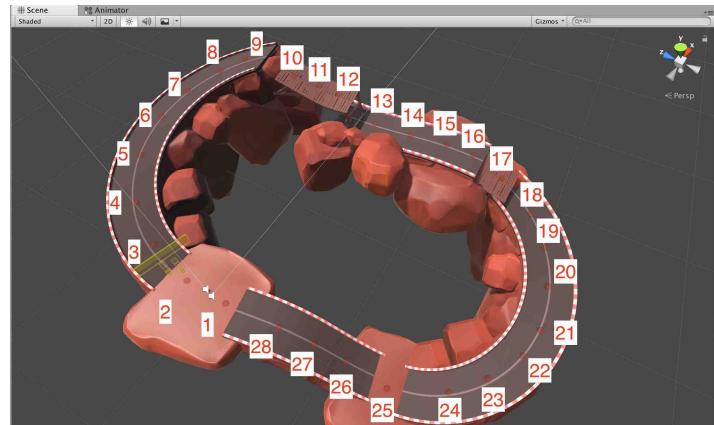


6-Create all the other path points for this tracks. Press **J** on track where you want.

Here we have created 28 points.

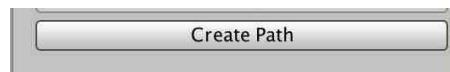
#### Info:

- Use the hand tool to move on scene and create easily all the points.
- It is possible to delete a point.
- If you lose the focus go **step 2**



7- On hierarchy select **Track\_Path**  
*Hierarchy : Grp\_Manager → Track\_Path*

Press button **Create Path** on the Inspector.



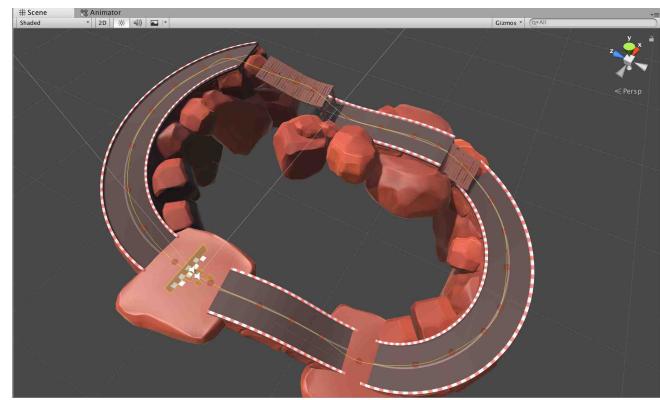
Your path is created (The yellow line)

The Start Line is automatically moved to the first path position.

More info about Path Tips [here](#)

**Info :**

You need to open the script "Waypoint Circuit" on the Inspector to visualize the yellow line



**Info :** You could have this warning message on the Console tab :

**Retrieving array element that was out of bounds**

```
253 if (items.arraySize > 0)
254 {
255     for (int i = -1; i < items.arraySize; ++i)
256     {
257         var item = items.GetArrayElementAtIndex(i);
```

It is optional but if you want to remove this message open the script : WaypointCircuit.cs on your script editor.

Project Tab : Standard Assets → Utility → WaypointCircuit.cs

Line 255 change :

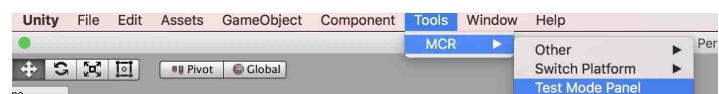
```
for(int i = -1; i < items.arraySize; ++i)
to
for(int i = 0; i < items.arraySize; ++i)
```

## 2.4- Test the track with AI

If **Test Mode Panel** is on your Window layout go to **step 2**.

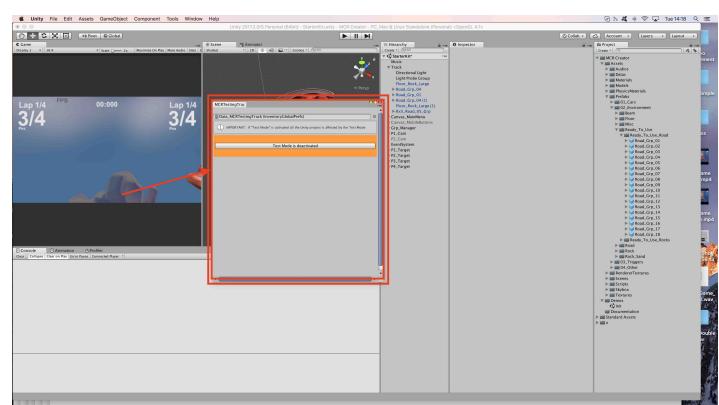
### Step 1 :

1- Open Menu : Tools → MCR → Test Mode Panel

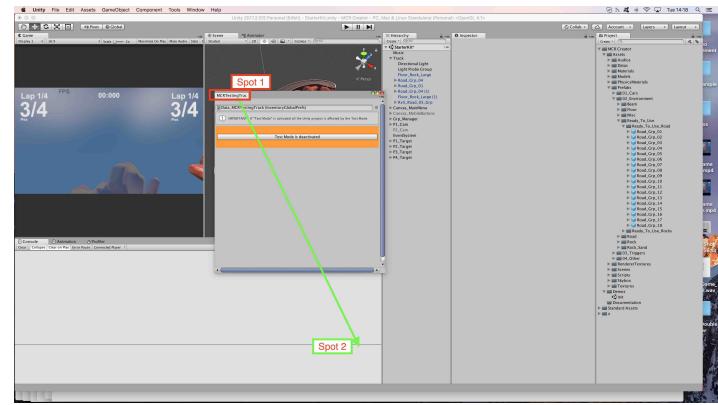


A new window appears.

It is easier to have this window always visible on your Layout.

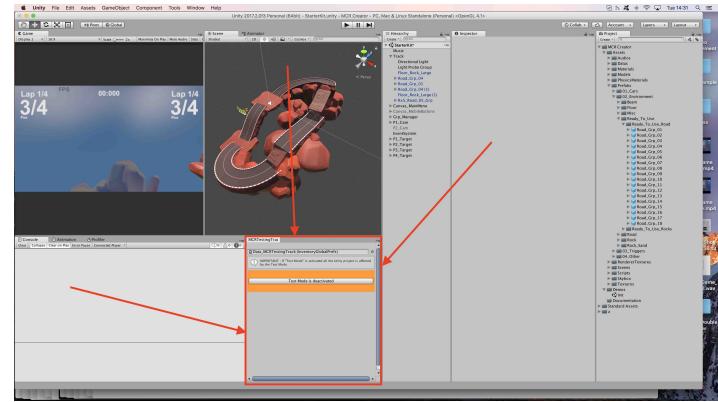


- 2- Click on the name of the tab (Spot 1)
- 3- Then drag the window on spot 2.
- 4- Then release the mouse button.



The tab is now attached to the layout

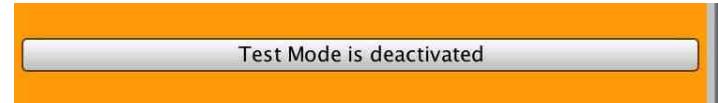
More info here :  
<https://docs.unity3d.com/Manual/CustomizingYourWorkspace.html>



## Step 2:

If Test Mode is deactivated

- 1- Press button **Test Mode is deactivated**



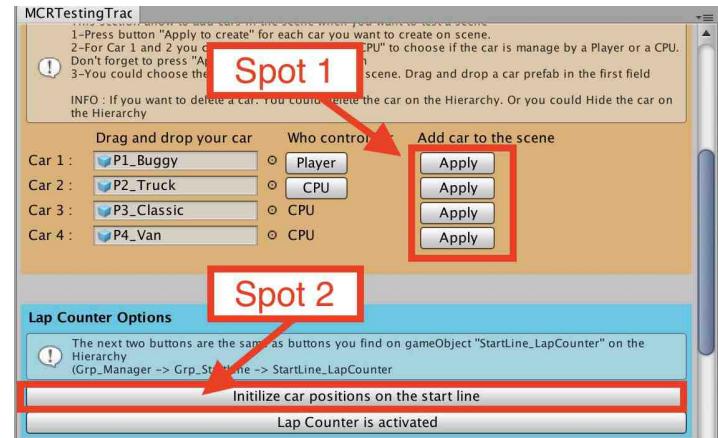
The button text change to : **Test Mode is activated**.  
 Some options appears on window.

- 2- Press on each button **Apply** (spot 1) to create cars on the Hierarchy

New cars are created on the Hierarchy named

"P1\_Buggy" : Player 1  
 "P2\_Truck" : CPU 1  
 "P3\_Classic" : CPU 2  
 "P\_Van" : CPU 3

- 3- Press Button **Initialize car positions on the start line**



- 4- Press the button **play** to start the scene



## 2.5- Create respawn trigger zones

We are going to add a respawn trigger zone to respawn a car if this car goes out of the road.

1- Drag and drop the prefab

**Respawn\_Collider** on the Hierarchy.

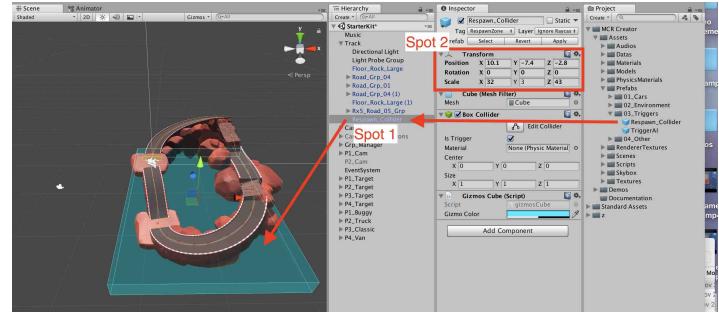
Project tab : MCR Creator → Assets → Prefabs → 03\_Triggers → Respawn\_Collider

2- Change his position and scale to (spot 2)

Position : X = 10.2 Y = -7.4 Z = -2.8

Rotation: X = 0 Y = 0 Z = 0

Scale : X = 40 Y = 3 Z = 43



3- Press the button **play** to start the scene



Try to go out the road with your car.

When your car enter on collision with the Respawn\_Collider your car is respawned on track.

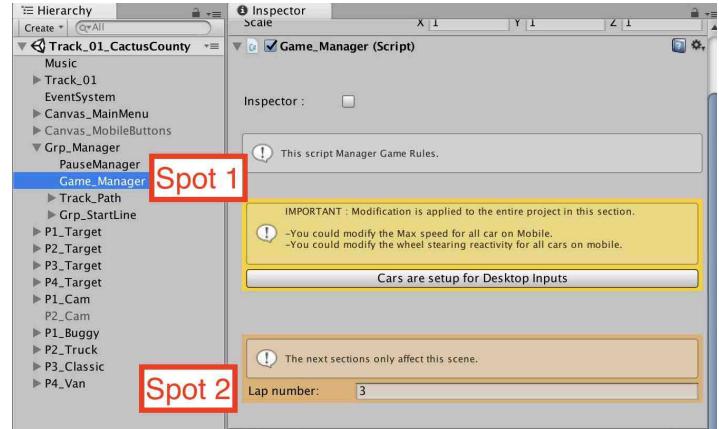
## 2.6 Choose the number of laps

1- On the Hierarchy Select

**Game\_Manager** (spot 1)

Hierarchy tab : Grp\_Manager → Game\_Manager

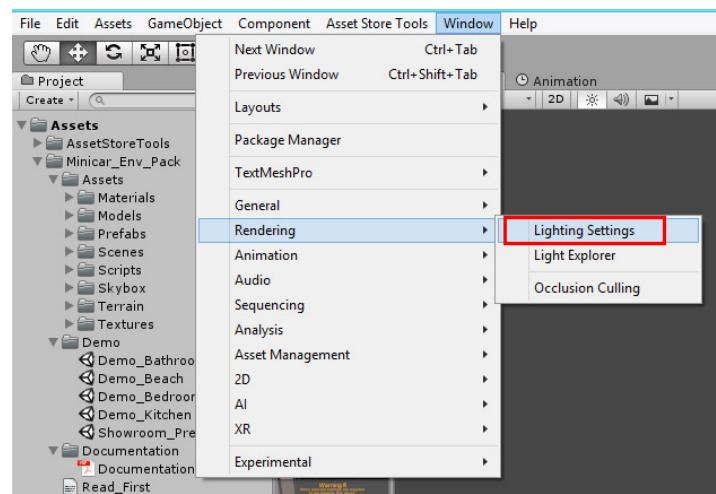
2- On the Inspector change the number of Lap for this track (spot 2)



## 2.7 Generate Lightmaps

This step is optional. But it help to optimize game performance.

1- Go to : **Window** → **Rendering** → **Lighting settings** to open the Lighting tab

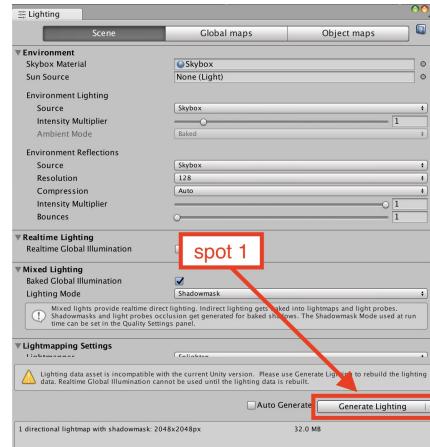


A new window appears on screen.

2- Press button **Generate Lighting** (spot 1) to generate the lightmap for this scene.

Info : Generate the lightmap is about 5-10 minutes

More info about how to create Lightmap [here](#) :

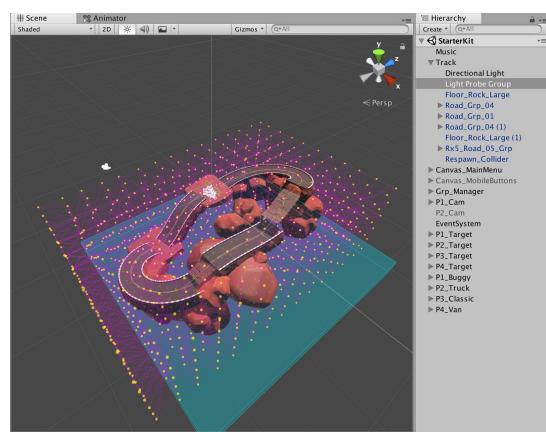


## 2.8 Light Probes.

Light probes are used to provide lighting on moving objects (cars, cone signaling ...).

There is a ready to use light probe on the starterKit scene.

**More about how to create your Light Probe [here](#)**



## 2.9 Add track to the main track list.

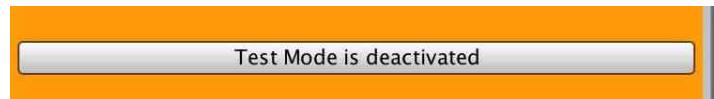
### 1- Open TrackTuto1

Project Tab : Assets → Scenes → Tuto → *TrackTuto1*

### 2- If Test Mode is activated

Press button **Test Mode is activated**

The button text change to : **Test Mode is deactivated**.

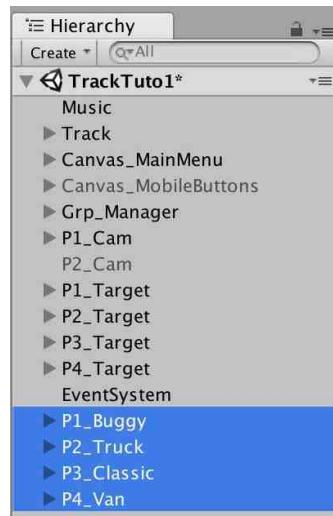


- **IMPORTANT** : Cars are not destroyed when **Test Mode** is deactivated.

**You need to destroy them manually.**

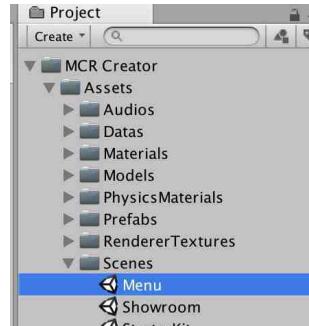
### 3- Select the cars on the Hierarchy then delete them.

*If the game is not running on "Test Mode" when the game starts the cars on scene are automatically destroyed and replaced by the needed cars selected on main menu car selection*



### 4- Open scene Menu :

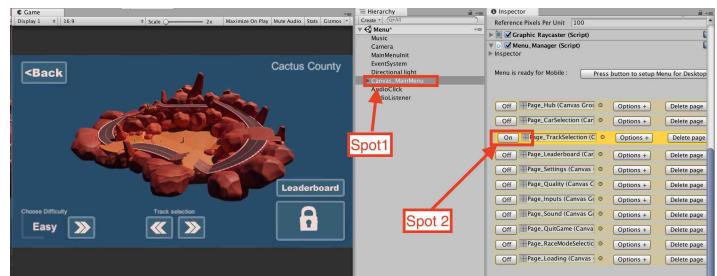
Project Tab : MCR Creator → Assets → Scenes → *Menu*



5- On the Hierarchy select **Canvas\_MainMenu** (spot 1)  
**Hierarchy tab : Canvas\_MainMenu**

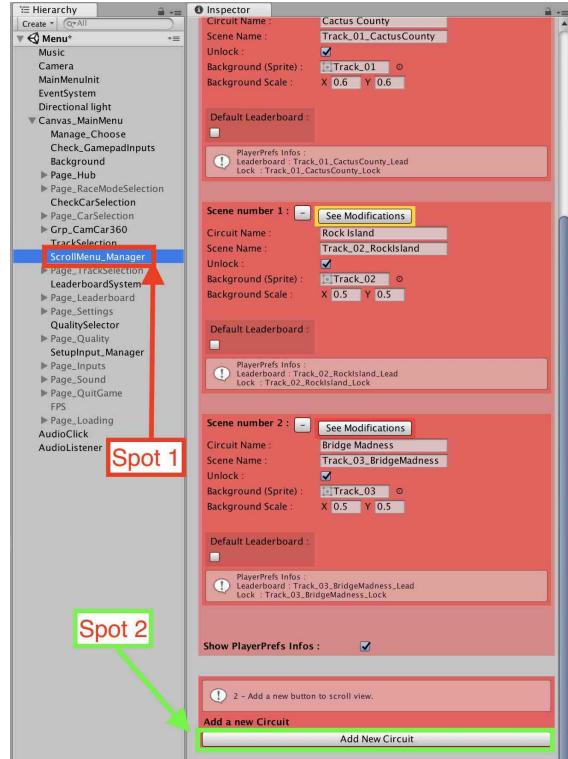
7- On the Inspector Press button **Off** (Spot 2) to display the track menu page.

**More about how to use Menu Manager here**

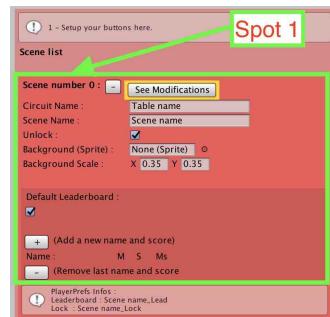


8- On the Hierarchy select **ScrollMenu\_Manager** (spot 1)  
**Hierarchy tab : Canvas\_MainMenu → ScrollMenu\_Manager**

9- On the Inspector go to the end of the scroll view and press button **Add a new Circuit**



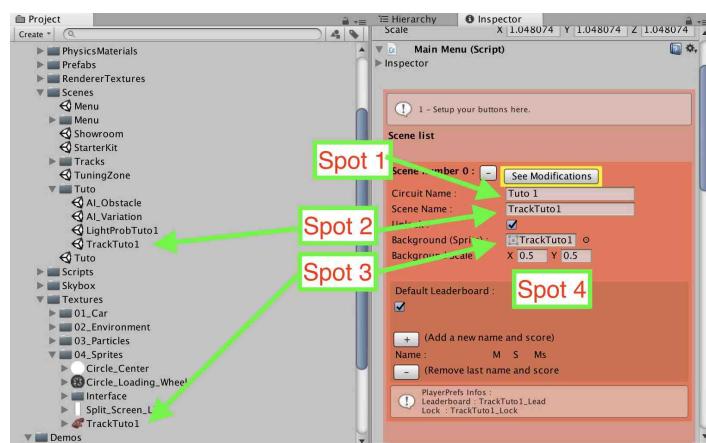
10- On the Inspector go to the top of the scroll view. A new empty Slot **Scene number 0** is created.



11- Change circuit name (spot 1) to :

Tuto 1

(you could choose the name you want)



12- Change Scene name (spot 2) to :

TrackTuto1

(you need to choose the same name as the scene you want to use on Project Tab)

13- Choose a sprite for your track (spot 3):

In our example drag and drop the sprite

TrackTuto1

Project tab : MCR Creator → Assets → Textures → 04\_Sprites → TrackTuto1

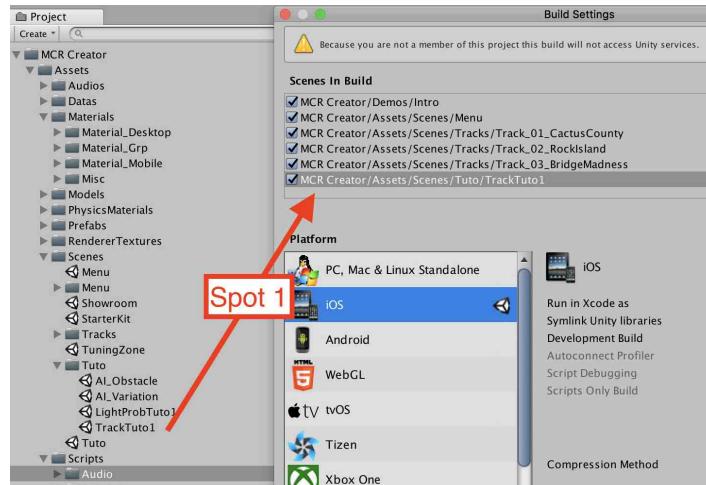
14- Change scale sprite to (spot 4) :

X=0.5 Y=0.5

15- Go to : File → Build Settings



16- Drag and drop TrackTuto1 from the project tab to the Scenes in build window (spot 1)



TrackTuto1 scene is now setup and could be choose on track selection page

**IMPORTANT** : When you test your scene don't forget to check if **Test Mode** is deactivated.

(More info on Step 2)

## 3-Tuto 2 : Customize a car

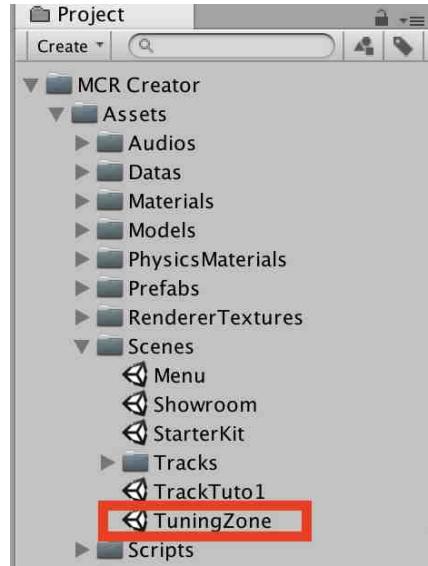
### 3.1 Change car models :

#### 1- Open scene Tuning Zone

Project tab : MCR Creator → Assets → Scenes → TuningZone

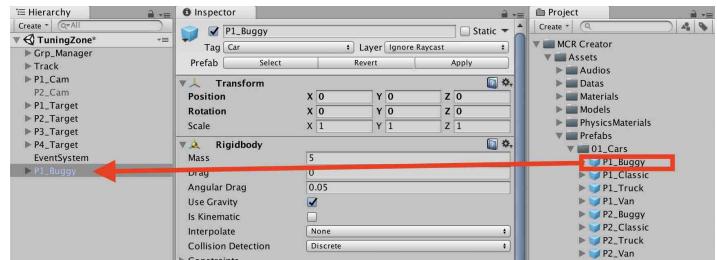
We have created this scene to test car modification but you could customize your car in every scene if TEST MODE is activated.

**Info :** Respawn system doesn't work on this scene. If your car can't move, restart the scene



#### 2- Drag and drop P1\_Buggy from the project folder to the Hierarchy (spot 1)

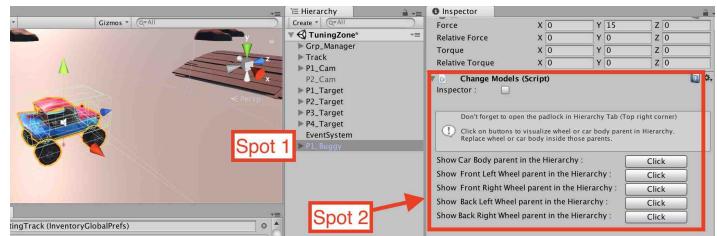
Project tab : MCR Creator → Assets → Prefabs → 01\_Cars → P1\_Buggy



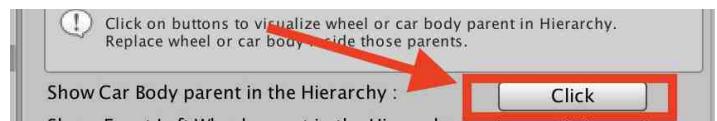
#### 3- Select P1\_Buggy on the Hierarchy (spot 1)

On the Inspector : At the end of the scroll view there is the script Change Models.

