



Making an Augmented Reality Book



DIGIJEUNES



01

WHAT WILL BE NEEDED

You will be needing an android phone with at least android 8.0.

You will also need the software Unity to make this application.

If you dont have it yet there will be instructions on how to do so.

This project will be using Unity 2020.3.38f1 (LTS) or earlier versions of Unity 2020.3.XXf1.

You will need to install Java JDK and JRE. There will be steps for the installation.

This project will be using Vuforia 10.8. There will be steps on how to install it later on.

Downloading unity and registering

Step 1: Go to the following URL: https://store.unity.com/front-page?check_logged_in=1#plans-individual, and click on the button 'Get started'.

Plans and pricing

We offer a range of plans for all levels of expertise and industries.
All plans are royalty-free.

- All plans are **royalty-free**. You keep what you earn.
- All plans include access to the **Unity Asset Store**, a marketplace of assets for your projects.
- All plans include access to **Unity Learn**. Support your team's expertise at every level.

Individual Teams Enterprise

Student

Learn the tools and workflows professionals use on the job

Free

[Sign up](#)

Eligibility:
Students 18 years and older who are enrolled in an accredited educational institution and can provide consent to the collection and processing of their personal information.

- ✓ Latest version of the core Unity Platform
- ✓ Five seats of Unity Teams Advanced
- ✓ Real-time cloud diagnostics

Personal

Start creating with the free version of Unity

Free

[Get started](#) [Learn more](#)

Eligibility:
Revenue or funding less than \$100K in the last 12 months

- ✓ Latest version of the core Unity Platform
- ✓ Resources for getting started and learning Unity