This script helps finding Wheels and body car 3D models in the Hierarchy tab.



#### 4- Press Button Click beside text "Show car body parent in the Hierarchy"

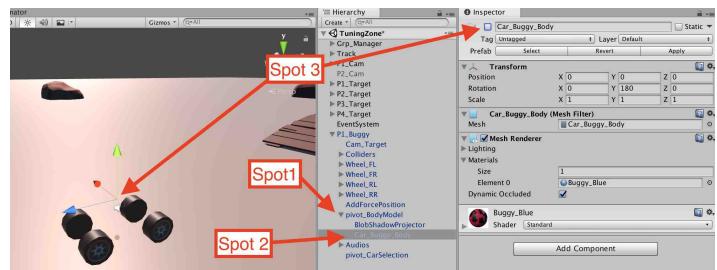


The group that contain 3D body models is selected

#### 5- Open the group (Spot 1)

#### 6- Select the car body (spot2)

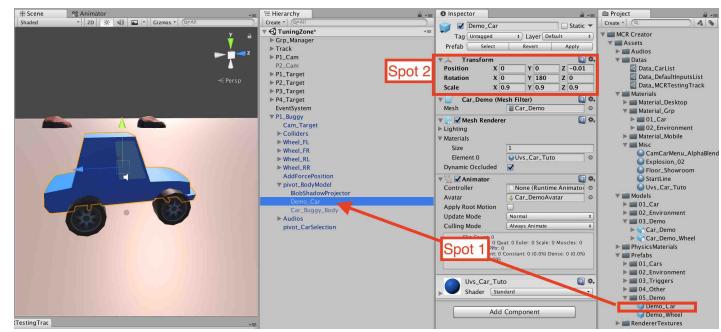
#### 7- Deactivate or delete the Car\_Buggy\_Body (spot 3)



8- Drag and drop **Demo\_Car** inside the group **pivot\_BodyModel** (spot 1).  
 Project tab : MCR Creator → Assets → Prefabs → 05\_Demo → Demo\_Car

9- Change **Demo\_Car** position, rotation and scale (spot 2):

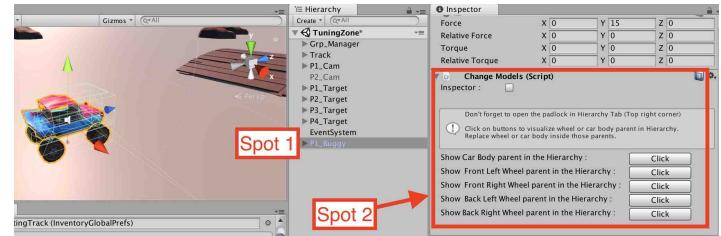
Position : X =0 Y = 0 Z = -0.01  
 Rotation: X = 0 Y = 180 Z = 0  
 Scale : X =0.9 Y = 0.9 Z = 0.9



10- Select **P1\_Buggy** on the Hierarchy (spot 1)

On the Inspector : At the end of the scroll view there is the script **Change Models**.

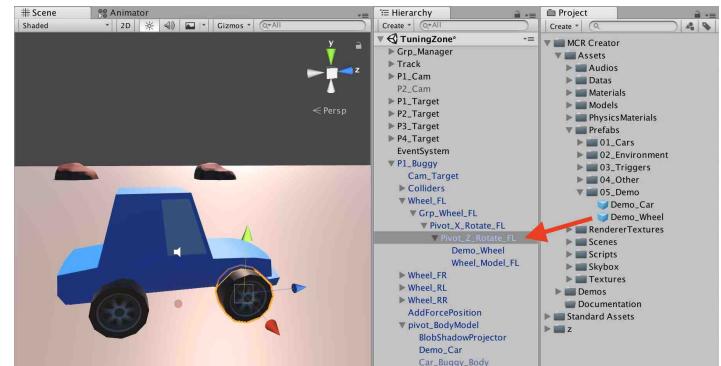
This script helps finding Wheels and body car 3D models in the Hierarchy tab.



11- Press Button **Click** beside text "Show Front Left Wheel parent in the Hierarchy" →

Show Front Left Wheel parent in the Hierarchy :

12- Drag and drop **Demo\_Wheel** inside the group **Pivot\_Z\_Rotate\_FL** (spot 1).  
 Project tab : MCR Creator → Assets → Prefabs → 05\_Demo → Demo\_Wheel



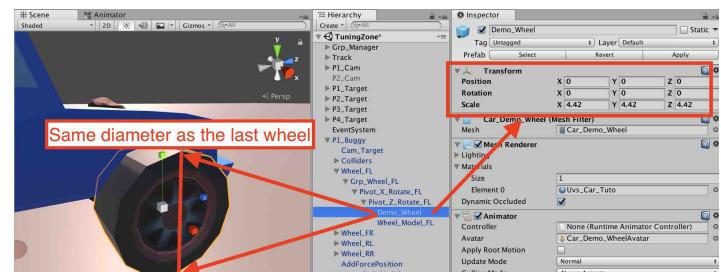
### Very Important :

- The diameter of the new wheel need to be same as **Wheel\_Model\_FL** to avoid visual collision between wheel and ground.

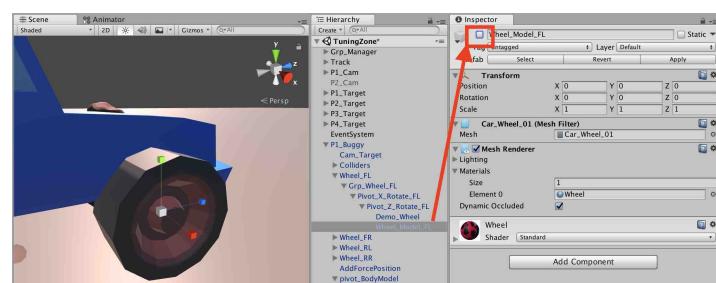
So in our example :

13- Change **Demo\_Wheel** position, rotation and scale:

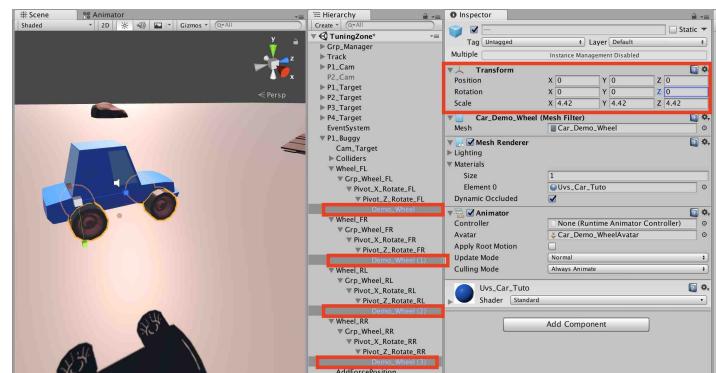
Position : X =0 Y = 0 Z = 0  
 Rotation: X = 0 Y = 0 Z = 0  
 Scale : X = 4.42 Y = 4.42 Z = 4.42



#### 14- Deactivate or delete Wheel\_Model\_FL



15- Do the same operation for the other three wheels (step 11 to 13).



### 3.2 Modify car parameters :

1- Select P1\_Buggy on the Hierarchy  
(spot 1)

On the Inspector :

The script **Car Controller** manage the car.

**Default values** : reset the car parameters



**Max Speed** : Max speed for the car

**Wheel steering reactivity** : reactivity when left and right is pressed.

**Car rotation speed** : car rotation speed



**Spring Height** : Change the height of car spring



**Damper and Spring Stiffness** : how smooth is car spring



**Rear wheels distance** : local X Axis

Wheels Options

Rear Wheels Distance : 0.084

Front Wheels Distance : 0.084

**Front wheels distance** : local X Axis

**Length wheels distance** : local Z Axis

Length Wheels Distance : 0.127

**Global Wheel size** : all the wheels are scaled at the same time

Global Wheel Size : 0.265

Rear Wheel Size : 0

Front Wheel Size : 0

**Rear Wheel size** : Rear wheels are scaled

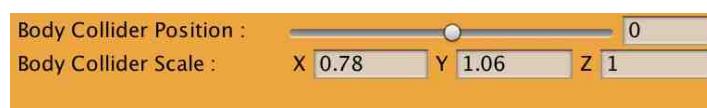
**Front Wheel size** : Front wheels are scaled

**Body Model Z Position** : local Z Axis.  
Move the group **pivot\_BodyModel**

Car Body Options

Body Model Z Position : 0

**Body Collider Position** : local Z Axis.  
Move the group **Pivot\_BodyCollider**



Body Collider Position : 0

Body Collider Scale : X 0.78 Y 1.06 Z 1

**Body Collider Scale** : Scale the group **Pivot\_BodyCollider**

**Center of Mass Z Axis** : local Z Axis.

Center Of Mass Z Axis : -0.0119

**Offset Z Axis** : Change for the **gameObject pivot\_CarSelection** used as a pivot on Menu Car Selection.

Offset for gameObject use as a pivot on Menu car selection

Offset Z Axis : 0

Audio volume options

Audio Options :

! – Drag and drop audio clip for each type of sound  
– Change volume for each type of sound

Acceleration : MotorEngine\_Loop\_07

Volume : 0.2

Skid : Skid\_25

Volume : 0.6

Impact : Impact\_03

Volume : 0.3

**Rotation** : When the car turn left or right a fake rotation is apply to the car body group.

Adjust the left right body car movement

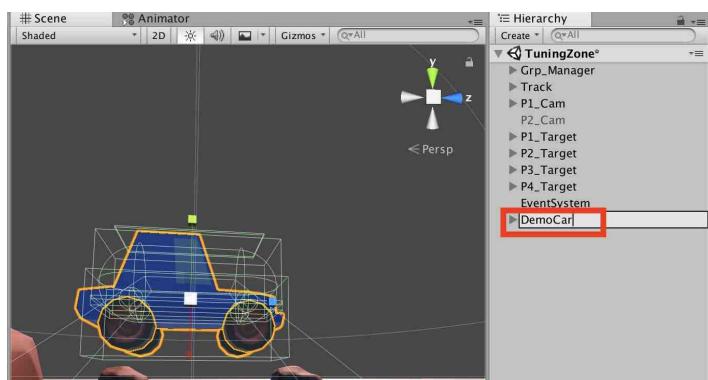
Rotation : 5

### 3.3 Save the car :

1- Select P1\_Buggy on the Hierarchy

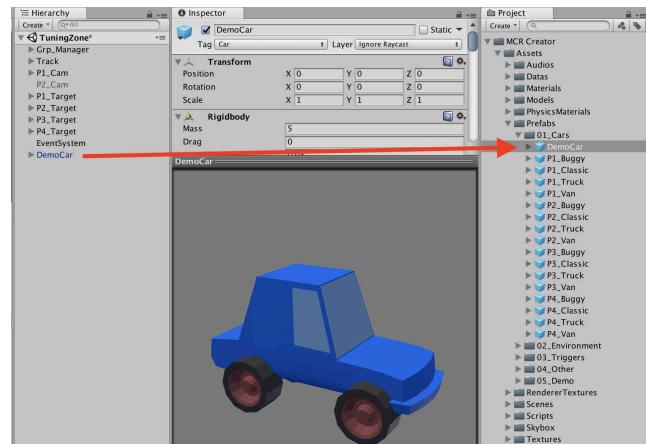
2- Rename it :

For this example name the car DemoCar



3- Drag and drop DemoCar from the Hierarchy to the folder 01\_Car on the Project tab

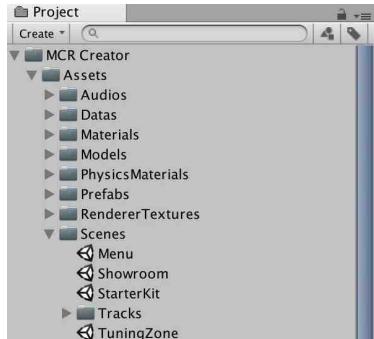
Project tab : MCR Creator → Assets → Prefabs → 01\_Cars



### 3.3 Add car to the main menu car List :

1- Open Menu scene :

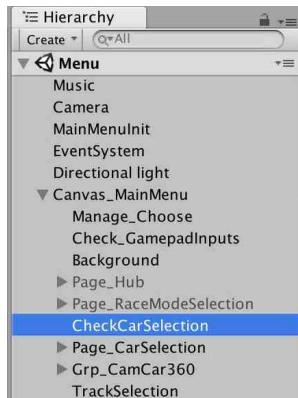
Project tab : MCR Creator → Assets → Scenes → Menu



2- On the Hierarchy select

CheckCarSelection

Hierarchy tab : Canvas\_MainMenu → CheckCarSelection



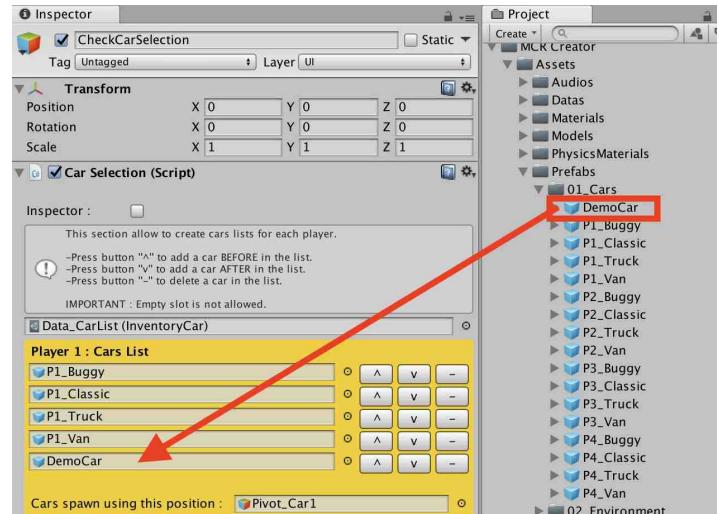
We are going to add our car on Player 1 car list but you could do the same for player 2,3,4

3- Press the button V to add new slot at the end of the list (spot 1)



4- Drag and drop DemoCar inside the empty slot

Now this car could be selected by the player 1



## 4-Tuto 3 : Setup and/or modify car AI

### 4.1 AI parameters :

*It is possible to modify the AI behavior for each track scene.*

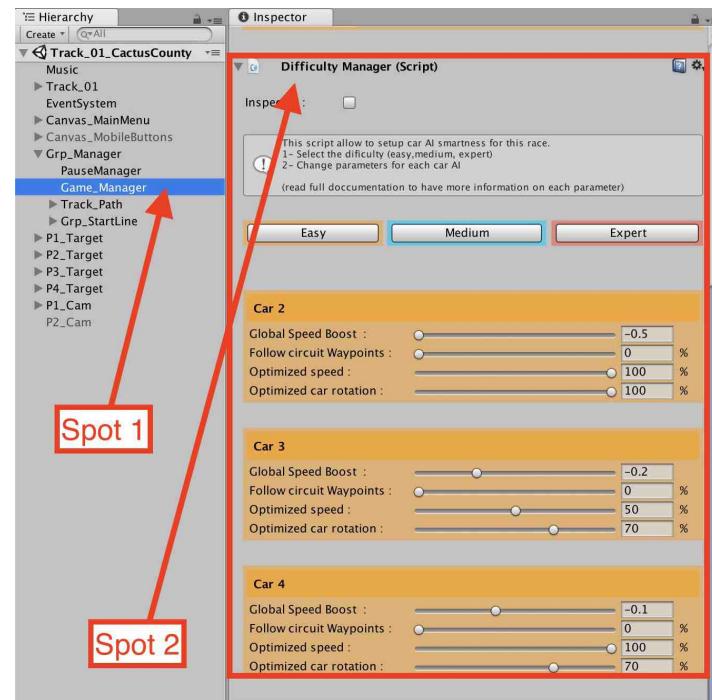
1- Open a track scene (for example StarterKit scene)

Project tab : MCR Creator → Assets → Scenes → StarterKit

2- In the Hierarchy select Game\_Manager (spot 1)

Hierarchy tab : Grp\_Manager → Game\_Manager

3- In the Inspector go to Difficulty Manager section (spot 2)



*It is possible to setup AI for difficulty mode.*

4- Press Button Easy, Medium or Expert to see parameters for each difficulty.



You could modify AI for Car 2,3 and 4.

**Global Speed Boost :** add a speed offset (negative or positive)

**Follow Circuit Waypoints :**

0 = the car do not follow the path very well.

100 = the car follow the path very well.

**Optimized speed :**

0 = car do not always reach the max speed.

100 = the car always reach the max speed.

**Optimized car rotation :**

0 = car do not always reach the best car rotation.

100 = the car always reach the best car rotation.

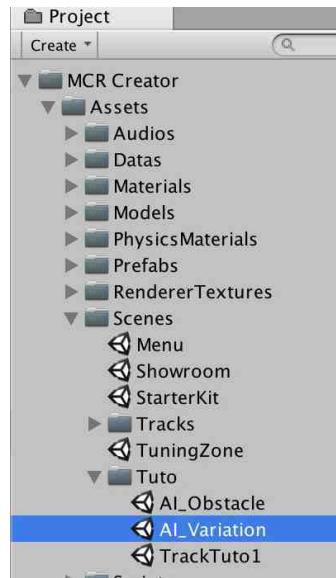


## 4.2- Tweak AI reaction

In this section we are going to show how to force car AI reaction.

### 1- Open scene **AI\_Variation** on Project tab

Project tab : MCR Creator → Assets → Scenes →  
Tuto → AI\_Variation

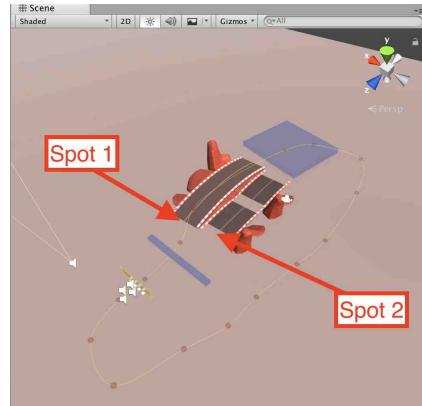


In this example we are going to show how to force car AI to choose between :

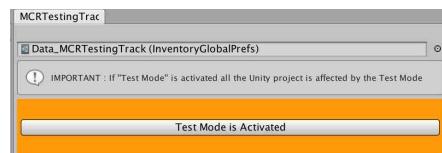
Left road (spot 1)

or

Right road (spot 2).



### 2- Activate **Test Mode**



### 3- Press **play** button.

You should see the car AI choose between left road and right road.



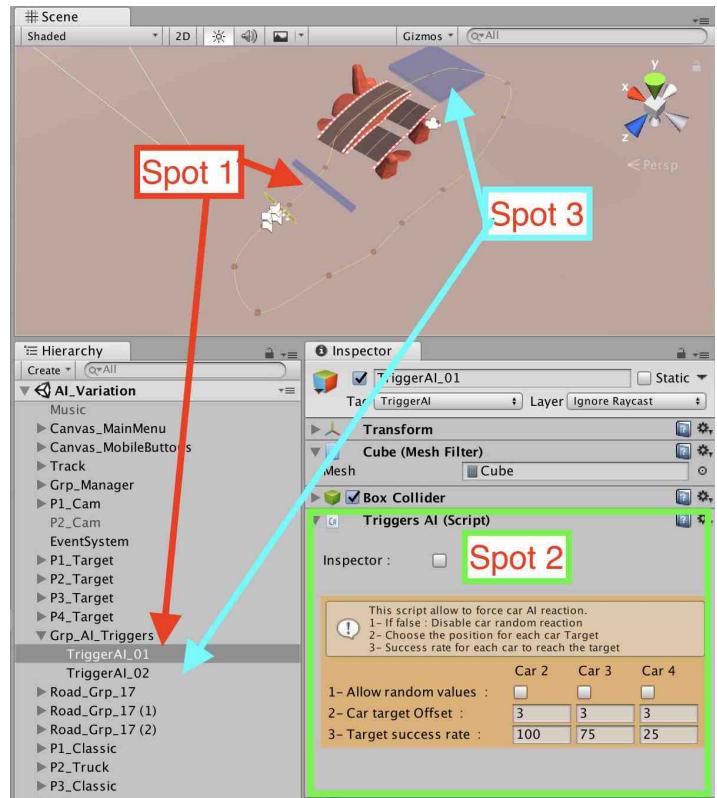
## How it works :

**Part 1 :** When a Car AI enter in the **trigger\_AI\_01** (spot 1) the car take a decision using the value setup on script **TriggerAI** (spot 2)

In this case : Car AI choose between left road and right road

**Part 2 :** When a Car AI enter in the **trigger\_AI\_02** (spot 3) the car take a decision using the value setup on script **TriggerAI**

In this case : Car AI go back to his initial position to follow the track path



## How to setup a trigger :

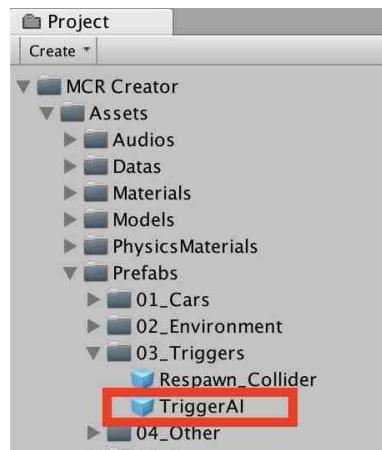
You find default prefab trigger on Project tab named :

**TriggerAI**

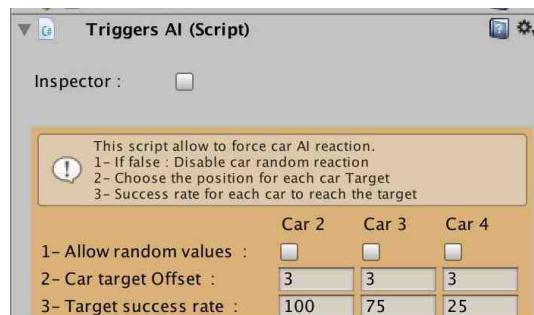
Project Tab : MCR Creator → Assets → Prefab → 03\_Triggers → TriggerAI

1- Drag and drop the prefab on your scene to use it.

2- Move the trigger where you want on scene to use it



**Info :** It is possible to setup AI reaction separately for car 2 car 3 and car 4



## 4.2.2 TriggersAI script parameters :

### 1-Allow random values :

**False** : random car AI reaction are deactivated

**True** : random car AI reaction are activated



#### Info :

Random car AI reaction are set when the car hit object over a certain force. It is manage on CarAI.cs.

So it is useful to deactivate random reaction when you want your cars cross a small bridge for example.

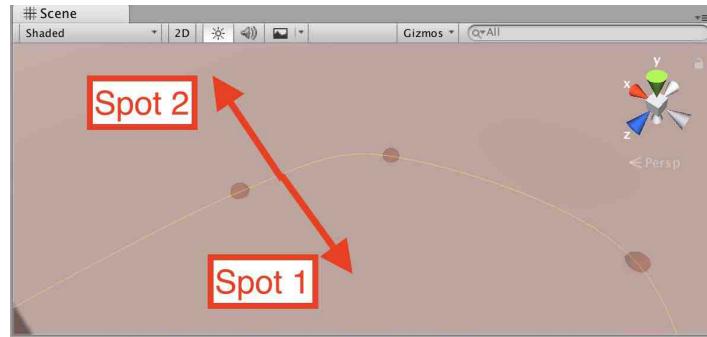
When the bridge is ended you could reactivate the Random car AI reaction using a Trigger\_AI prefab

## 2- Car Target Offset



If **positive** value : car is shifting on the right of the path (spot 1)

If **Negative** value : car is shifting on the left of the path



## 3-Target success rate :

Success rate to reach the car target offset

0 = car never goes to this target offset position

100 = car always goes to his target offset position

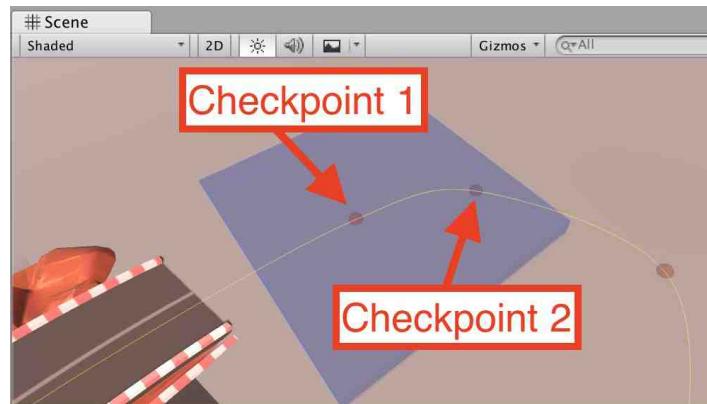


## IMPORTANT : Tips :

If you create a trigger that force the car to come back to his initial position on track path :

**Scale your trigger to cover at least two checkpoints (see picture)**

It will avoid some respawn bug.

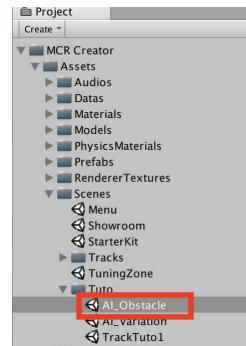


### 4.3- AI Obstacle

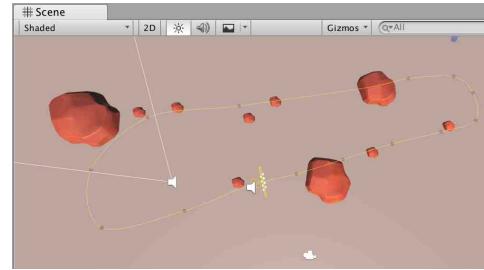
In this section we are going to show how to setup a gameObject to be avoided by a car with AI.

#### 1- Open scene AI\_Obstacle on Project tab

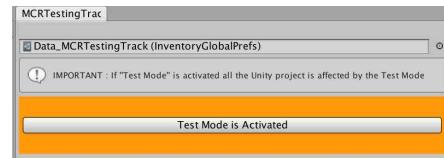
Project tab : MCR Creator → Assets → Scenes → Tuto → AI\_Obstacle



This example show how car AI could avoid an obstacle.



#### 2- Activate Test Mode



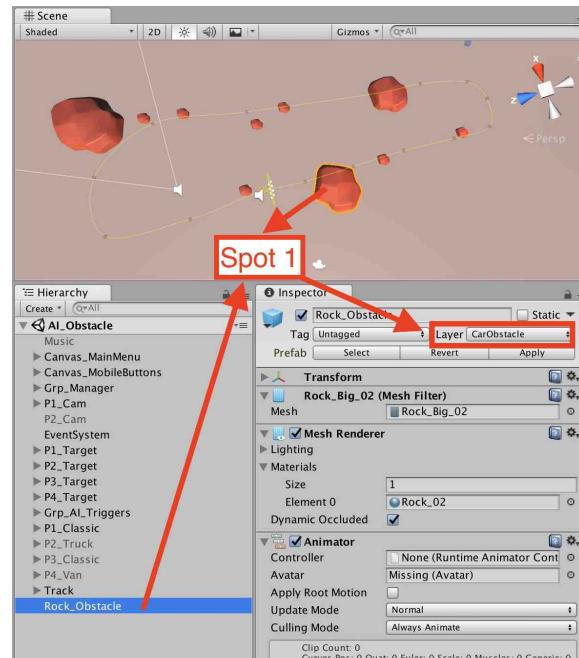
#### 3- Press play button.

You could see that car AI avoid rocks



#### How to setup a gameObject to be avoided by car AI :

The gameObject need to be on Layer CarObstacle



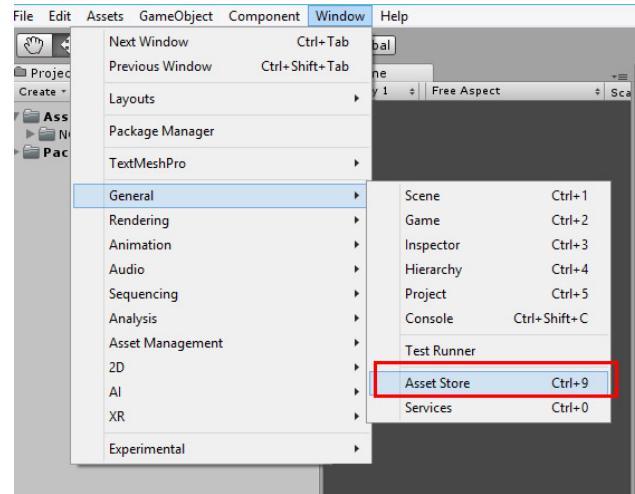
#### Notes :

If the gameObject is too small cars could have difficulties to avoid the obstacle

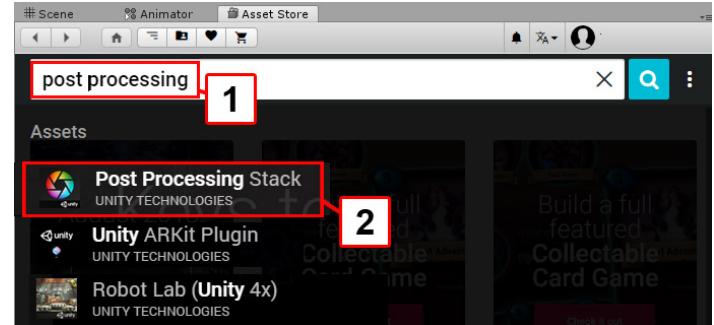
## 5-Effects

You need to download a free asset on asset store

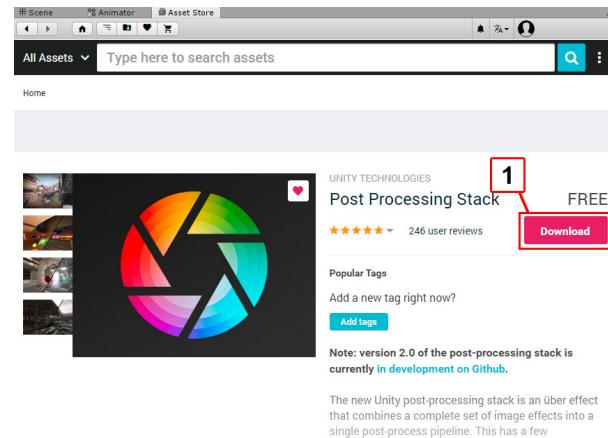
1 Go to Window → General → Asset Store



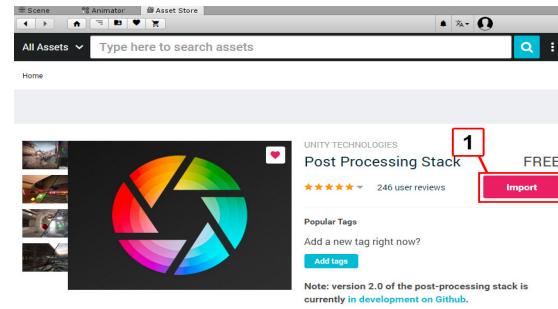
2 You need to log in



3 Search Post Processing Stack (spot 1)



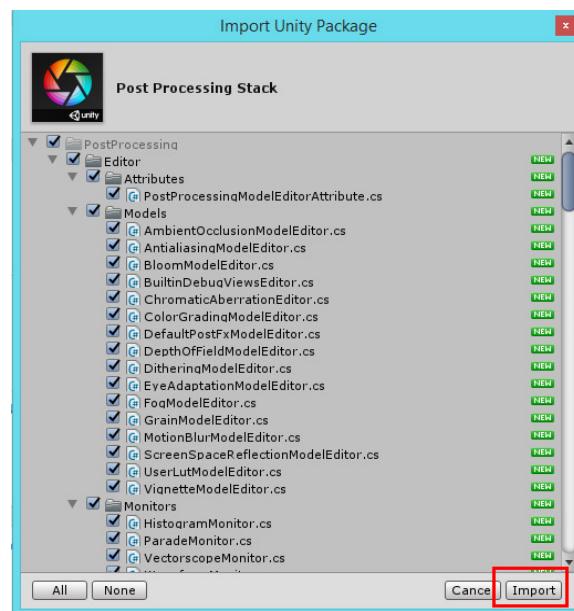
4 Press on Post Processing Stack icon (spot2)



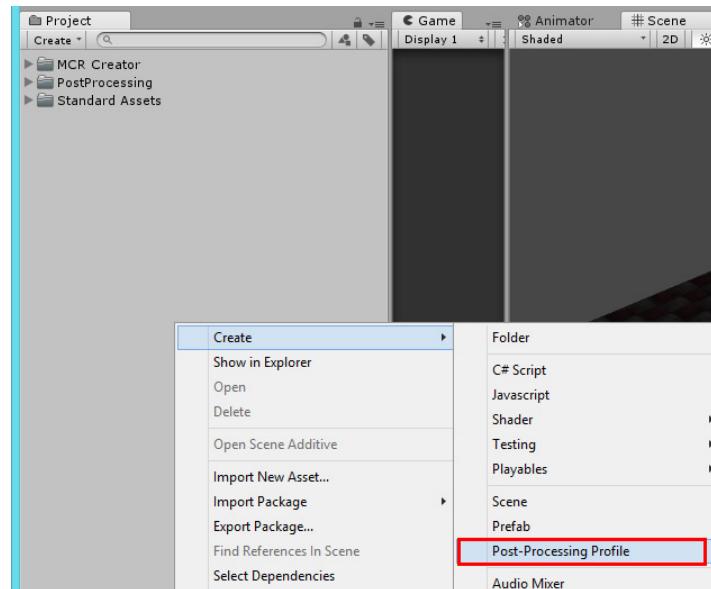
5 Press button Download (spot 1)

6 Press button Import (spot 1)

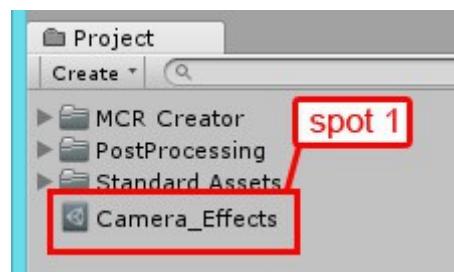
7 Press button **Import**



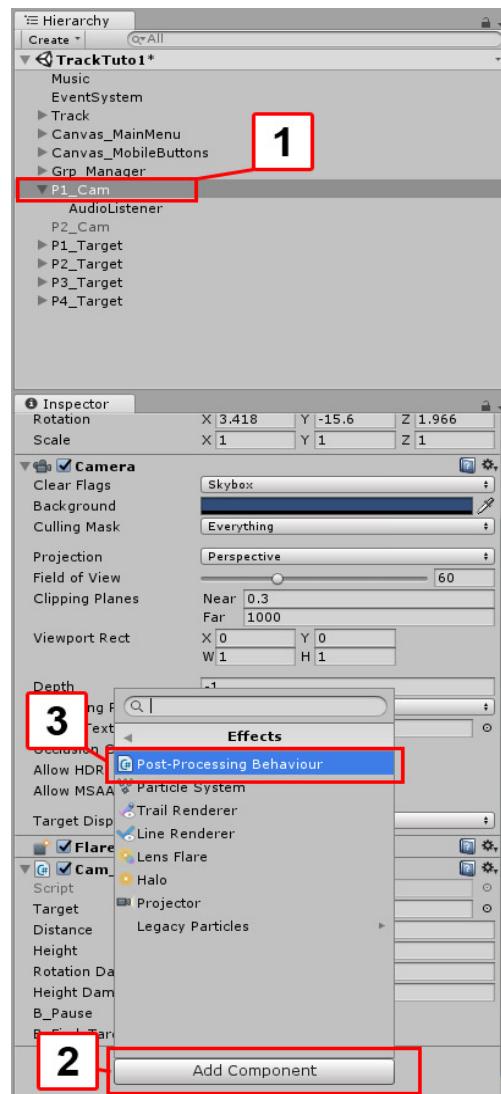
8 Mouse right click in project tab  
Then select **Create → Post-Processing Profile**



9 Rename it (for example **Camera\_Effects**) (spot1)



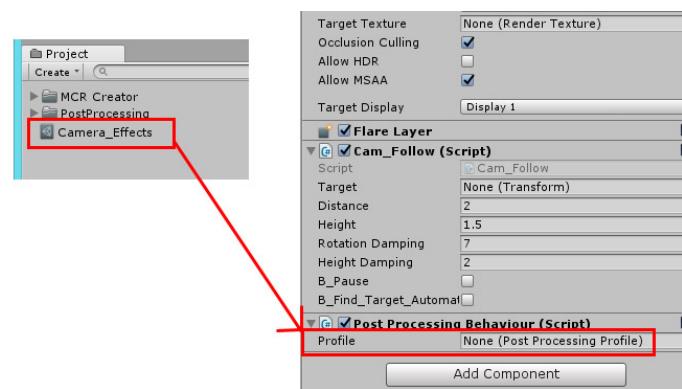
**10** In hierarchy tab select **P1\_Cam** (spot 1)



**11** Press button **Add Component** (spot 2)

**12** Select Effects → Post-Processing Behaviour (spot 3)

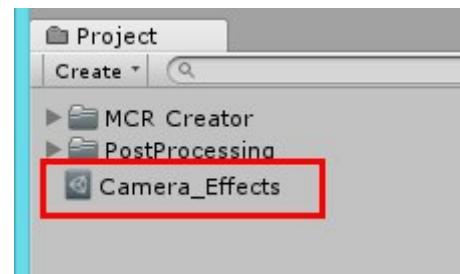
**13** Drag and drop **Camera\_Effects** in **Profile slot**



**14** In hierarchy tab select **P2\_Cam**

Do again the steps **11 to 13**

15 In Project tab select **Camera\_Effects**

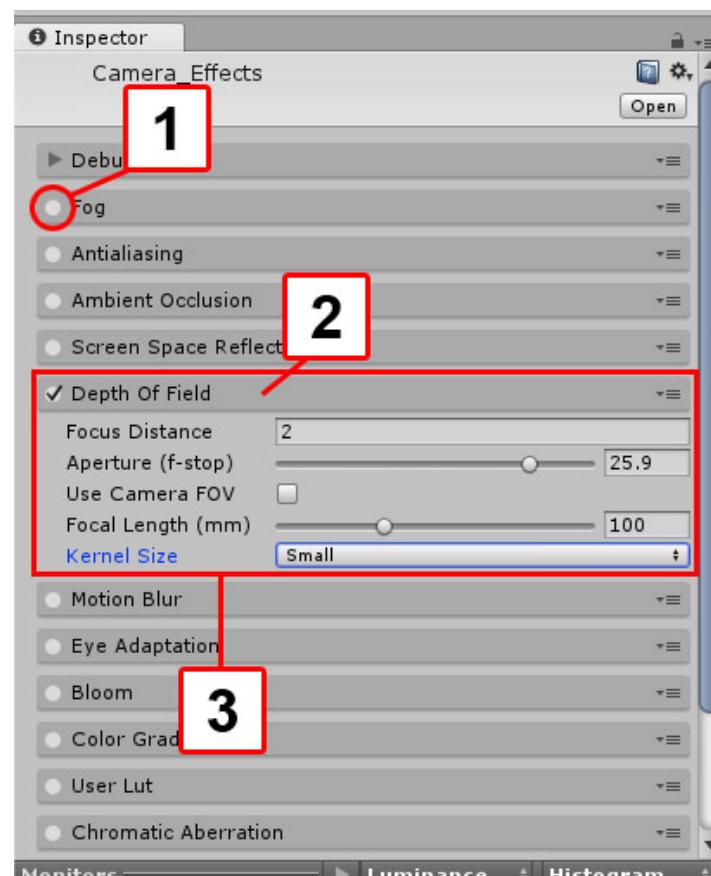


16 In Inspector tab :

- Uncheck Fog (spot 1)
- Check **Depth Of Field** Box (spot 2)

*Click on grey bar to open Depth Of Field tab*

17 Use the values shown in the image below  
(spot 3)



## 6-Export : Lighting and Optimization

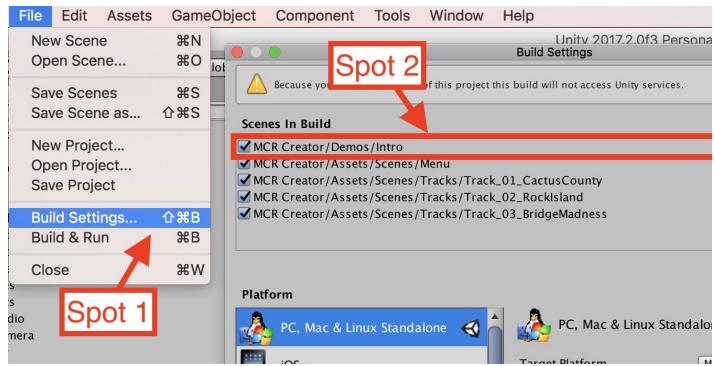
### 6.0 Intro Scene

**IMPORTANT :** When you export your build you need to keep the **Intro** in the **Scenes in Build** section.

1- Open **File → Build settings** (spot1).

You need to have the **Intro** on the top of the list (spot 2).

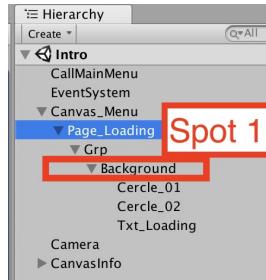
*Intro* scene allow to initialize the **Menu** scene when the game is launched.



**Info 1 :** You could use this scene to add your Logo.

Change **Background** (spot 1)

Hierarchy tab : **Canvas\_Menu → Page\_Loading → Grp → Background**



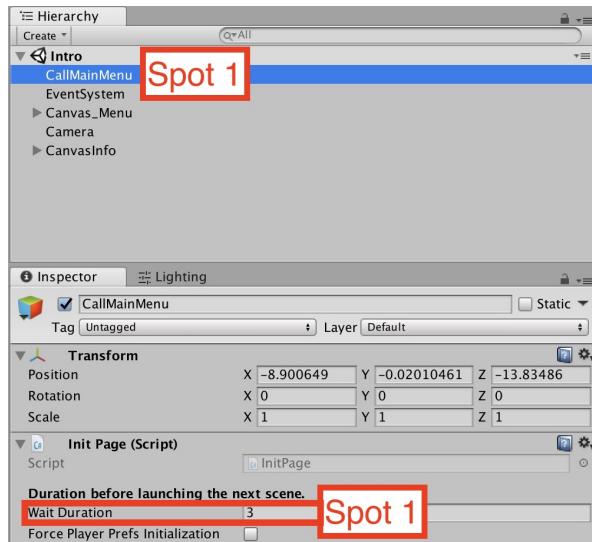
**Info 2 :** It is possible to change the duration of the screen.

1- Select **CallMainMenu** on the Hierarchy (spot 1)

Hierarchy tab : **CallMainMenu**

2- Change value **Wait Duration** on the Inspector (spot 2).

*It is possible to use 0 if you want.*



## 6.1 Calculate Lightmaps

Calculate lightmap is the very useful to optimize game.

For the mobile it is essential to calculate the lightmaps to conserve steady FPS .

For the desktop, it is not obligatory but it is advised because it improves the visual result (and optimize FPS too).

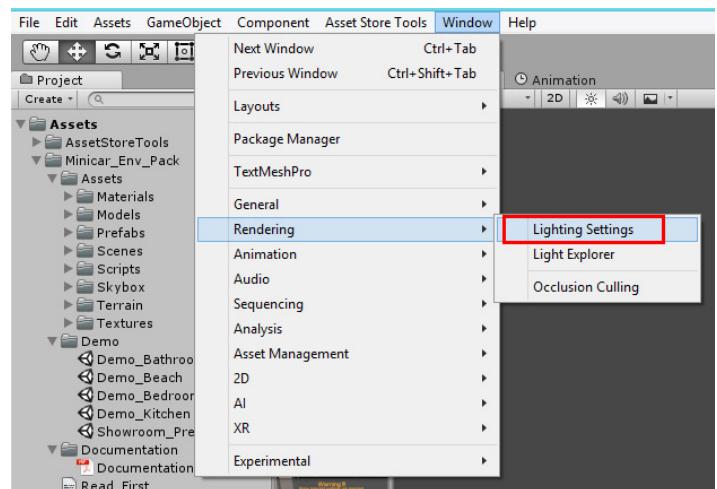
Follow this instructions to learn how to calculate Lightmaps.

### Important :

You need to calculate lightmaps for **menu** scene and for each track scene included in your build.

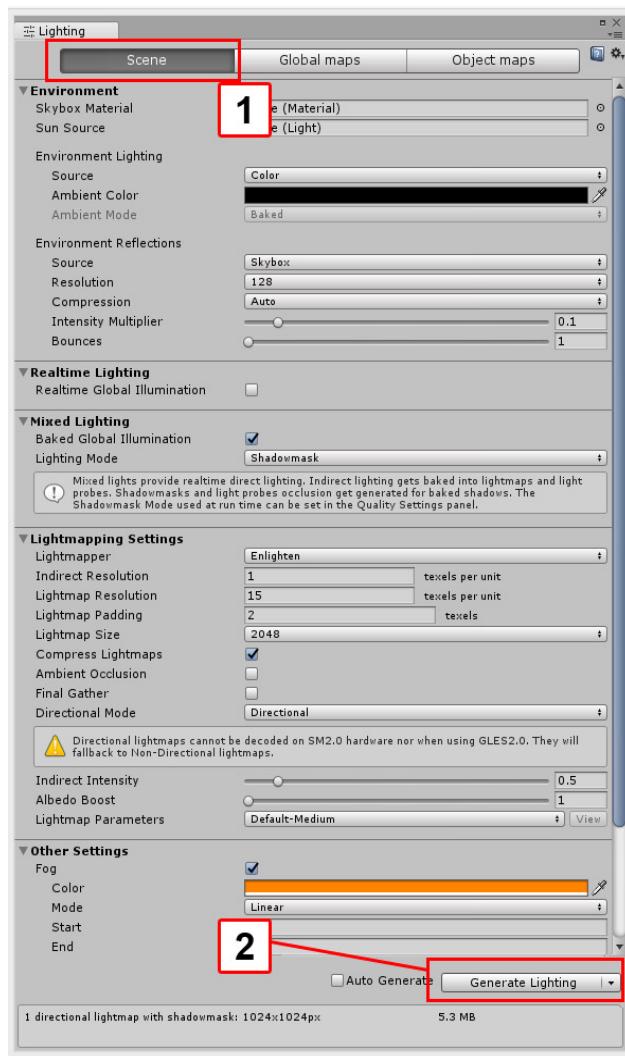
**16 Open lighting panel.**

**Window → Rendering → Lighting settings**



**17** Select **Scene tab** in lighting panel  
(spot 1)

**18** Check box **Generate Lighting** at the bottom of lighting tab (spot 2)

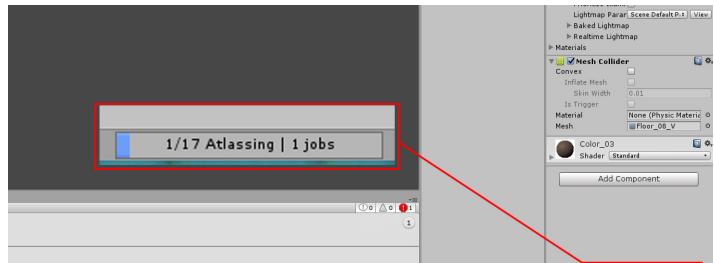


Precompute lightmap process is starting.  
When the precompute process is running,  
a blue progress bar will appear in the  
bottom right of the Editor.

Tips :

*Calculing lightmaps on a large scene can take time.*

*A first it is better to test lightmaps on small part.*



When precomputed process is finished  
**run your scene.**



You can see that **cars are not lit by the light**.

It is because light in scene is baked light.  
Baked light only lit static object .

Cars are not a static object.

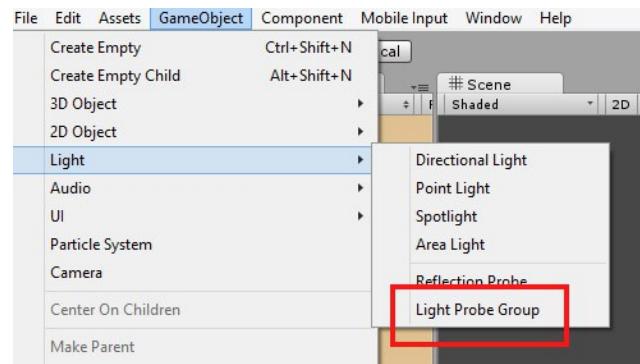
To add light to cars you need to create **Lightprobe**.