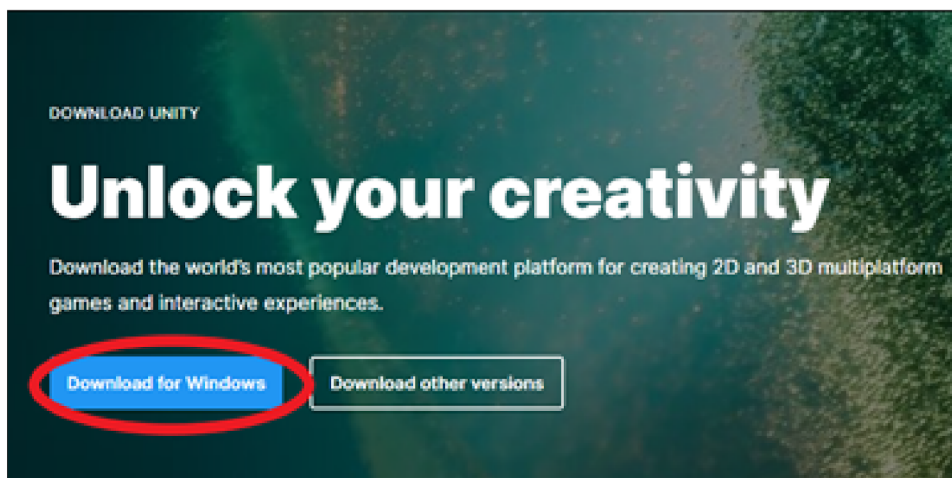
Unity Learn

Master Unity with expert-led live sessions and on-demand learning

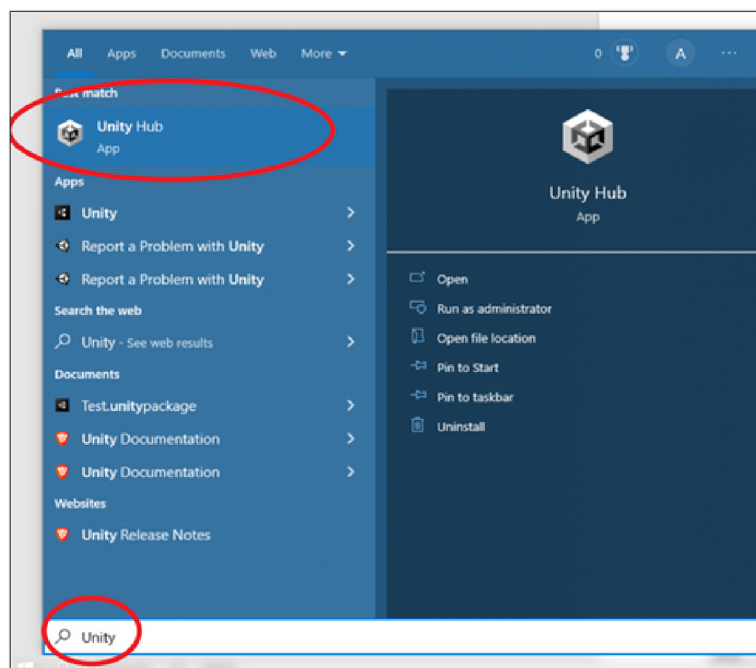
[Start learning](#)

02

Step 2: Click on the button “Download for Windows” and download the installation file. Once the download is finished, double click on the installation file to begin with the installation process.



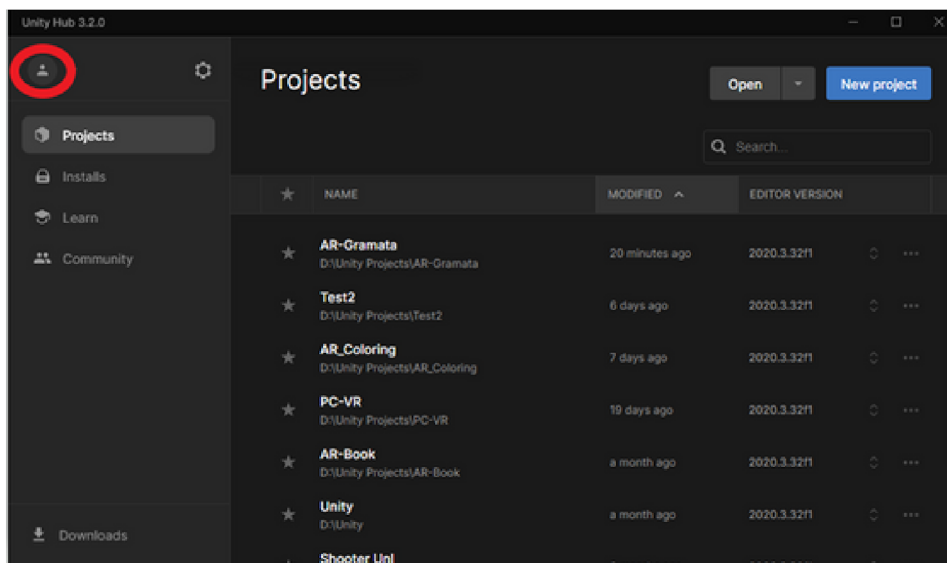
Step 3: To begin creating your project, open the Unity Hub, you can find it by typing “Unity Hub” on the search bar next to the Windows tab on the left inferior corner of the screen. Then, Click on “Unity Hub - Application” once it appears on the search results.



03



Step 4: This is the first screen you will see after opening “Unity Hub”, the first thing you need to do is to create a new Unity account, to do so click on the button on the upper right corner of the screen and click on “Sign-in”.



Step 5: As you might not have a Unity account yet, you should create one first. To do so, click on the button “create one”.

Sign into your Unity ID




If you don't have a Unity ID, please [create one.](#)

Email

Password

Remember me [Forgot your password?](#) [Help](#)

OR

04

Step 6: Fill out all the required fields, don't forget to accept Unity terms of service, privacy policy and marketing activities. When finished, click the "Create Unity ID" button.

Create a Unity ID

If you already have a Unity ID, please [sign in here](#)

Email Password

Username Full Name

I have read and agree to the [Unity Terms of Service](#)(required).