## 6.2 Light Probes

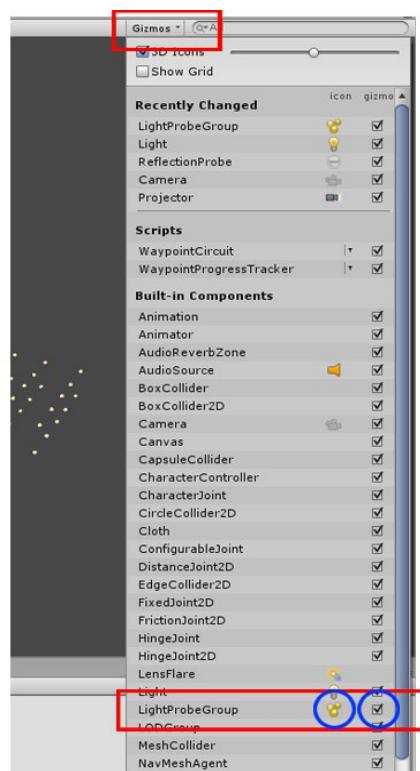
1 Open scene **LightProbTuto1**

MCR Creator → Assets → Scenes → Tuto → **LightProbTuto1**

1 Go to **GameObject** → **Light** → **Light Prob Group**.



If the light prob doesn't appear check that the lightprobGroup option is selected in Gizmos window.



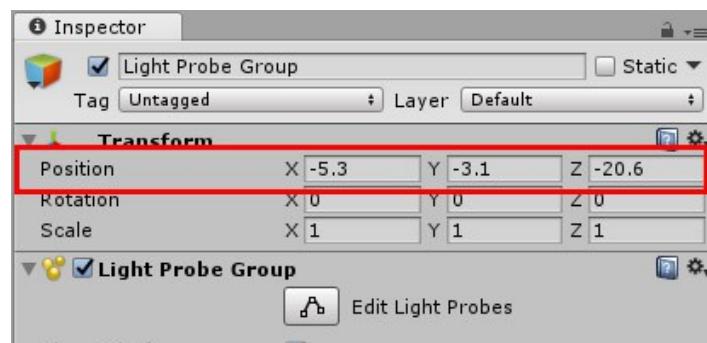
**2 Select Light Probe Group in hierarchy.**

In Inspector change the X,Y, and Z coordinates :

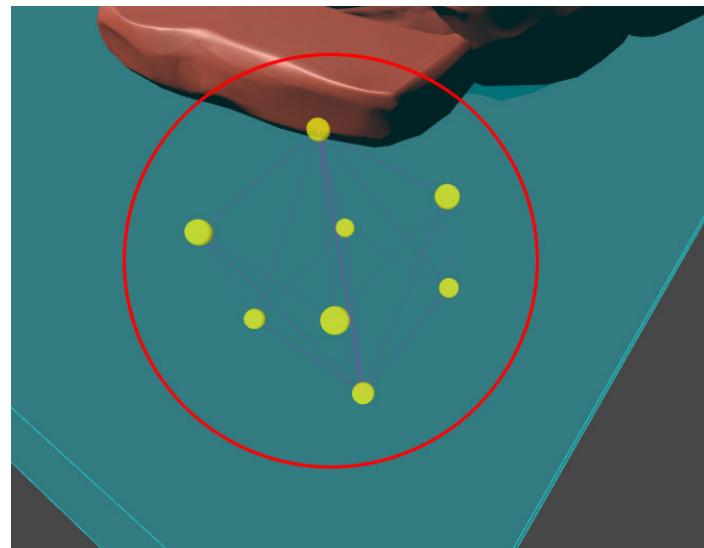
X: -5.3

Y: -3.1

Z: -20.6



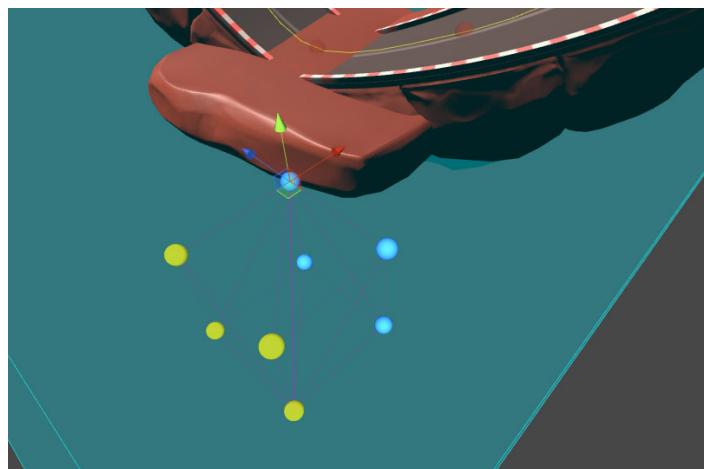
Light prob is in the form of a cube formed by 8 yellow balls.



**3 Select Light Probe Group in hierarchy tab.**

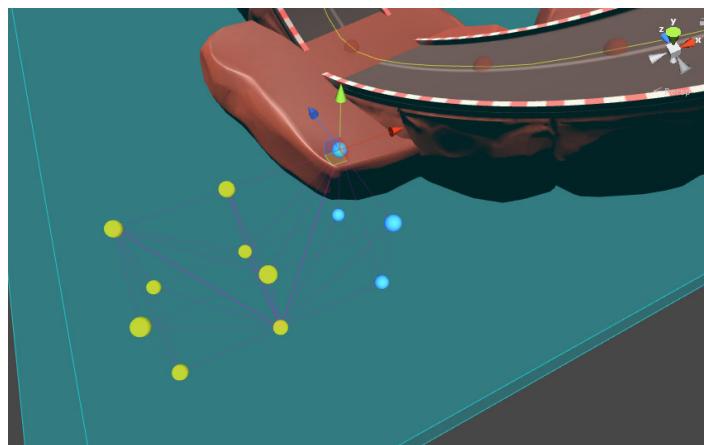
**4 In Scene tab select 4 balls (yellow balls become blue).**

*Tips: To select several balls use the **MJ** keys.*



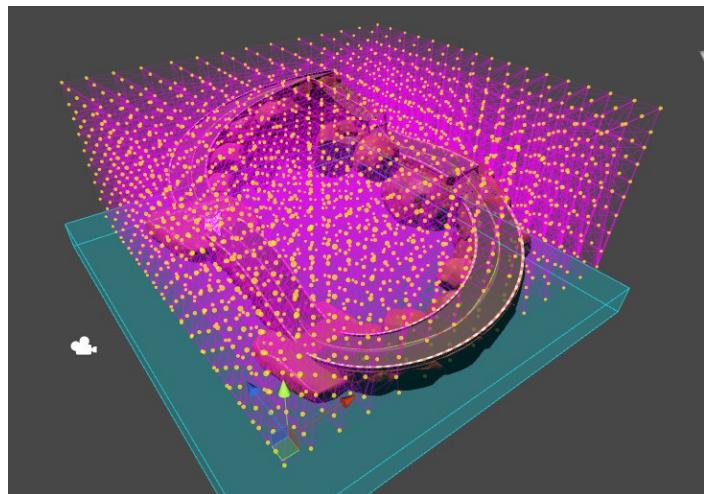
**5** Duplicate object by pressing **CTRL + D**

**6** Move the blue balls on the X-axis for creating a new cube.



**7** Repeat the process until the entire area covered by the cars is filled.

*Each cube (represented by 8 blue balls) corresponds to a specific lighting area. The smaller the cubes the more precise the light.*



**8** Open **Lighting** Tab

**Window → Rendering → Lighting settings**



Calculate the lighmaps by pressing « **generate lighting** » in lighting tab

**9** Run the scene

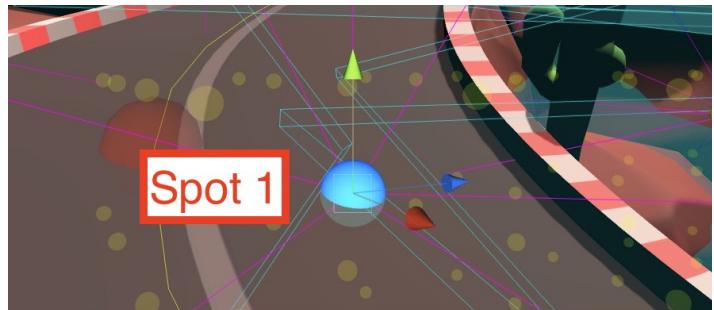


Now you can see that the cars are lit by the light.

## INFO :

If your car become black in the circuit you need to modify the position of the light Probes balls in this zone.

- 1- Check if their is a ball inside a wall or floor (spot 1).



In this case move the ball outside this object (spot 2)

- 2- Check if the ball are not to far from the road.



## 6.3 Combiner Mesh

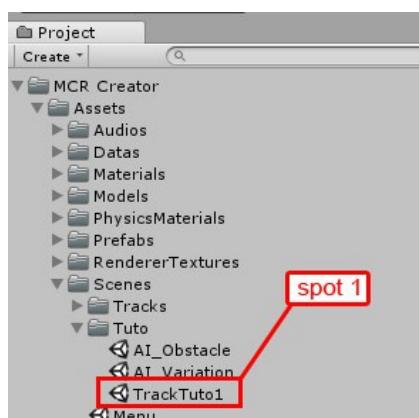
A combiner mesh script is included in this asset.

**MCR Creator → Assets → Scripts → MeshCombinervtwo**

Combiner mesh script combine all the mesh that have the same material on a single new mesh. This a good solution to **drastically reduce drawcalls and reduce lighmap precomputed time**.

### 1 Open scene **TrackTuto1**

**MCR Creator → Assets → Scenes → Tuto → TrackTuto1**

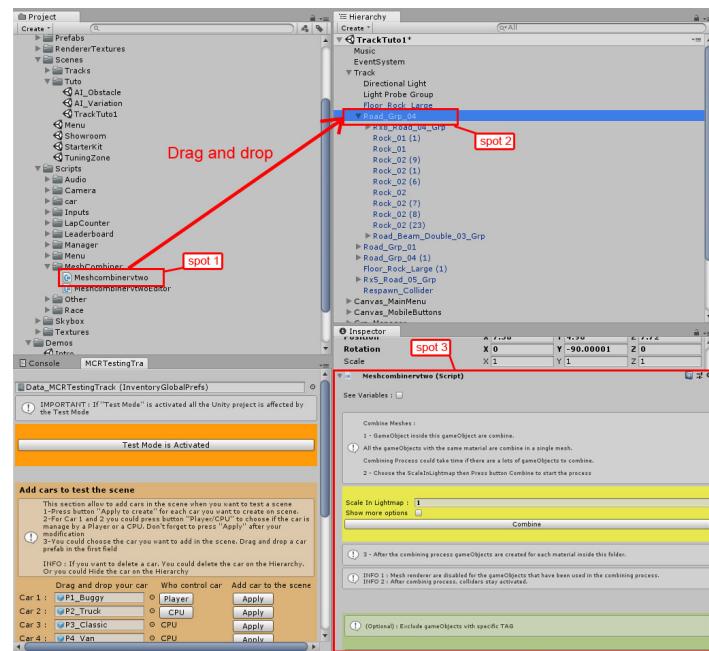


**2** From project tab drag and drop **Meshcombinervtwo** (spot 1) on **Road\_Grp\_04** in hierarchy tab (spot 2)

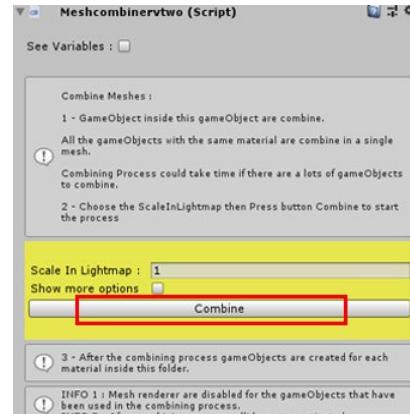
**Track → Road\_Grp\_04**

**Meshcombinerscript** is added to **Road\_Grp\_04** (spot 3)

**3 Select Road\_Grp\_04 on the Hierarchy**



**4 Click on Combine Button**

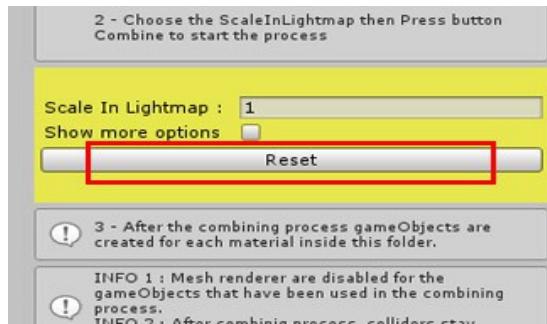


After the process new **Combine** gameObjects are created inside **Road\_Grp\_04** group. (spot 1)

All other objects in the group are hide.



If you want to reverse the process press **Reset** button or **CTRL+Z**



**Tips :** If you have a lot of objects (or large objects) in group we recommande to separate into several pieces to avoid poor quality lightmaps.

- If you have strange results, this is probably because the number of tris of combine objects are too important.  
To solve this issue separate into several groups and combine each group separately.

### Options:

Some objects, especially those with rounded edges require more lightmap definition.

To increase the definition of these objects increase **Scale in lightmap value**.



### Exemple :

- Create 2 groups
- Add combiner script on each
- Add to the first group objects with sharp edges
- Set **Scale in lightmap value** to 1
- Add to the second group objects with smooth edges ( for example cactus)
- Set **Scale in lightmap value** to 4

**Caution:** If you change the value you must decombine (reset) and then recombine the group (combine)

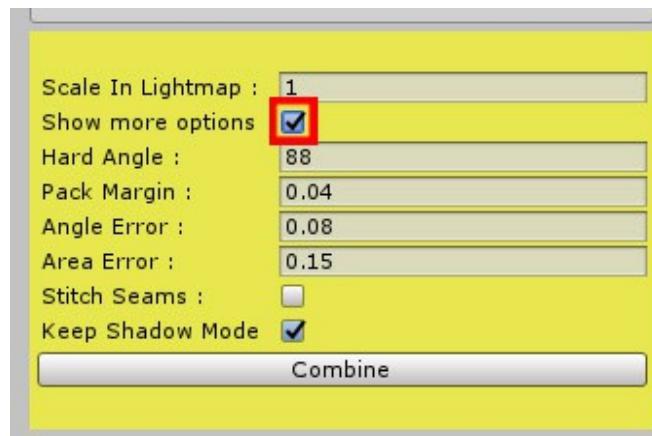
**Tips:** if you want to increase the quality of lightmaps for the whole scene, you can

increase **lightmap resolution** value in **lightings settings** tab.  
On the other hand the size of the lightmaps will be larger and the lightmaps precomputing time too.  
So it's best to put a low value of **lightmap resolution** in **lightings settings** and choose a **scale in lightmap** value depending on the type of objects(smooth or sharp).

To see more options check **Show more options** box

**Stitch seams** improves the quality of lightmaps

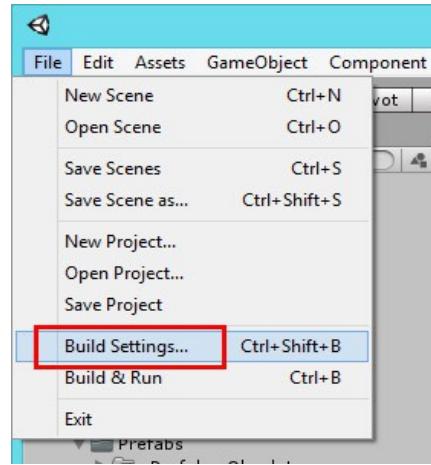
**Keep shadow Mode** allows you to keep the shadows options (for example cast shadow: off)



## 7-Export to mobile

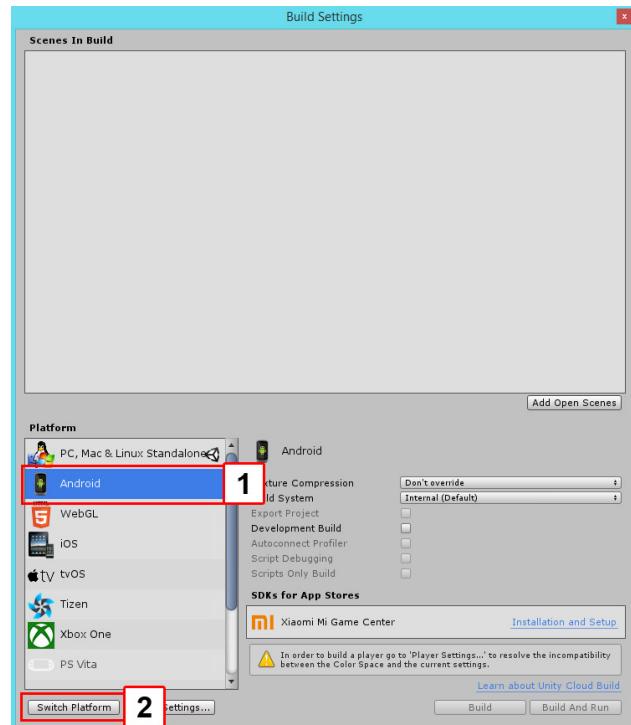
Follow this step to export your project to mobile (example for Android)

1 Go to **File** → **Build\_Settings**.

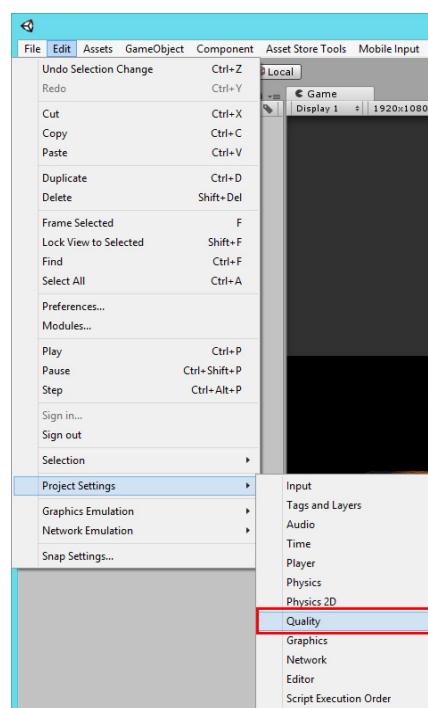


1 Select **Android** (spot 1)

2 Press button **Switch Platform** (spot 2)



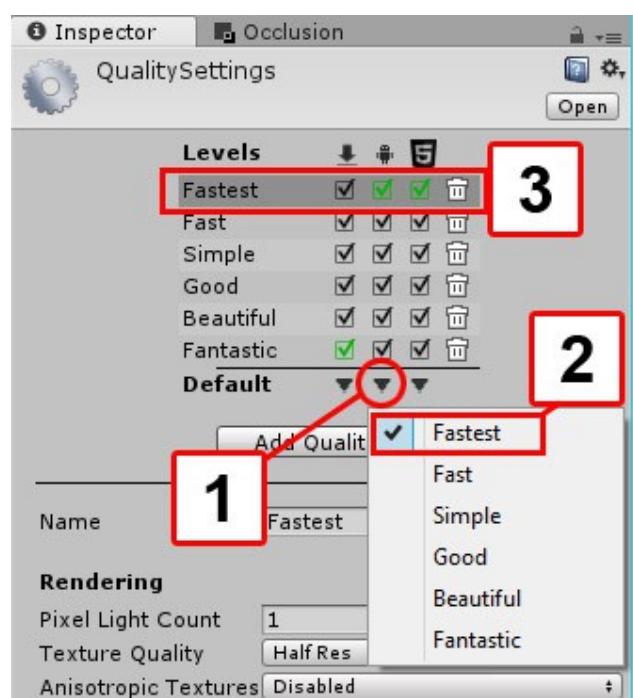
3 Go to **Edit** → **Project Settings** → **Quality**



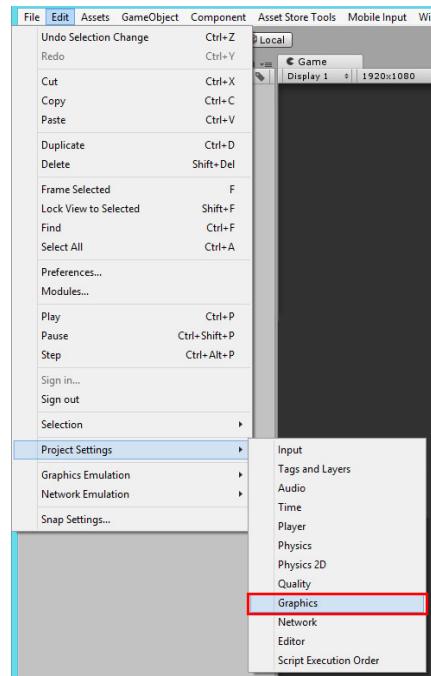
4 Press the triangle (spot 1)

5 Select **Fastest** to choose fastest when build  
(spot 2)

6 Press **Fastest** to choose fastest visualization in unity viewport (spot 3)



7 Go to **Edit** → **Project\_Settings** → **Graphics**

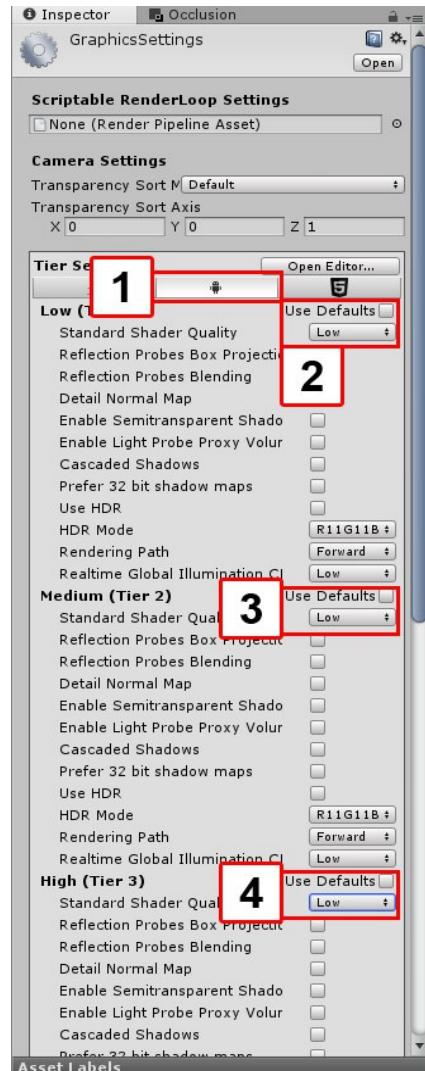


8 Choose Android (press android small icon)  
(spot 1)

9 Uncheck **Use Default** checkbox  
Then choose **Low** (spot 2)

10 Uncheck **Use Default** checkbox  
Then choose **Low** (spot 3)

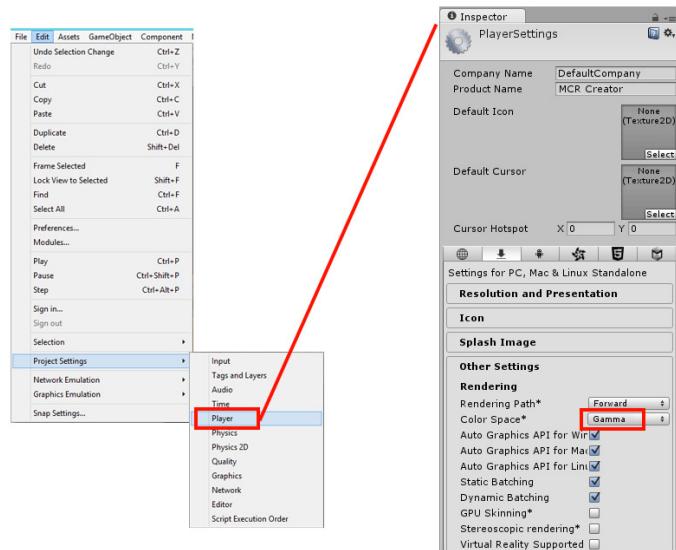
11 Uncheck **Use Default** checkbox  
Then choose **Low** (spot 4)



## 12 Open Edit → Project Settings →

### Player

In Inspector window change Color Space to Gamma



## 13 Now we want to use optimize materials for mobile

- First Quit Unity (close software)

On your Pc/ Mac Desktop :

- Open folder yourProject / MCR Creator / Assets / \_Materials / Material\_Mobile

- Select all files in folder

- Copy

- Open folder yourProject / MCR Creator / Assets / \_Materials / Material\_Grp

- Paste

- Restart Unity and open you project

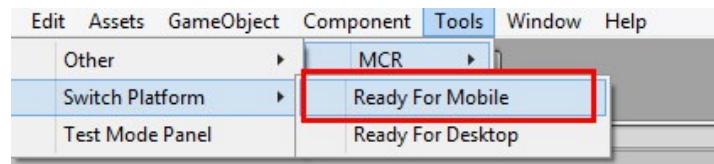
### Tips :

If you want to reverse the process copy materials from yourProject / MCR Creator / Assets / \_Materials / Material/Desktop

Paste in yourProject / MCR Creator / Assets / \_Materials / Material\_Grp

#### 14 A Open scene Menu

MCR Creator → Assets → Scenes → Menu



#### B Go to Tools → MCR → Switch Platform → Ready For Mobile

It allow to automatically :

- Setup UI for Mobile (display needed Mobiles buttons) (more info [here](#))

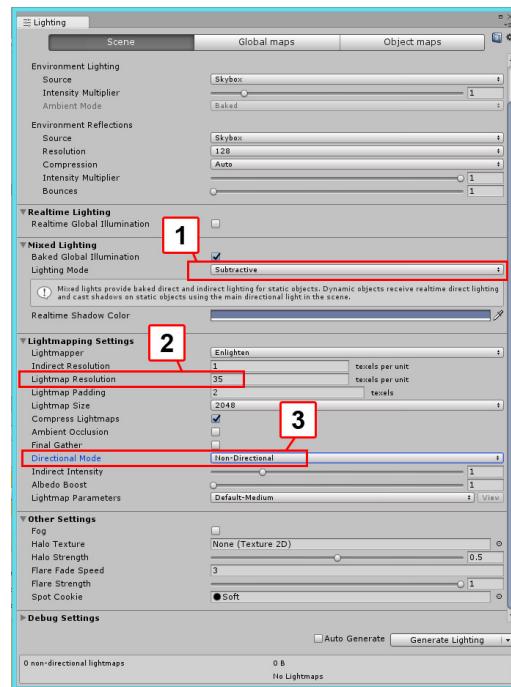
#### C Open Lighting Tab

Window → Rendering → Lighting settings

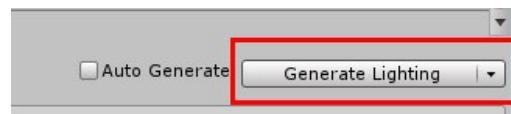
Set **Lighting Mode** to **Subtractive** (spot 1)

Set **lightmap resolution** to **35** (spot 2)

Set **Directional Mode** to **Non Directional** (spot 3)



#### D Calculate the lighmaps by pressing **generate lighting** in lighting tab



#### E Save your scene

#### Important :

You need to do steps 15 to 24 for each track scene.

For example for the complete demo project you need to do steps 15 to 24 for this three scenes :

Track\_01\_CactusCounty  
Track\_02\_RockIsland  
Track\_03\_BridgeMadness

MCR Creator / Assets / Scenes / Tracks

#### 15 If you use Effects on camera delete

## Post-Processing Behaviour script

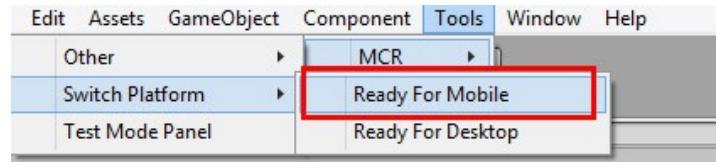
More informations about Effects [here](#)

**16** Open your track scene

**17** Go to Tools → MCR → Switch Platform → Ready For Mobile

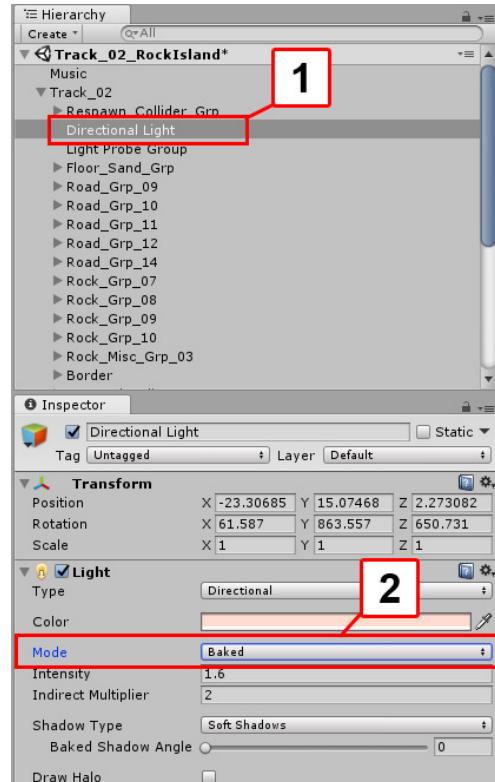
It allow to automatically :

- Setup UI for Mobile (display needed Mobiles buttons and Mobile Input Interface) (more [here](#))
- Setup default car settings for Mobile (These car options could be find on Hierarchy tab : Grp\_Manager)



**18** In hierarchy tab select Directionnal\_Light (spot\_01)

Set Mode to Baked (spot\_02)



## 19 Open Lighting Tab

Window → Rendering → Lighting Settings

We only change some parameters assuming that you use StarterKit scene as the starting point

## 20 Set Lighting Mode to Subtractive (spot 1)

## 21 Set lighmap resolution to 35 (spot 2)

Tips :

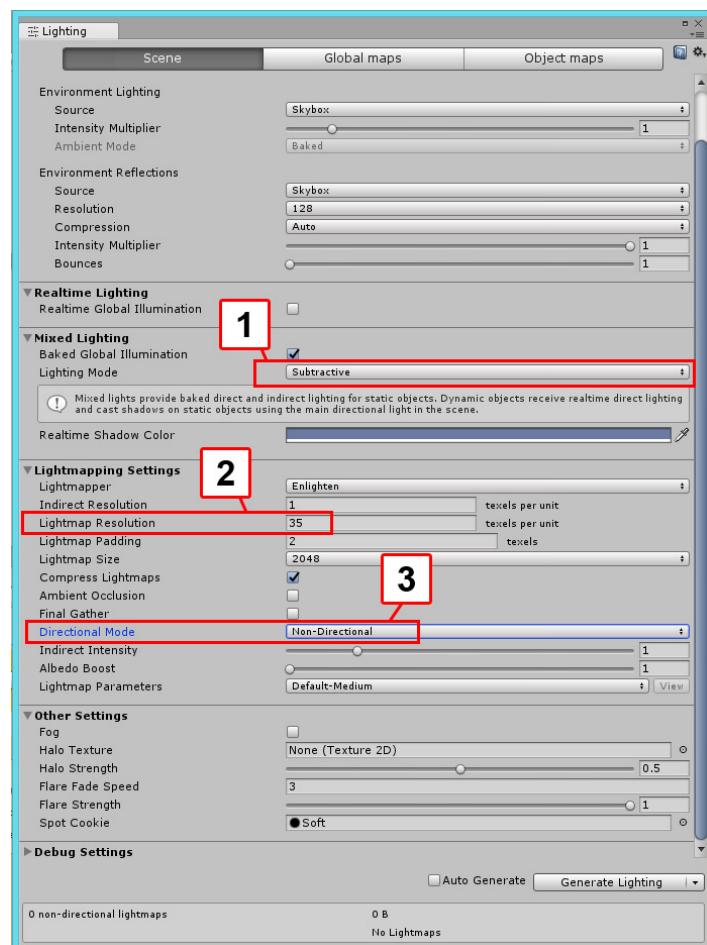
The higher the number, the higher the quality of the lighmaps.

In return the size of the lighmaps will be larger.

Lighmaps precomputed time will be longer too.

## 22 Set Directional Mode to Non Directional (spot 3)

## 23 Calculate the lighmaps by pressing generate lighting in lighting tab



## 24 Save your scene.

**Important :** If you have more than one track scene in your build restart at step 15

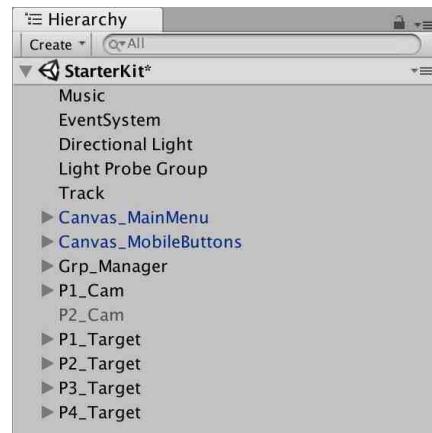
You project is ready to export to Mobile platform

## 8- Scene : Starter kit : Quick overview

This section give you a short description of gameObjects that could be find on StarterKit scene Hierarchy.

Project tab : MCR Creator → Assets → Scenes → StarterKit

**Important :** Do not rename gameObject on StarterKit scene hierarchy tab because some gameObjects are call by their name on some scripts



**Music :** Play the music. You could deactivate or delete it.

Music

**EventSystem :** Use for UI.

EventSystem

**Directional Light :**

Ready to use direction light for the scene

Directional Light  
Light Probe Group

**Light Probe Group :**

Ready to use light probe Group

**Track :**

A folder to put your track elements

Track

**Canvas\_mainMenu :** Use to display

Menu buttons.

▶ Canvas\_MainMenu

**Canvas\_MobileButtons :** Use to display mobile buttons.

▶ Canvas\_MobileButtons

**PauseManager** : Use to pause and unpause the game.

**Game\_Manager** :

- Manage the game rules.
- Countdown
- AI behavior

**Track\_Path** : Use to create AI Path and respawn points.

```
▼ Grp_Manager
  PauseManager
  Game_Manager
  Track_Path
  ▼ Grp_StartLine
    ▼ Grp
      StartLine_lapCounter
      Finishing_line
      Start_Position_01
      Start_Position_02
      Start_Position_03
      Start_Position_04
```

**StartLine\_LapCounter** : Manage lap counter.

**Start\_Position\_01 02 03 04** : Car are spawned on these positions when game starts.

**P1\_Cam and P2\_Cam** : Camera for Player 1 and Player 2 if needed.

```
► P1_Cam
  P2_Cam
```

Player 1,2,3 and 4 look at these targets if needed.

Use for AI path.

```
► P1_Target
  ► P2_Target
  ► P3_Target
  ► P4_Target
```

## 9- UI Menu

### 9.1 Menus : short description.

Project tab : MCR Creator → Assets → Scenes → Menu

All the menu page are on **Canvas\_MainMenu** on the hierarchy



**Page Hub :**



**Page Race Mode :**



**Page Quit Game :**



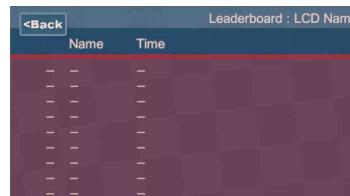
**Page Car Selection :**



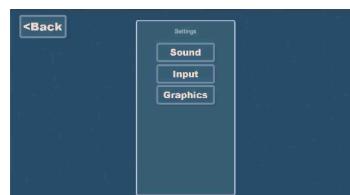
**Page Track Selection :**



**Page Leaderboard :**



**Page Settings :**





### Page Sound :



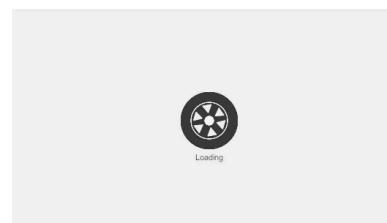
### Page Inputs :



### Page Graphics :



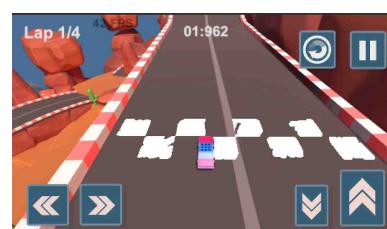
### Page Loading :



### Mobile Inputs :

Important : Mobile Input are on **Canvas\_MobileButtons** on the Hierarchy.

You find **Canvas\_MobileButtons** on *StarterKit* scene or any race track scene  
Project tab : MCR Creator → Assets → Scenes → *StarterKit*



### IMPORTANT :

**Some page need to be managed on **Menu Scene****

Project tab : MCR Creator → Assets → Scenes → **Menu**

**and other on race track scene or **StarterKit** scene**

Project tab : MCR Creator → Assets → Scenes → **StarterKit**

**List of pages for Menu Scene :**

Page Hub  
Page Race Mode  
Page Quit Game  
Page Car Selection  
Page Track Selection  
Page Leaderboard  
Page Setting  
Page Sound  
Page Inputs  
Page Graphics  
Page Loading

**List of pages for race track :**

(**StartKit** is default race track scene)

Page Quit Game  
Page Pause  
Page Sound  
Page Inputs  
Page Graphics  
Page Loading  
*Mobile Inputs*

## 9.2 How to save race track UI modifications for all the circuits

**Example with StarterKit scene :**

Project tab : MCR Creator → Assets → Scenes → StarterKit

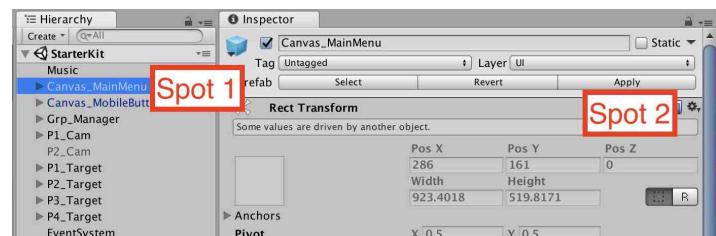
**1- Open the scene StarterKit.**

Project tab : MCR Creator → Assets → Scenes → StarterKit

**2- Select Canvas\_MainMenu on the Hierarchy (spot 1)**

**3- Press button Apply on the Inspector to save the modification.**

*Canvas\_MainMenu is a prefab so the modification will be apply in every scene using this prefab.*



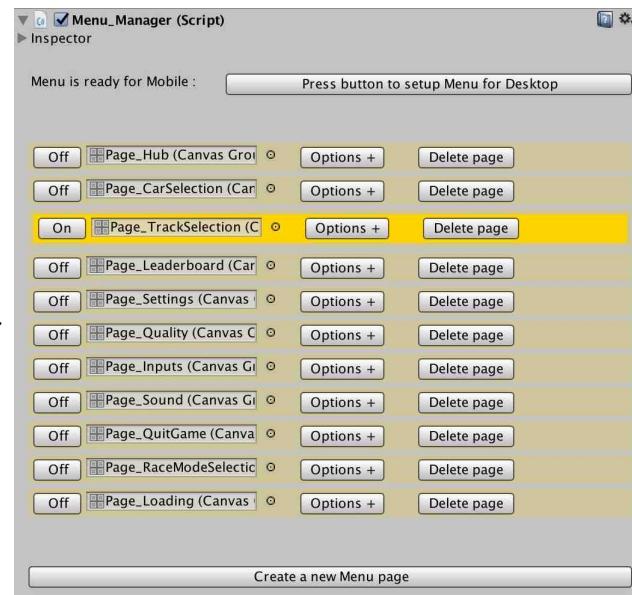
## 9.3 Menu\_Manager Overview

Menu Manager allow to easily manage Menus.

It is possible :

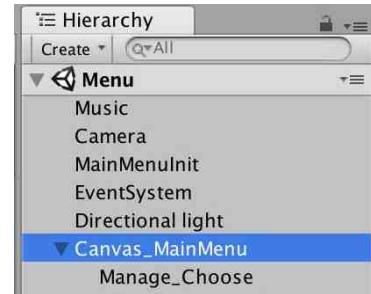
- To create new menu page.
- Setup a mobile version and a desktop version for the Menu.
- To switch from one menu version to other version with one button

To access Menu\_Manager select **Canvas\_MainMenu** on the Hierarchy tab  
Hierarchy tab : *Canvas\_MainMenu*



## 9.4 Create a new Menu page

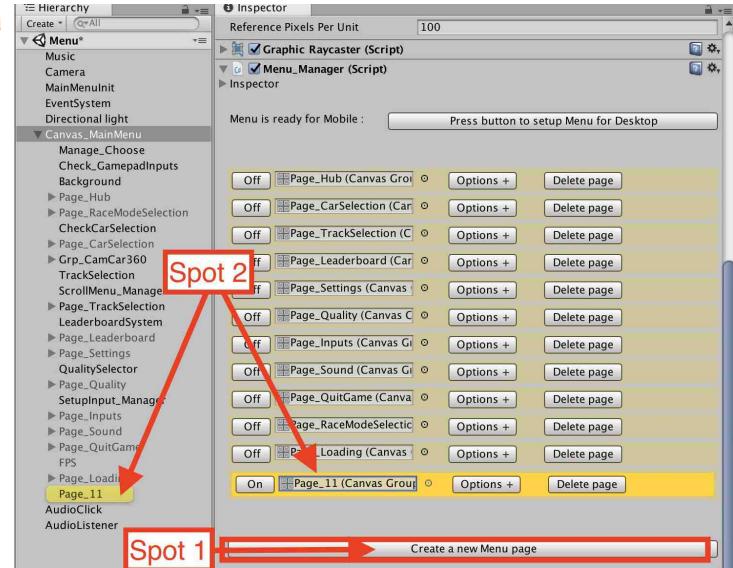
1- Select **Canvas\_MainMenu** on the Hierarchy



2- On the Inspector press button "Create a new page" (spot 1)

A new page is created (spot 2)

Now you could add buttons, images in this page.



## 9.5 How to switch between two pages when player press a UI button

Example with Button **Quit** on Page Hub :  
We are going to switch between **Page\_Hub** to **Page\_QuitGame**

### Step 1 : How to Change Page

1- Select **Quit** button on the Hierarchy.

Hierarchy Tab : **Canvas\_MainMenu** → **Page\_Hub** → **Quit**

Inside the **OnCLick()** section (spot 1) :

2- Drag and drop **Canvas\_MainMenu** inside the first slot (spot 2).

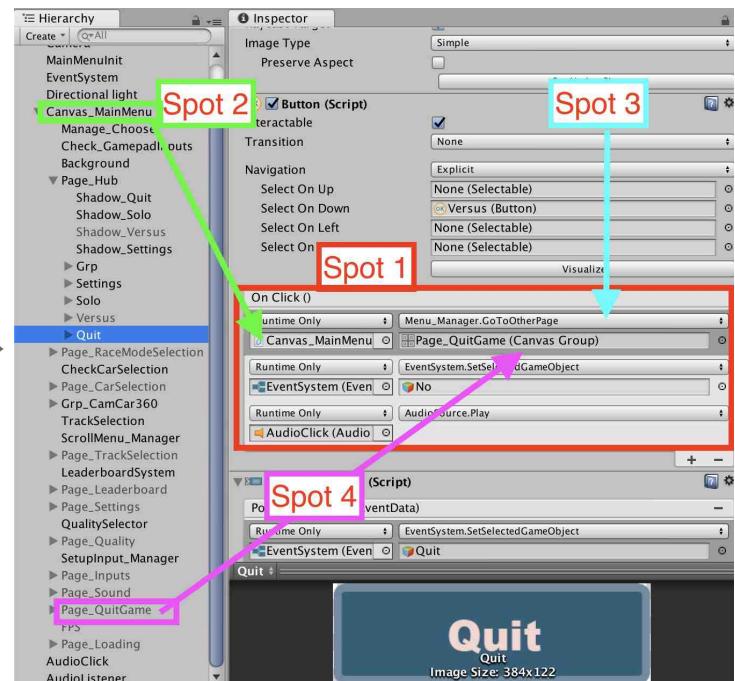
Note :

1- **Canvas\_MainMenu** contains a function that allow to close the current menu page and open an other menu page.

2- If **OnClick()** is empty click on "+" button on the bottom right corner to create a new slot

3- Select the function **Menu\_Manager** → **GoToOtherPage** (spot 3)

4- Drag and drop the page you want to open (spot 4)



### Step 2 : How to Select a new button when the new page is opened

Inside the **OnCLick()** section :

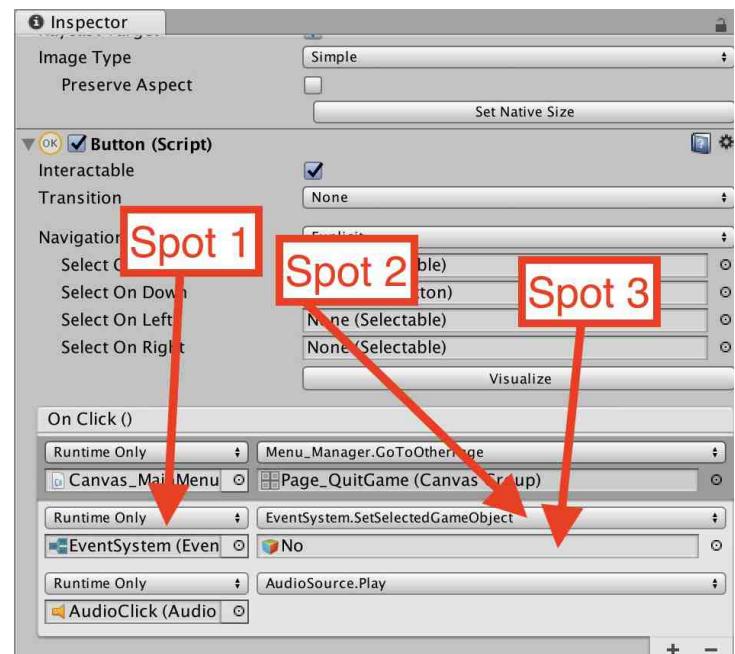
1- Drag and drop **EvenSystem** from Hierarchy tab inside the first slot (spot 1).  
Hierarchy tab : **EventSystem**

Note :

1- **Canvas\_MainMenu** contains a function that allow to select a UI button when the new page is opened  
2- If **OnClick()** is empty click on "+" button on the bottom right corner to create a new slot

2- Select the function **EventSystem** → **SetSelectedGameObject** (spot 2)

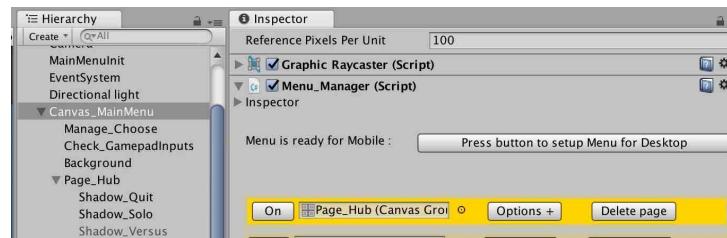
3- Drag and drop the button you want from the Hierarchy tab to be selected when the new page is activated (spot 3)



## 9.6 Setup Custom Menu page for Mobile or Desktop

1- Select **Canvas\_MainMenu** on the Hierarchy

Example with Page Hub :



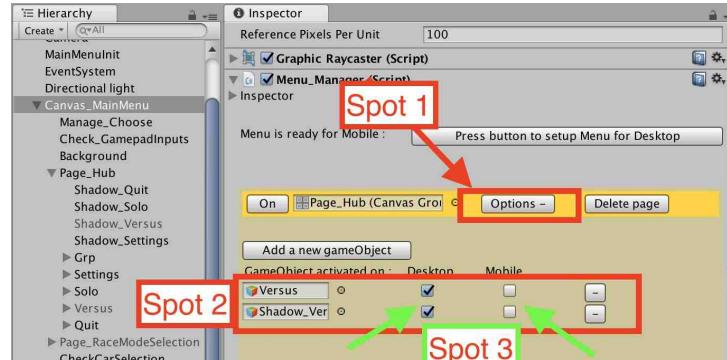
2- Press button **Option** (spot 1)

On spot 2 :

A gameObject could be activated or deactivated if game menu is setup for mobile or desktop.

On spot 3 :

Box are validate for Desktop and deactivate for mobile.



So gameObjects will be visible on Desktop Mode and not visible on Mobile mode

### IMPORTANT :

To see modification you need to Press button **Press button to setup Menu for ...** to switch between menu setup for Mobile and menu setup for desktop

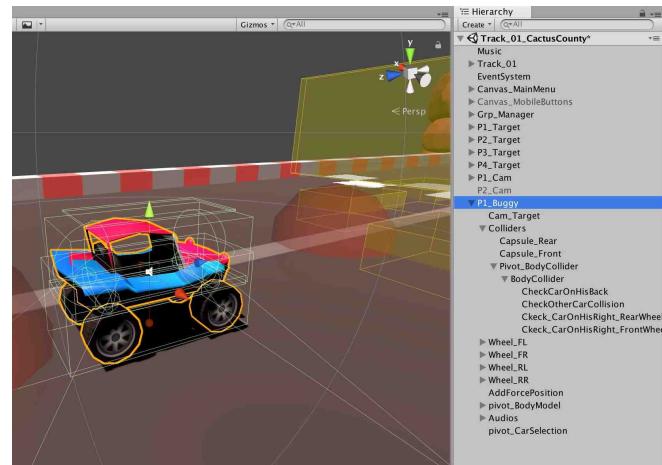
Menu is ready for Mobile :

It is possible to add new gameObject by pressing **Add a new gameObject** button

It is possible to remove a gameObject by pressing button -

## 10- Car Overview

This section show the different parts of the car.

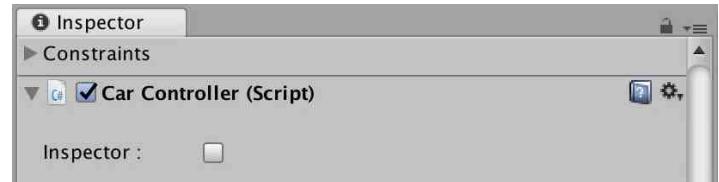


The car contains some scripts :



### Car Controller :

Manage the car behavior  
(more information on [Tuto 3](#))



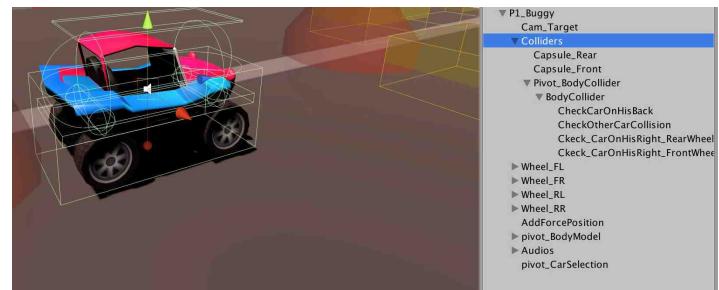
**CarPathFollow** : Manage car position on the track path.



**CarAI** : Manage car AI



### Colliders Group :



### Capsule\_Rear and Capsule\_Front :

These two colliders are used to avoid bug with wheels raycasts.



### **CheckCarOnHisBack :**

This trigger is used to know if the car is on his back.



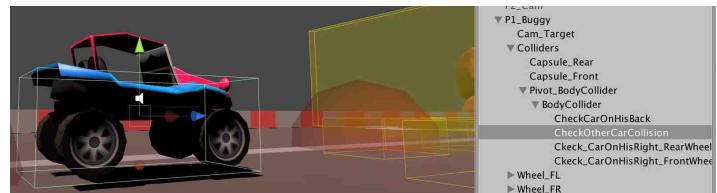
### **CheckOtherCarCollision :**

This collider create collision only with gameObject with the tag "CarColliderBox".

*It is only used on car.*

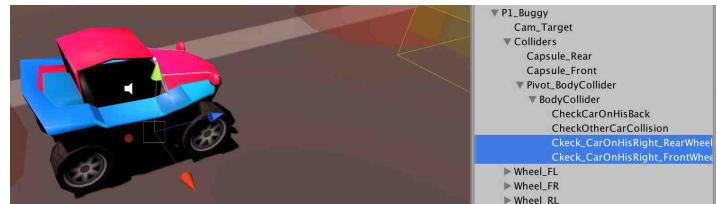
*It allow to create better collision between cars.*

*You have better collision result if you put the collider a little bit under the wheel(see picture).*



### **Ckeck\_CarOnHisRight\_RearWheel and Ckeck\_CarOnHisRight\_FrontWheel :**

Used to know if an other car is on the right of this car (Call by script CarAI.cs)

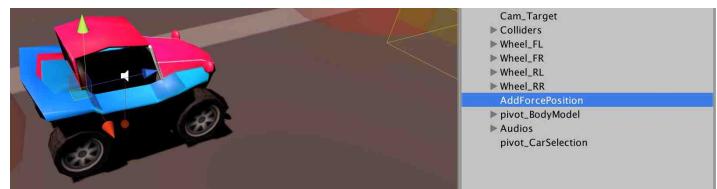


### **Groups that contains Wheels**



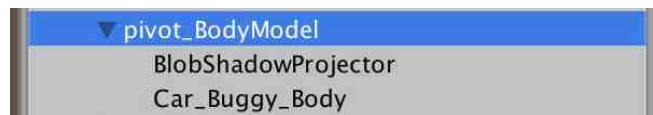
### **AddForcePosition :**

Force manage by carController is apply at this position.



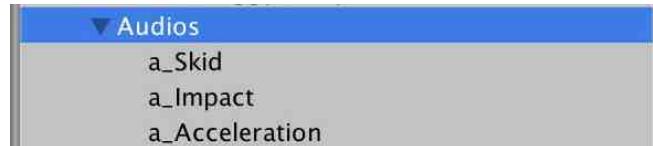
### **pivot\_BodyModel :**

This group contains the 3D models for the car body



### **Audios :**

Contains audio used by this car



### **pivot\_CarSelection :**

This position is used to know where to spawn the car in the menu car selection.

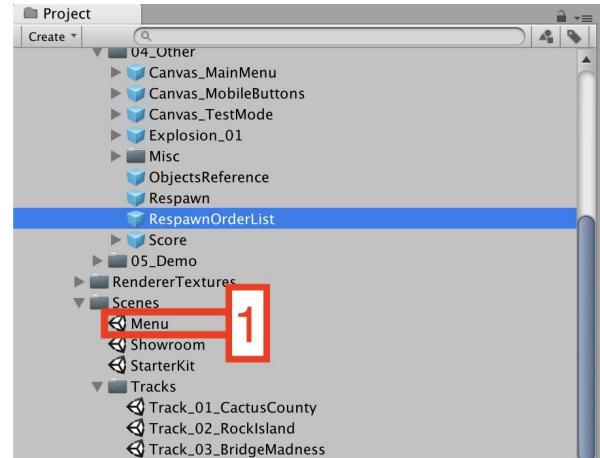


## 10Bis.1 Add a new car in race

### Step 1: Add new Player to the car selection Manager

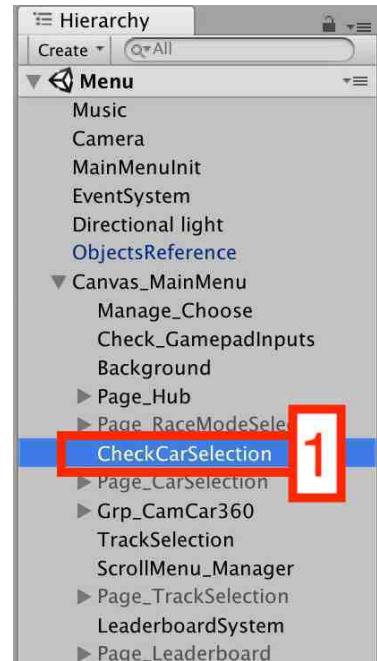
-Open **Menu** scene.

(MCR → Assets → Scenes → *Menu*).

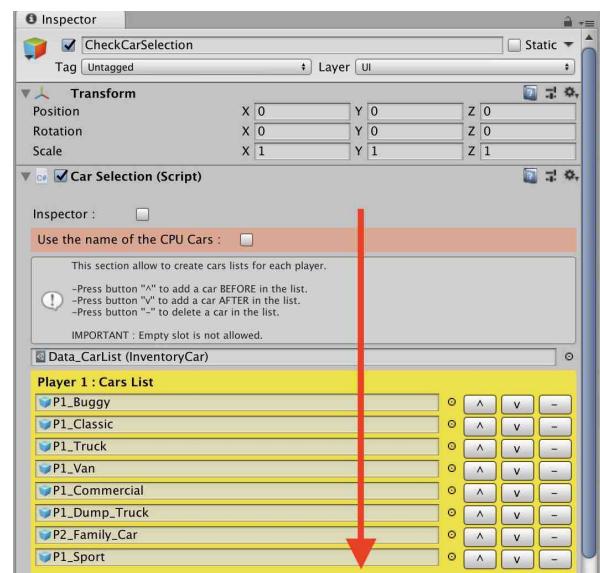


-In the Hierarchy select **CheckCarSelection** (spot 1).

(Hierarchy → *Canvas\_MainMenu* → )



-In the Inspector go to the end of the script **car Selection**.

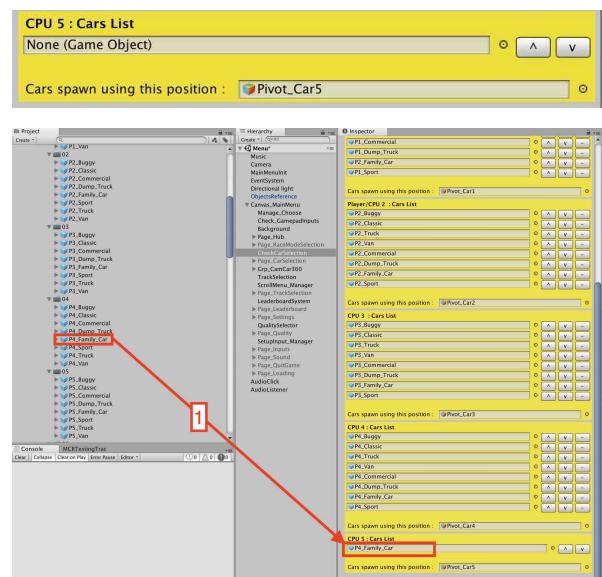


-Click on button **Create new Player**.



A new player is created.

-Drag and drop the car **P5\_Family\_Car** in the Empty slot (spot 1)  
(MCR → Assets → Prefabs → 01\_Car → 05 → )



**Info:** Repeat Step 1 for each Player it is needed to create. Then go to the next section to **create and setup the cars position on the starting line**.

## 10Bis.2 Create and set cars position on starting Line

In this section we are going to use the scene *Track\_01\_CactusCounty* for the example.  
8 Players have been already setup in the Main Menu

### Important:

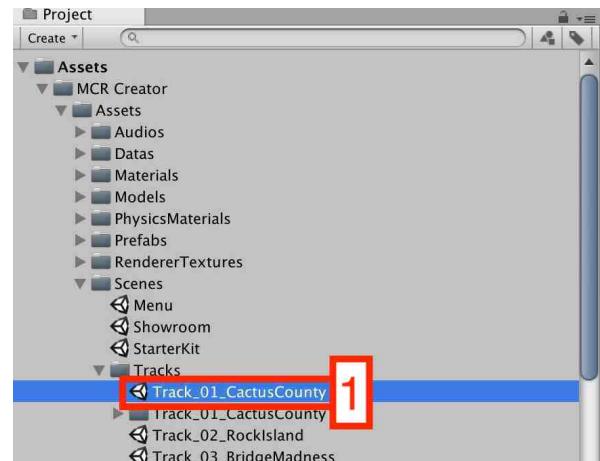
Before reading this section it needed to have created all the players cars needed for the game. If all the players cars have not been created read this section first ([more info here](#))



### Step 1: Create car position on starting Line

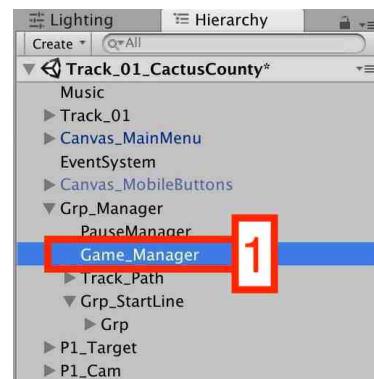
-In Project Tab open *Track\_01\_CactusCounty* (spot 1)

(*MCR Creator* → *Assets* → *Scenes* → *Tracks* → )



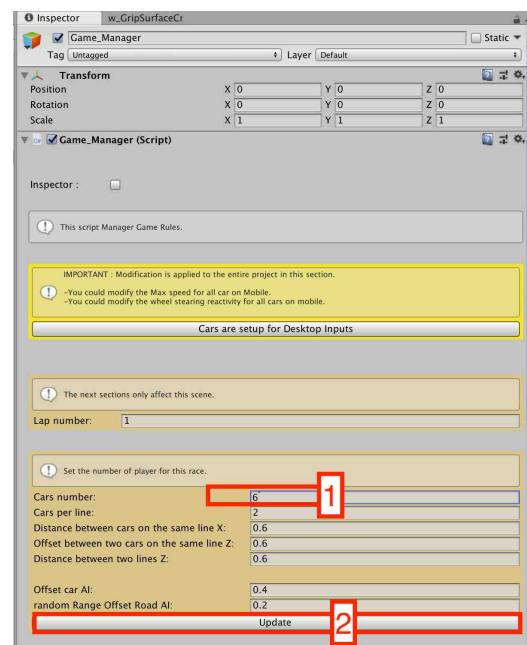
-In the Hierarchy select the *Game\_Manager* (spot 1)

(*Hierarchy* → *Grp\_Manager* → )



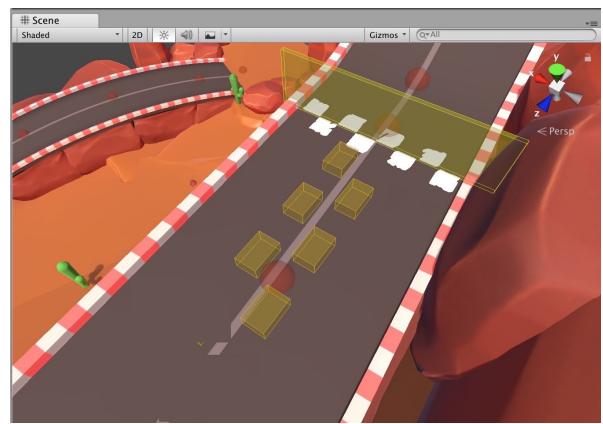
-In the Inspector write 6 in the Car number parameter (spot 1)

-Press button **Update** to apply the modifications (spot 2)



**Info:**

Modifications have been applied in the scene view.  
6 car positions have been created in the starting line.



Other parameters are available to create car positions in the starting line.

For this second example set:

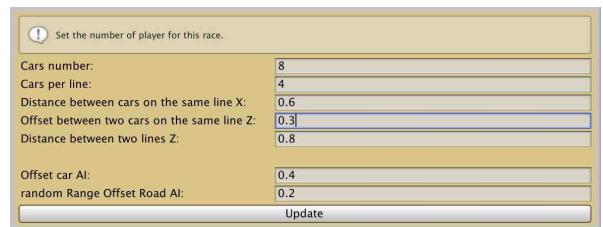
Car number = 8

Cars per Line = 4

Distance between cars on the same line X = 0.6

Offset between two cars on the same line Z = 0.3

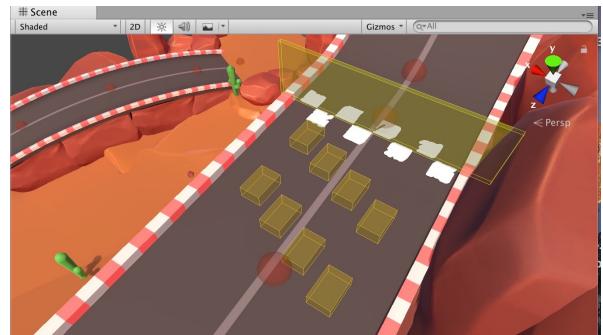
Distance between two lines Z = 0.8



The result is:

-4 cars by lines.

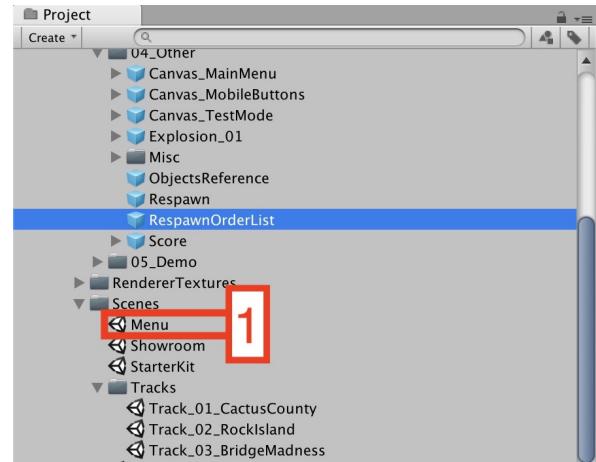
-2 lines



### 10Bis.3 Remove a Player

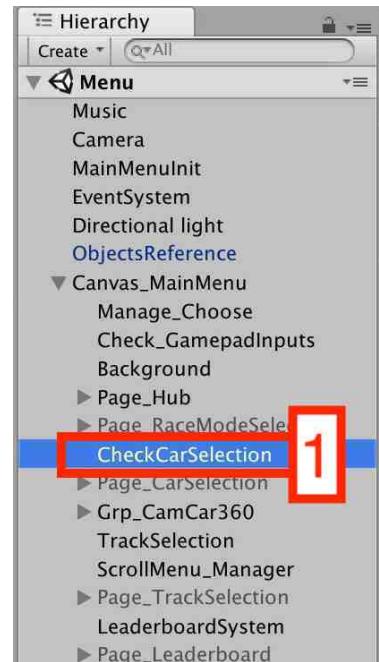
-Open **Menu** scene.

(MCR → Assets → Scenes → Menu).

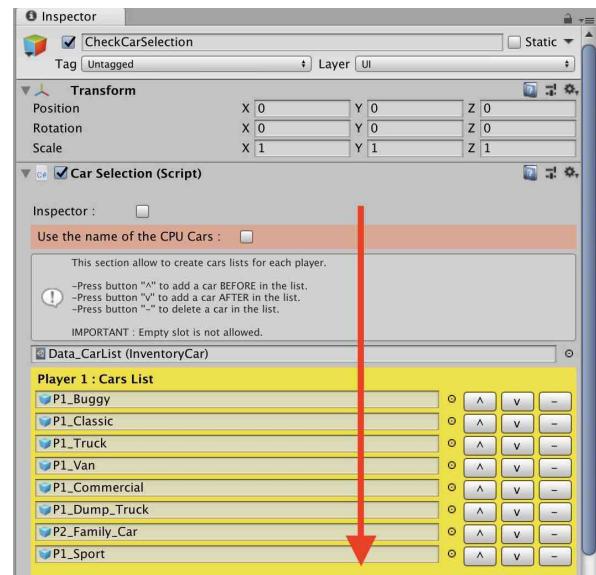


-In the Hierarchy select **CheckCarSelection** (spot 1).

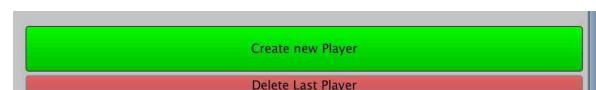
(Hierarchy → Canvas\_MainMenu → )



-In the Inspector go to the end of the script car Selection.



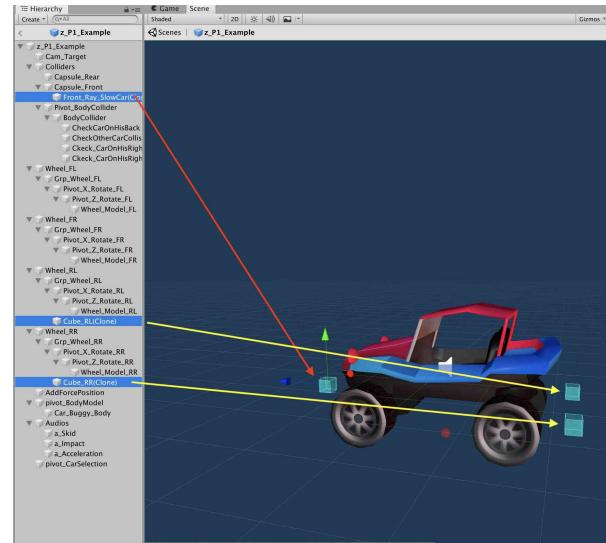
-Click on button **Delete Last Player**.



## 10.4 Improve car collision with wall.

Since Minicar Race Creator v1.4:  
 3 objects have been added in the car prefab.  
 Those objects improve wall collision.

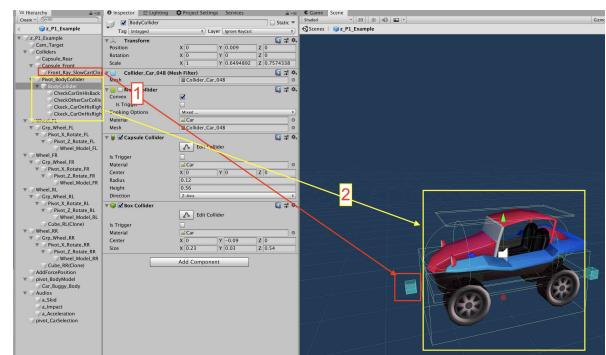
Front\_Ray\_SlowCar  
 Cube\_RL  
 Cube\_RR



**Info:** Each car is different.  
 So it is needed to adapt the position of those 3 objects depending your car.

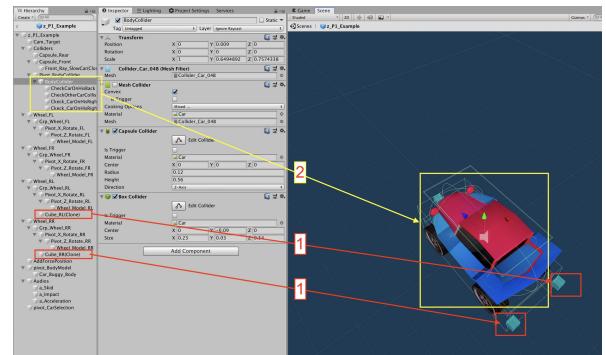
Front\_Ray\_SlowCar must be in front of the car (spot 1).

This object must not touch colliders contained in group BodyCollider (spot 2)



Cube\_RL and Cube\_RR must be behind the car (spot 1).

This object must not touch colliders contained in group BodyCollider (spot 2)



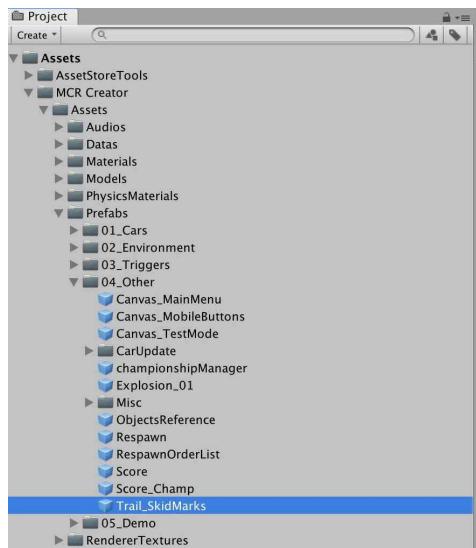
**Tips:** Have a look to the cars included in the asset to see the position of these 3 objects for each type of car.

## 10.5 Skid Mark:

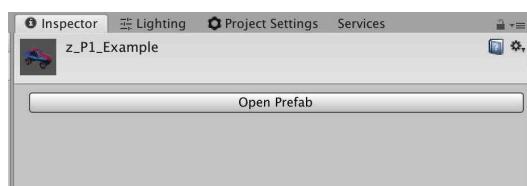
### Change the Skid duration:

-In the Project Tab select Trail\_SkidMarks prefab.

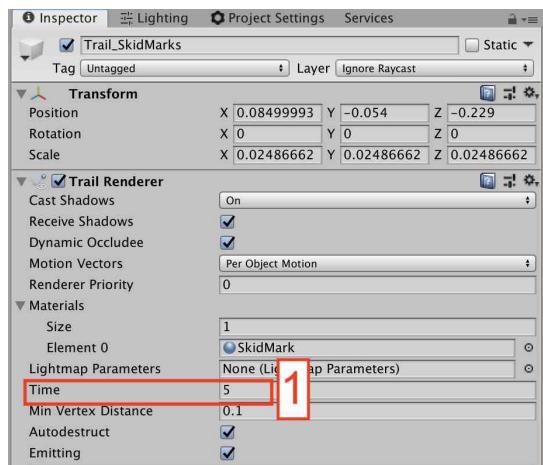
(Project tab → MCR Creator → Assets → Prefabs → 04\_Other → Trail\_SkidMark)



-In the Inspector press the button Open Prefab.



-In the Inspector change the value Time (spot 1) to change the trail duration.

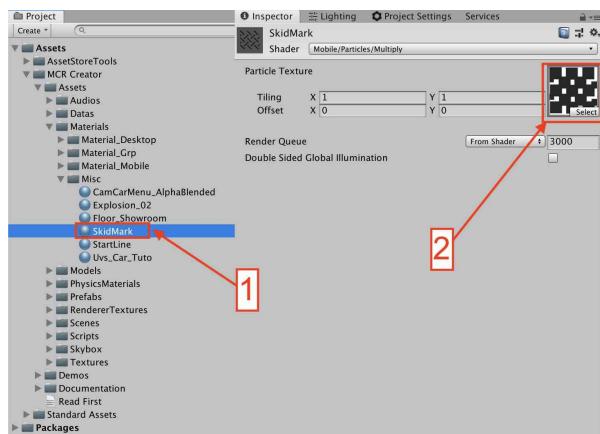


### Change Skid Mark texture:

-In the Project Tab select SkidMarks material (spot 1).

(Project tab → MCR Creator → Assets → Materials → Misc → SkidMark)

-In the Inspector replace the texture with your new texture (spot 2).



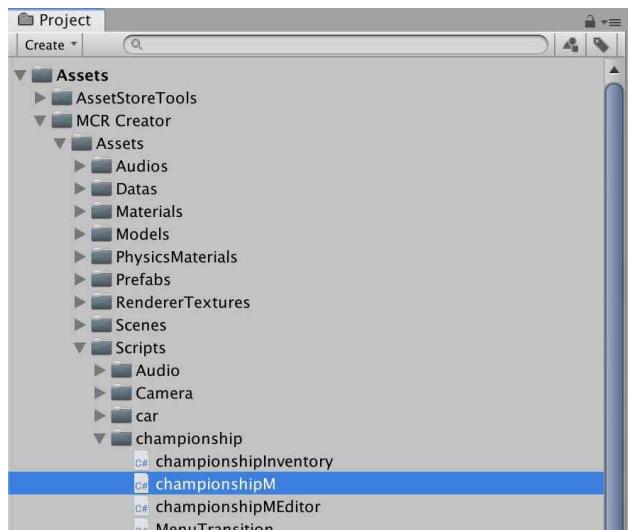
## Disabled Skid Mark:

By default skid marks are enabled.

To disable skid marks:

-Open the script **championshipM** in your script editor.

(Project tab → MCR Creator → Assets → Scripts → Championship → championshipM).



Line 42 replace:

b\_GlobalSkidMark = true;

by

b\_GlobalSkidMark = false;

Now when a race starts the skid marks are disabled.

A screenshot of the Visual Studio Community 2017 for Mac code editor. The file 'championshipM.cs' is open. A red box highlights line 42, which contains the code 'b\_GlobalSkidMark = false;'. To the right of the line number 42 is a red box containing the number '1'. The code editor shows several other lines of C# code related to game management and object tracking.

```
10     public static championshipM instance = null;           //Static instance of GameManager
11     public championshipInventory champInventory;
12
13     public List<bool> listChampionshipState = new List<bool>();
14     public int currentSelectedChampionship = 0;
15     public int currentTrackInTheList = 0;
16
17     public List<int> listScore = new List<int>();
18
19     public bool b_InitSave = false;
20
21     public bool b_GlobalSkidMark = true;
22
23     void Awake()
24     {
25         //Check if instance already exists
26         if (instance != null)
27             //If not, set instance to this
28             instance = this;
29
30         //If instance already exists and it's not this:
31         else if (instance != this)
32             //Then destroy this. This enforces our singleton pattern, meaning there can only ever
33             Destroy(gameObject);
34
35
36         GameObject[] allObjectTaggedWall = GameObject.FindGameObjectsWithTag("Wall");
37         foreach (GameObject obj in allObjectTaggedWall)
38         {
39             obj.layer = 16;
40         }
41
42         b_GlobalSkidMark = false; 1
43
44     }
```

## 11-Demo Mode

### 11.1- How it works :

Test Mode Panel is used to test a track.

IMPORTANT : If **Test Mode** is activated all the scene are affected by the Test Mode.

When a scene is launched and :

**Case 1 : Test Mode** is activated :

The scene is initialized using the **Test Mode Panel** parameters.

**Case 2 : Test Mode** is deactivated :

The scene is initialized using the parameters setup on scene **Menu** :

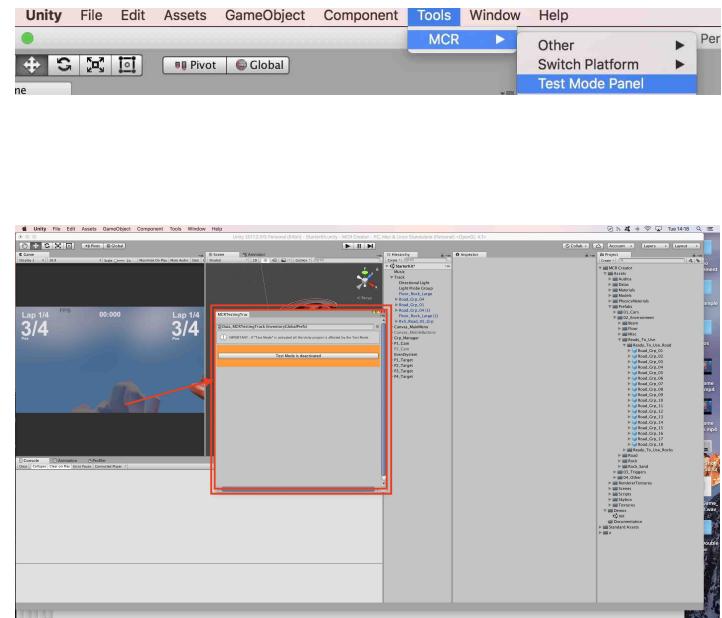
*Project tab → MCR Creator → Assets → Scenes  
→ Menu*

### 11.2-How to open the Test Mode Panel

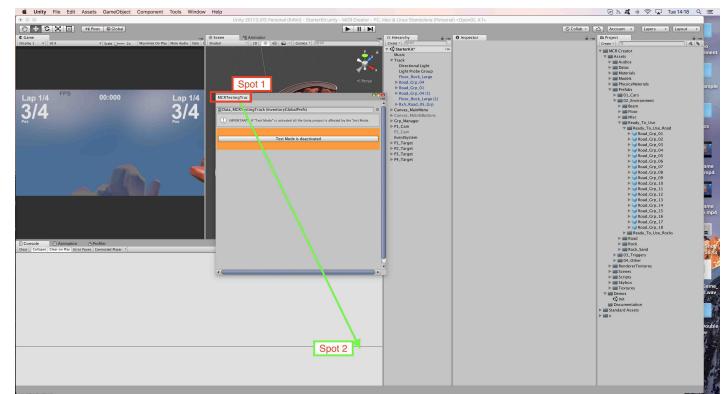
Open Menu : Tools → MCR → Test Mode Panel

A new window appears.

It could be great to have this window always visible on your Layout.

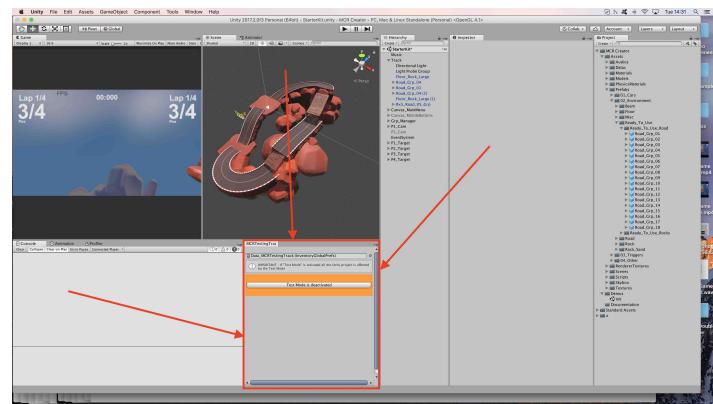


- Click on the name of the tab (Spot 1)
- Then drag the window on spot 2.
- Then release the mouse button.



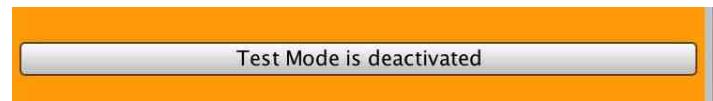
The tab is now attached to the layout

More info here :  
<https://docs.unity3d.com/Manual/CustomizingYourWorkspace.html>



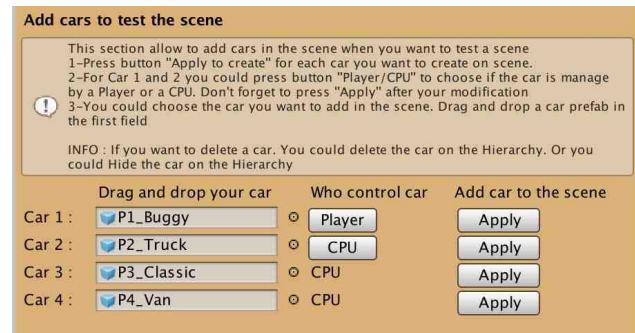
### 11.3- Panel Overview :

The first button has two states that allow to activate or deactivate **Test Mode**.



If Test Mode is activated you could access more parameters :

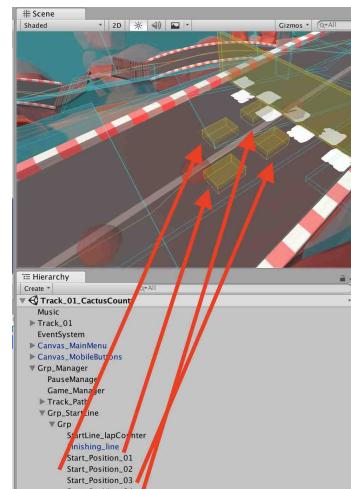
This section allow to add Test cars in the scene.



1-Press button **Apply** for each car you want to create on scene.



Car spawns on scene using Start\_Position on scene view

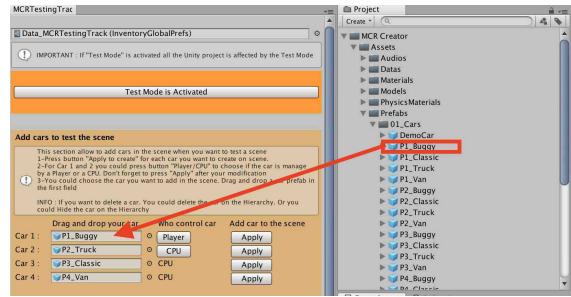


2-For Car 1 and 2 you could press button **Player/CPU** to choose if the car is manage by a Player or a CPU. Don't forget to press **Apply** after your modification



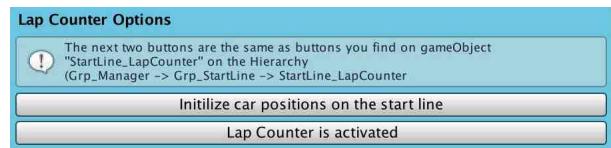
3-You could choose the car you want to add in the scene.  
Drag and drop a car prefab in the first field

**IMPORTANT :** If you want to delete a car.  
You **NEED** to delete the car on the Hierarchy. Or you could Hide the car on the Hierarchy



**Initialize car position on the start line :**  
Move the car to their init position.

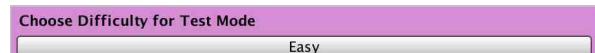
**Lap Counter is activated :**  
Allow to activate or deactivate lap counter when the scene starts.



**Countdown is activated :**  
Activate or deactivate countdown when the scene starts.



Choose the difficulty mode for this race



#### 11.4 How to know if Test Mode is activated:

As you could see when the scene start on the bottom left **Test Mode** is displayed on screen.

*If test Mode is not activated text is not displayed*



## 12 Path Tips

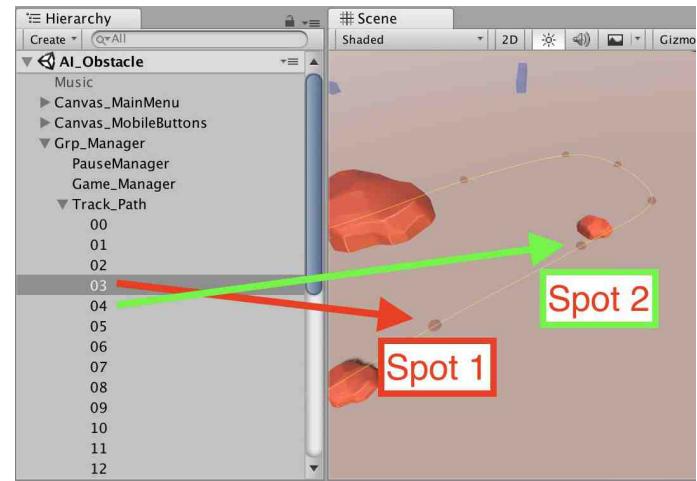
### 12.1 Add a point between two points that had been already created :

We use AI\_Obstacle for the next example.

Project tab : MCR Creator → Assets → Scenes →

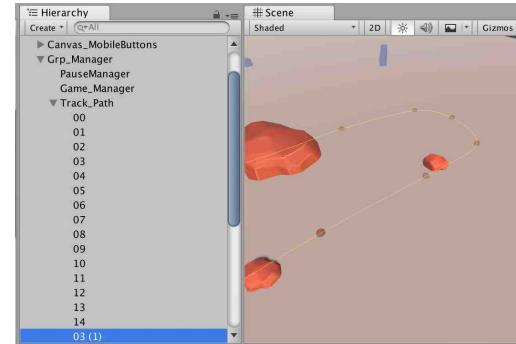
Tuto → AI\_Obstacle

**Example :** create a point between point 03 (spot 1) and point 04 (spot 2)



1- Duplicate gameObject 03.

A new gameObject is created named 03  
(1)

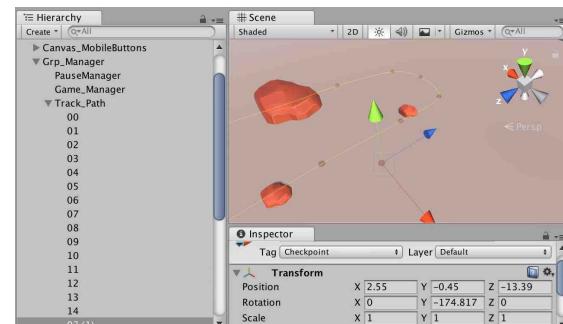


2- Move 03 (1) to this position

Position X = 2.55 Y = -0.45 Z = -13.39

Rotation X = 0 Y = -174.8 Z = 0

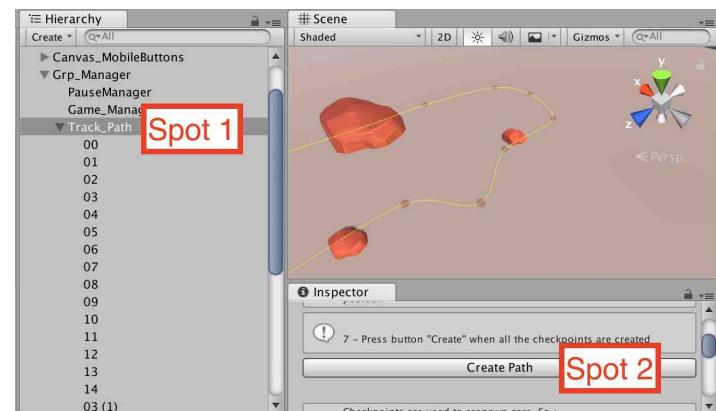
Scale X = 1 Y = 1 Z = 1



3- Select **Track\_Path** on the hierarchy (spot1).

Hierarchy tab : Grp\_Manager → Track\_Path

4- Press button **Create Path** on the Inspector (spot 2).



## 12.2 Delete a point :

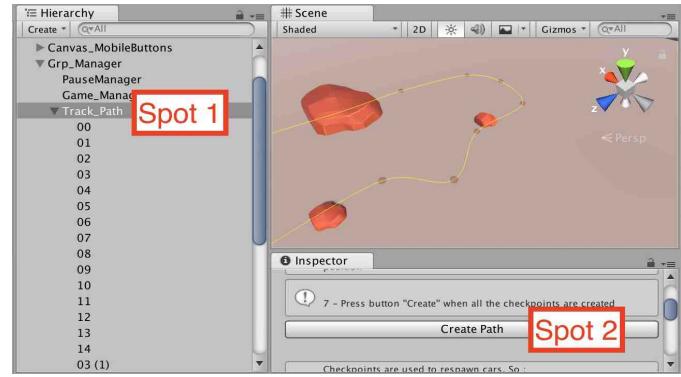
1- Select the point you want to delete.

2-delete the point from the Hierarchy

3- Select **Track\_Path** on the hierarchy (spot1).

Hierarchy tab : Grp\_Manager → Track\_Path

4- Press button **Create Path** on the Inspector (spot 2).

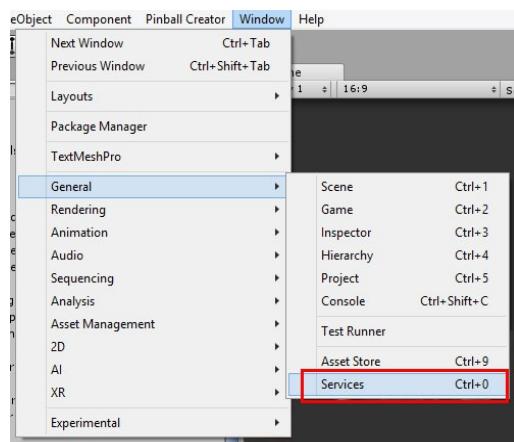


## 13-Unity Ads : How to setup

### 13.1- Unity Ads : How to setup

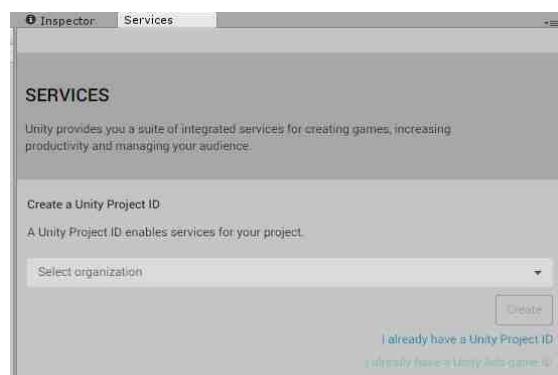
**INFO : It is possible to have some little variations depending your unity version**

1 - Select **Menu → Window → General → Services**



2 – Select your Organization on the list.

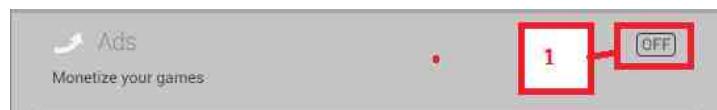
If you don't have a Unity ID go to :  
<https://id.unity.com/en/conversations/7c02d4ab-c395-4ea0-bae3-4ea84cd36dff006f?view=register>



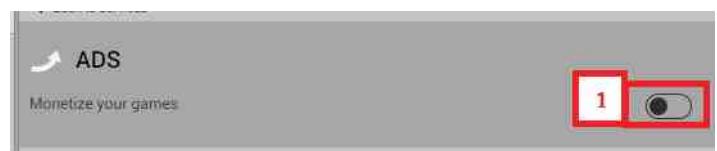
3 – Press button **create**



4 – Enable Ads by pressing the button **Off** (spot 1)



5 – Press the **switch** (spot 1)



6 – Press button **continue**.



7 – Next screen appear. Press **switch** (spot 1)



## 8 – Go to **Settings** section (spot 1)

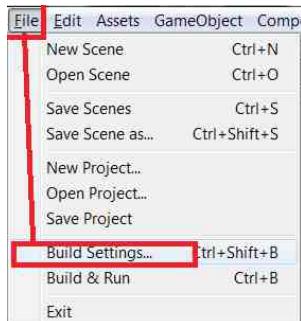
- Enable **test Mode**. (Don't forget to disable it when you released your game) (spot 2)



## 9 - IMPORTANT :

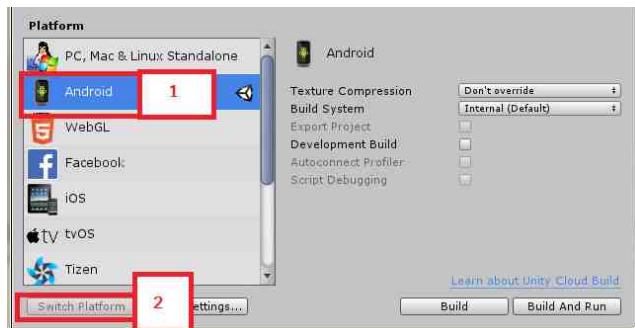
Ads Test Mode only works if you've choose a mobile platform in the build settings tab.

Menu → Build Settings



## 10- If you are not on mobile platform.

Select  
Android or iOS (spot 1)  
Then press **switch Platform** (spot 2).

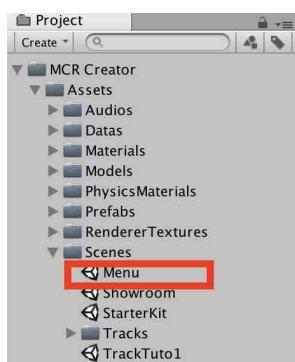


## 13.2 Unity Ads : Launch Ads when player pressed a button

**Example** : Add Ads on button **Solo**.  
Before doing these steps you need to setup Unity Ads ([more info here](#))

### 1– Open scene **Menu**

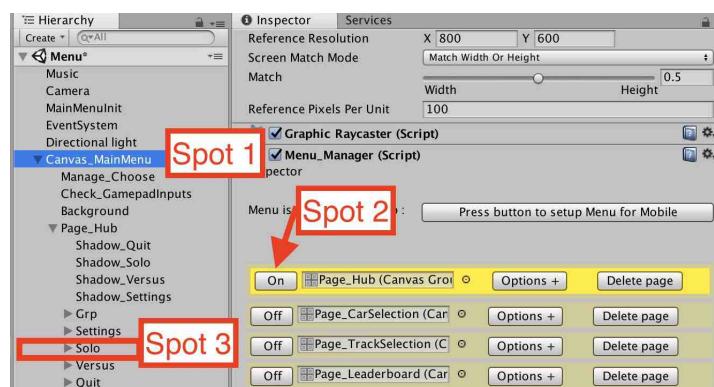
Project Tab → MCR Creator → Assets → Scenes  
→ **Menu**



2- On the Hierarchy select **Canvas\_MainMenu** (spot 1)  
*Hierarchy tab : Canvas\_MainMenu*

3- Press the first button **On** on the Inspector (Spot 2)

4- Select **Solo** on the Hierarchy (spot 3)



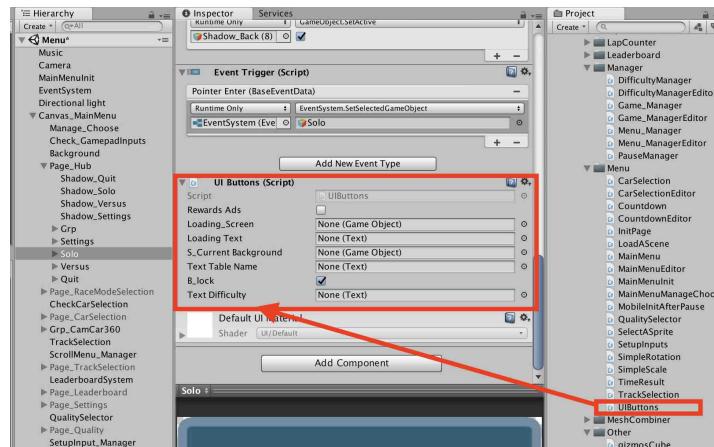
*Info :The button need to have the script "UIButtons" attached to it*

5- Drag and drop the script in the inspector view.

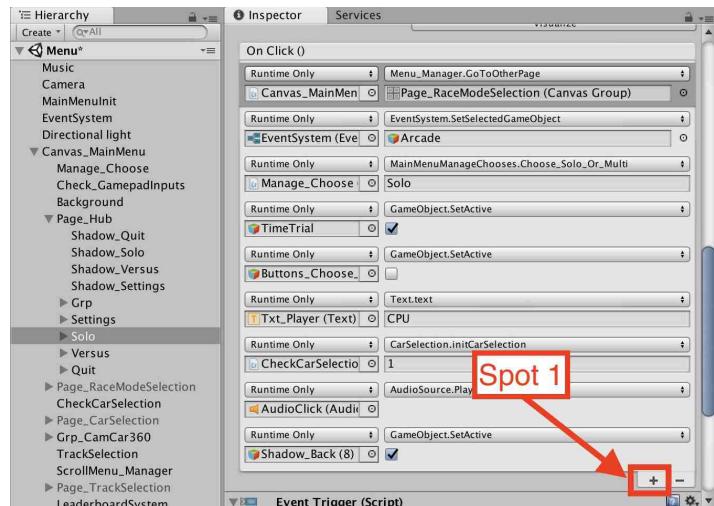
*Project tab : MCR Creator → Assets → Scripts → Menu → UIButtons*

Or

Use the button **add component** to add this script to the button



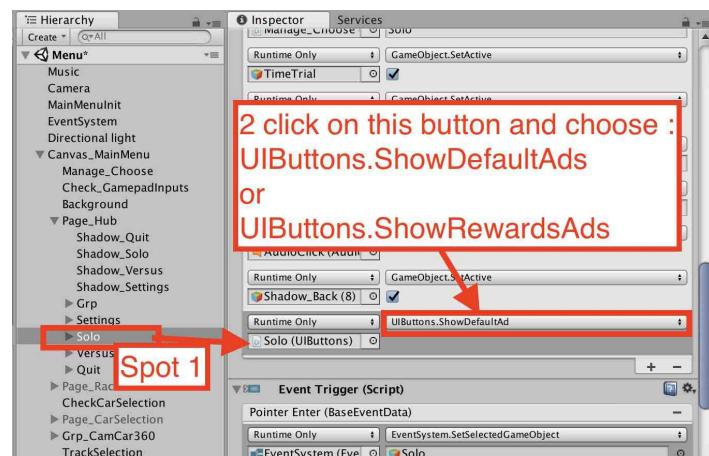
6- On the Inspector go to the section **OnClick** and press the button **+** (Spot 1)



7- Drag and drop your button inside the new empty slot (spot 1)

8- Choose on the list the function `UIButtons.ShowDefaultAd` (spot 2).

*Info : You could choose the function `UIButtons.ShowRewardedAds()` if you want to use a reward Ads*



9- Start your scene.



10- Press the button Solo on your scene. Add starts when you press Play button.



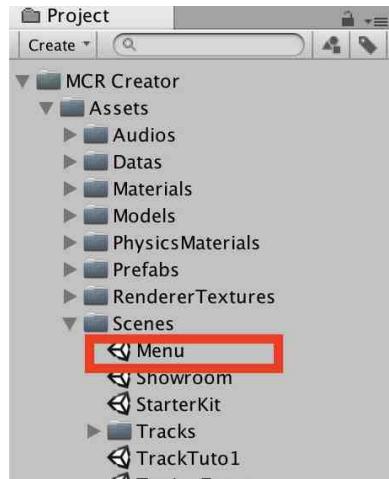
### 13.3 Unity Ads : Unlock track with an Ad or anything else

**Example :** Add Ads on button Play.

Before doing these steps you need to setup Unity Ads ([more info here](#))

#### 1– Open scene Menu

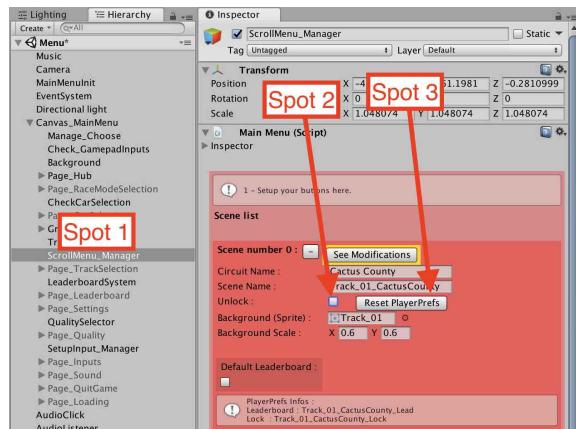
Project Tab → MCR Creator → Assets → Scenes  
→ Menu



#### 2- Select ScrollMenu\_Manager in the Hierarchy Tab (spot 1)

#### 3- Uncheck the box unlock (spot 2)

#### 4- Press Reset PlayerPrefs for each lock to init the playerPrefs referring to this lock (spot 3)



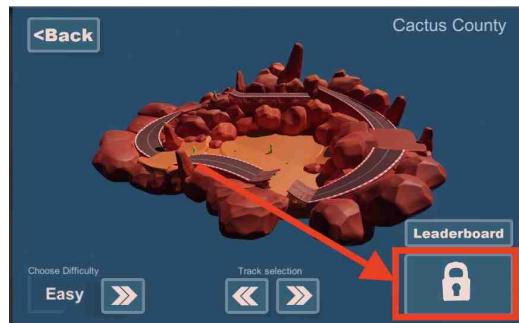
#### 5 – Start your scene.



#### 6 – Press the button Button\_Play on your scene. An Ad Rewards starts.

*When the ad is finished the lock is unlocked*

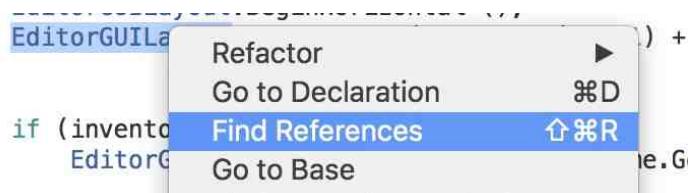
*Press again Button\_Play to launch the track*



## 14-Scripting

### 14.1- Tips : Find references in MonoDevelop

If you want to know which script use a specific function :



**Right Click** and Choose **Find references** to see all the scripts that use this function.  
It is very useful.

### 14.2- Some informations are saved when player make choices on Menu scene.

The next PlayerPrefs help recover these information on track scenes.

#### Access the current selected car for Player 1 and Player 2.

```
// Save the current Car Selection for the selected player  
PlayerPrefs.SetInt ("Player_" + playerNumber + "_CarLastSelection", ListOfCars[playerNumber].  
CurrentCarSelection );
```

Use in :  
CarSelection.cs  
Game\_Manager.cs

#### Access the current selected car for Player 1 and Player 2.

```
PlayerPrefs.SetInt ("HowManyPlayers", 2);
```

1 = One player  
2 = Two players

Use in :  
CarSelection.cs  
Game\_Manager.cs  
TrackSelection.cs  
MainMenuManager.cs

#### Access Game Mode.

```
PlayerPrefs.SetString ("Which_GameMode", "Arcade");  
PlayerPrefs.SetString ("Which_GameMode", "TimeTrial");
```

Use in :  
Game\_Manager.cs  
MainMenuManageChooses.cs  
TrackSelection.cs

## Access the difficulty Mode

PlayerPrefs.GetInt ("DifficultyChoise");  
0 = easy  
1 = Medium  
2 = Expert

Use in :  
*Game\_Manager.cs*  
*MCRTestingTrack.cs*  
*UIButtons.cs*

## 14.3- Leaderboard : Access score and name when race is finished

When the race is over and the race is in Trial Mode it is possible to Access to the player score with :

PlayerPrefs.GetInt("CurrentScore") ;  
Or  
call PlayerScore() from the script LeaderboardSystem.cs that could find on gameObject LeaderboardSystem  
(this function return a integer)

If you want to convert the value in time / minutes / seconds use the function F\_Timer() on LeaderboardSystem.cs



```
string PlayerName(){  
    return txt_PlayerName.text;  
}  
  
int PlayerScore(){  
    return PlayerPrefs.GetInt ("CurrentScore");  
}
```

## Access the player name with :

PlayerName() from the script LeaderboardSystem.cs that could find on gameObject LeaderboardSystem  
(this function return a string)

## 14.4- Access race track leaderboard and Lock PlayerPrefs

### 1- Open Scene Menu (spot 1)

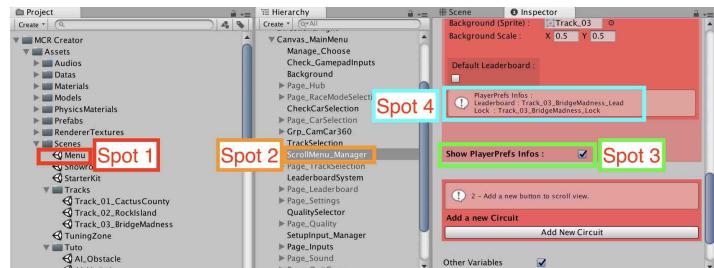
Project tab : MCR Creator → Assets → Scenes → Menu

### 2- Select ScrollMenu\_Manager in the Hierarchy (spot 2)

Hierarchy tab : Canvas\_MainMenu → ScrollMenu\_Manager

### 3- To see PlayerPrefs Infos press the button Show Player Prefs Infos (spot 3)

Then you could see Leaderboard playerPrefs name and Lock playerPrefs for each table (spot 4)



Call the Leaderboard : PlayerPrefs.GetString(Name of your track scene + "\_Lead")

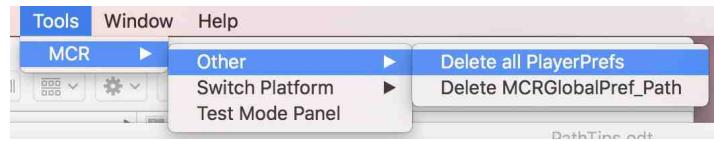
**Call the PlayerPrefs to know if the table is locked** : PlayerPrefs.GetString(Name of your track scene + "\_Lock")

The lock is unlocked if PlayerPrefs.GetString(Name of your track scene + "\_Lock") == "Unlocked"

### Tips : Init PlayerPrefs

If you want to init your PlayerPrefs go to

**Tools → MCR Creator → Other → Init PlayerPrefs**

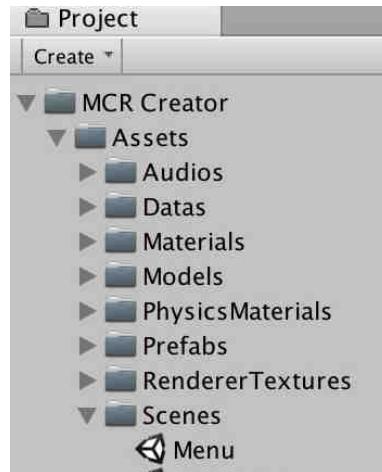


## 15-Inputs

### 15.1 Setup default inputs :

1- Open scene **Menu** on Project tab

Project tab : MCR Creator → Assets → Scenes → Menu



2- Select **SetupInput\_Manager** on the hierarchy tab (spot 1)

3- On the Inspector modify the default inputs on script **Setup default inputs** (spot 2)

#### Note :

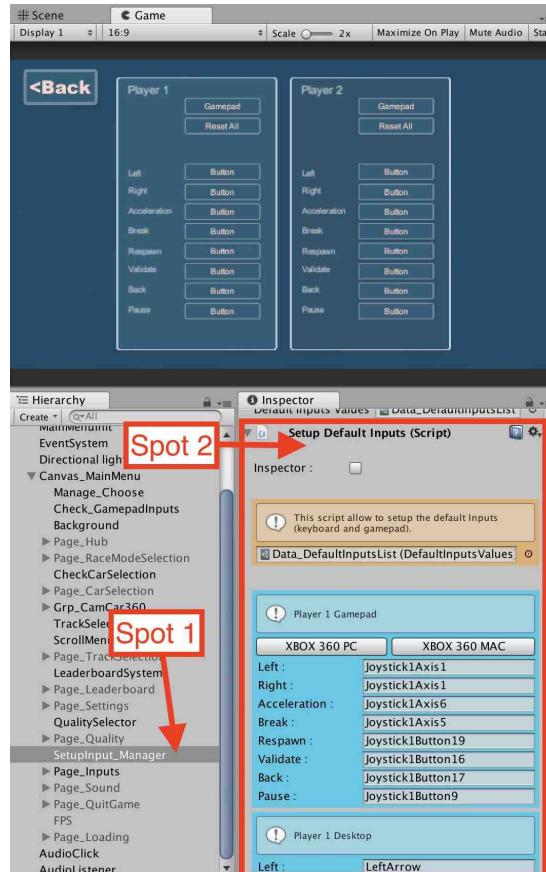
Xbox 360 PC button allow to use default values for Xbox 360 gamepad on PC.

Xbox 360 MAC button allow to use default values for Xbox 360 gamepad on MAC.

For keyboard you could use any Keycode  
<https://docs.unity3d.com/ScriptReference/KeyCode.html>

For gamepad you need to use the input name setup in the **Input Manager**.

Edit → Project Settings → Input

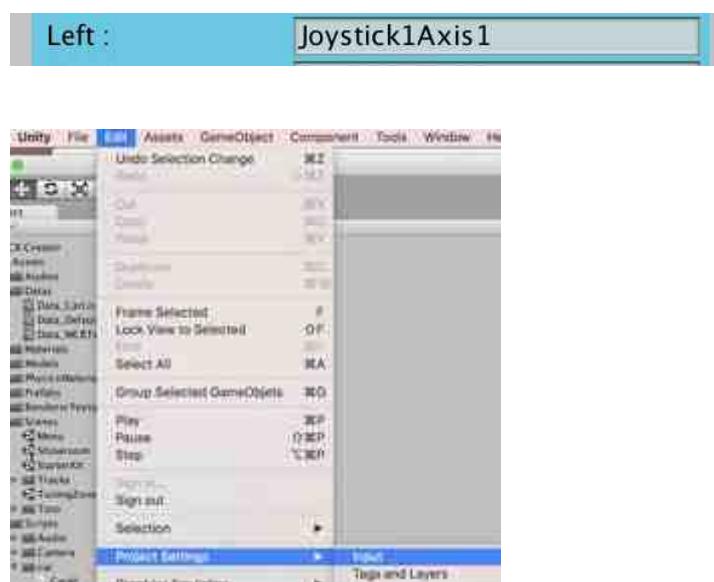


You find more information about xbox gamepad here : <http://wiki.unity3d.com/index.php?title=Xbox360Controller>

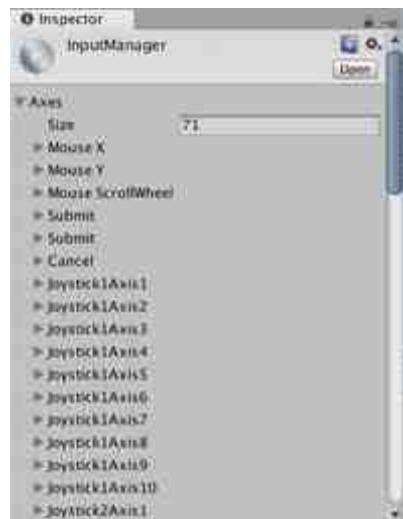
**Example : Change Left gamepad 1 default input.**

For gamepad 1 and 2 you need to choose an input setup in Unity **Input Manager**

Edit → Project Settings → Input



On the Inspector you could see the list of inputs you could use.



When you have chosen your Input replace the string field with the Input name.



## 16-Troubleshooting

### Avoid car climbing an object :

Car could not climb an object if this gameObject use the tag **Wall**



Sometime car is black on mobile platform

More Info [here](#)

## 17-Championship

### 17.1-How to setup a championship

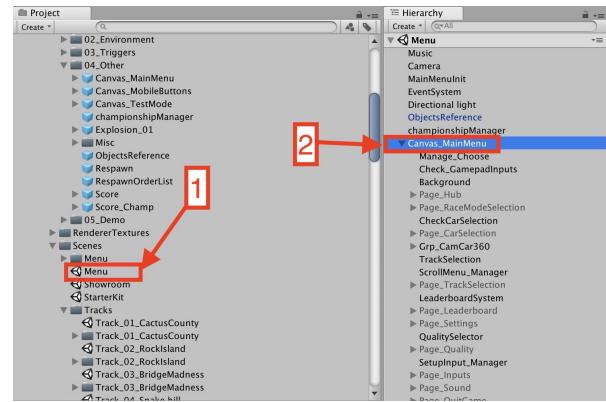
**Info:** For the example we are going to create a new championship called Dust Championship. There will be two tracks in the championship.

#### -Open the scene Menu (spot 1)

(Project tab → MCR Creator → Assets → Scenes → )

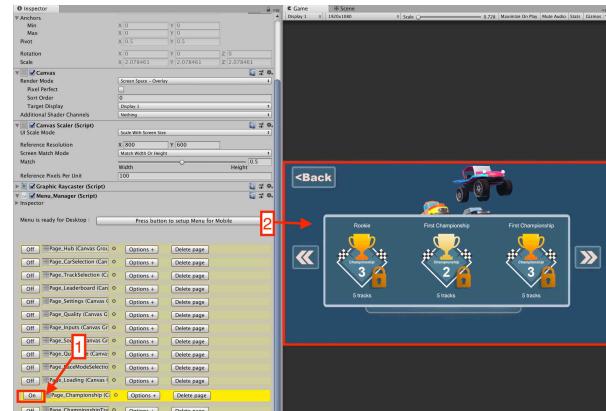
#### -In the Hierarchy select Canvas\_MainMenu (spot 2)

(Hierarchy → )



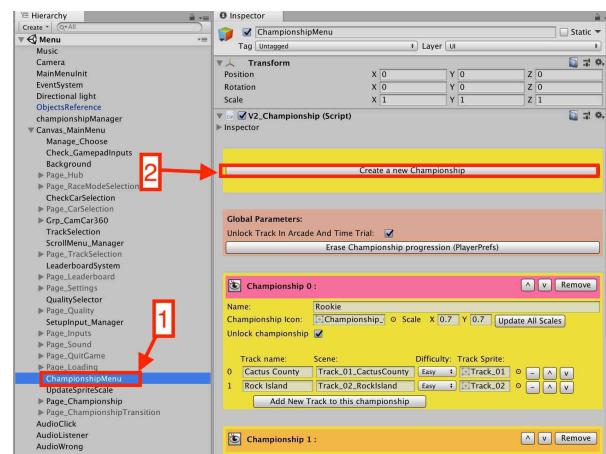
#### -In the Inspector click on the button Off next to field Page\_Championship (spot 1)

**Info:** In the game view the menu championship is display on screen (spot 2)



#### -In the Hierarchy select ChampionshipMenu (spot 1)

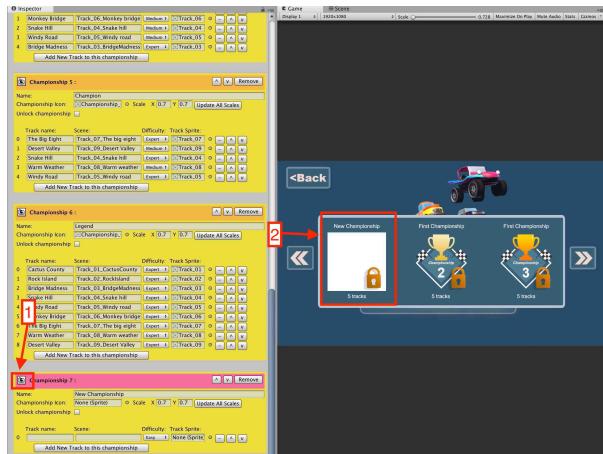
(Hierarchy → Canvas\_MainMenu → )



#### -In the Inspector click on button Create a new Championship (spot 2)

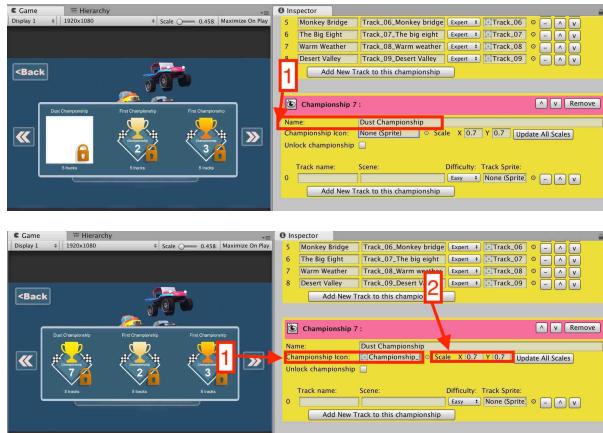


-Click on button with an eye next to the text **Championship 7** (spot 1)



**Info:** This button allows to show the modifications on this championship directly in game view (spot 2)

-In the field **Name** write:  
**Dust Championship** (spot1)

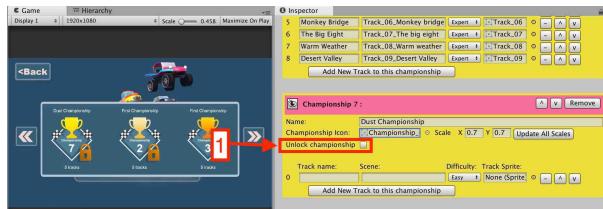


-In the field **Championship Icon** drag and drop the sprite **Championship\_08B\_Logo** (spot 1)  
(Hierarchy → MCR Creator → Assets → Textures → 04\_Sprites → Interface → Championship → )

**Tips:** We suggest you to use 512x512px sprite.

**Info:** Nevertheless it is possible to change the scale of a sprite using the fields **Scale X** and **Y** (spot 2)

-Check the box **Unlock championship** (spot 1)  
The championship will be available immediately after starting the game.



**Info:** In the example we are going to use the track **Track\_04\_Snake hill** and the track **Track\_05\_Windy road**

-In the field **Track name** write **Snake Hill** (spot 1).  
This name is use in the screen displayed before the beginning of the track.

-In the field **Scene** write **Track\_04\_Snake hill** (spot 2)



**VERY IMPORTANT:** You must write exactly the same name as the name of the scene used.  
Remove space after the name.

-Change difficulty to **Medium** (spot 3)



- In the field **Track Sprite** drag and drop the sprite **Track\_04** (spot 1)

(Hierarchy → MCR Creator → Assets → Textures → 04\_Sprites → Interface → Championship → Track\_Choice → Tracks → )

This sprite is use in the screen displayed before the beginning of the track.



**VERY IMPORTANT:** In the same championship all tracks must have been configured for the same number of players.

For example, if the first track of the championship is set for 8 players, all other tracks in the championship must be configured for 8 players as well.

- Click on button **Add new track to this championship** (spot 1)



-In the field **Track name** write **Windy Road** (spot 1). This name is use in the screen displayed before the beginning of the track.

-In the field **Scene** write **Track\_05\_Windy road** (spot 2)



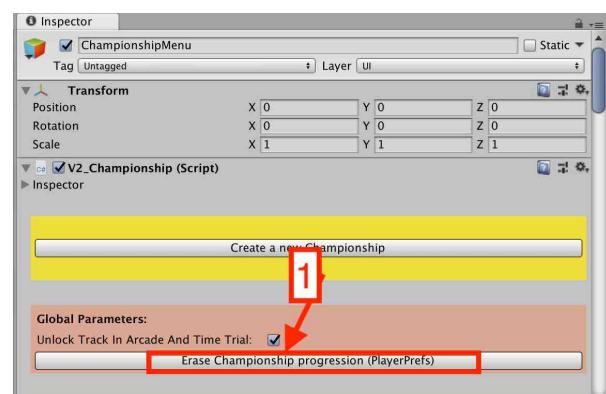
**VERY IMPORTANT:** You must write exactly the same name as the name of the scene used. Remove space after the name.

-Change difficulty to **Easy** (spot 3)

- In the field **Track Sprite** drag and drop the sprite **Track\_05** (spot 4)

(Hierarchy → MCR Creator → Assets → Textures → 04\_Sprites → Interface → Championship → Track\_Choice → Tracks → )

-In the Inspector go to the beginning of the script and click on button **Erase Championship progression (PlayerPrefs)** (spot 1) to initialized and update the championship mode with the new championship.



-Click on **Play** button to start the game.



-Select **Solo / Championship** / Choose your car and press **validate** / Press button **Dust Championship**.

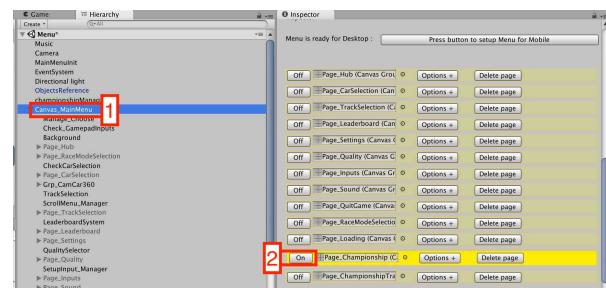
**Info:** Before starting the first race you see the sprite we choose for the next track.

-Press **Play** button to stop the game.



-In the Hierarchy select **Canvas\_MainMenu** (spot 1)

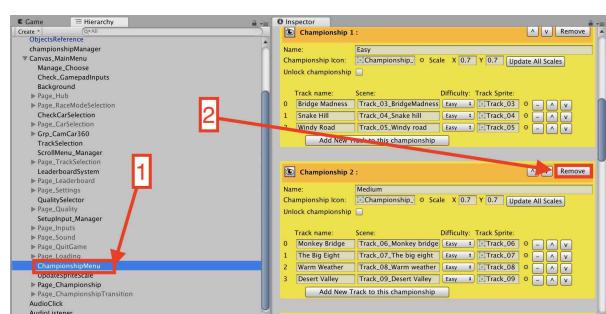
-In the Inspector press button **Off** next to **Page\_Hub** (spot 2).



## 17.2-How to Delete a Championship

-In the Hierarchy select **ChampionshipMenu** (spot 1)  
(Hierarchy → *Canvas\_MainMenu* → )

-In the Inspector click on button **Delete** net to the championship you want to delete (spot 2)



-In the Inspector go to the beginning of the script and click on button **Erase Championship progression (PlayerPrefs)** (spot 1) to initialized and update the championship mode.