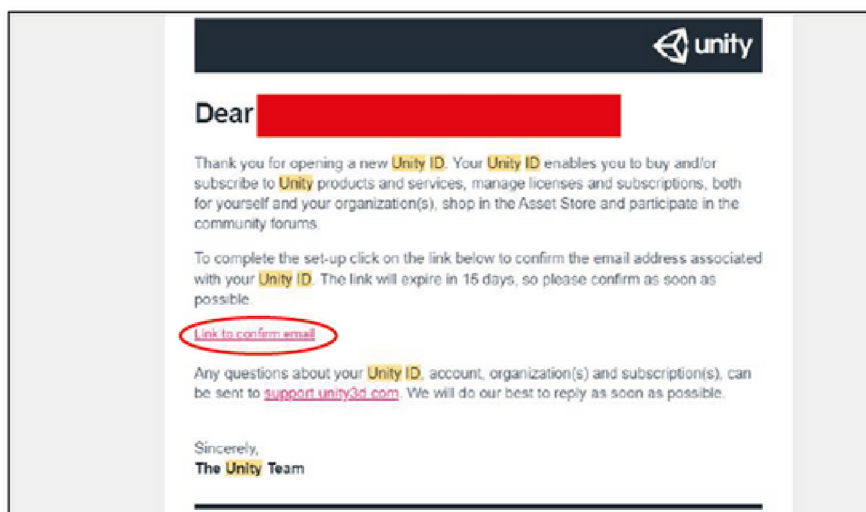
I acknowledge the [Unity Privacy Policy](#) (Republic of Korea Residents agree to the [Unity Collection and Use of Personal Information](#))(required).

I agree to have [Marketing Activities](#) directed to me by and receive marketing and promotional information from Unity, including via email and social media(optional).

Create Unity ID

OR

Step 7: We are almost done, you just have to confirm your email to validate your new Unity account. Remember, it is absolutely free. You will receive an email similar to the one in the image below, just make sure to click on the "link to confirm email" button and that's it, your new Unity account will be ready to use.

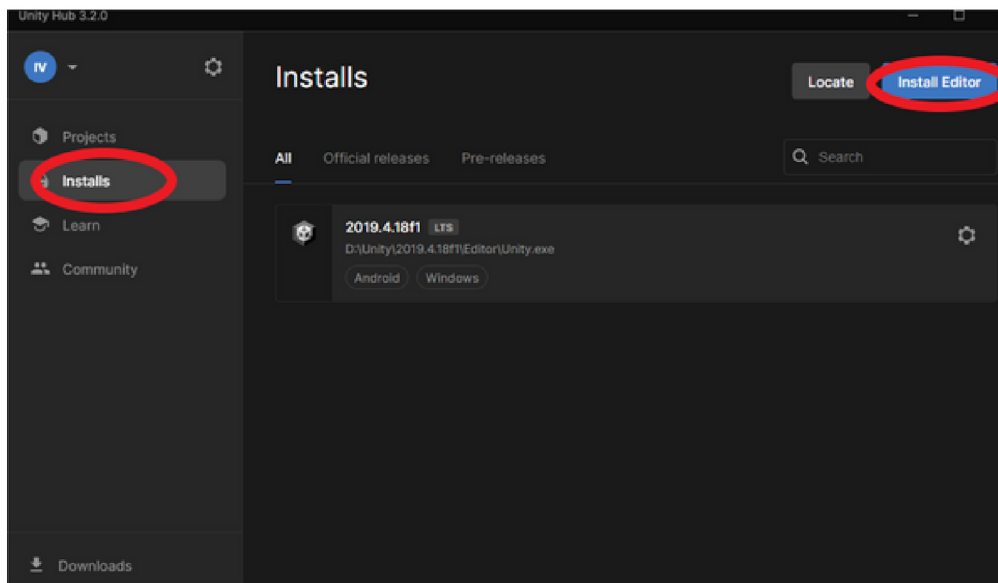


Step 8: Now your account has been created and you're ready to install Unity.

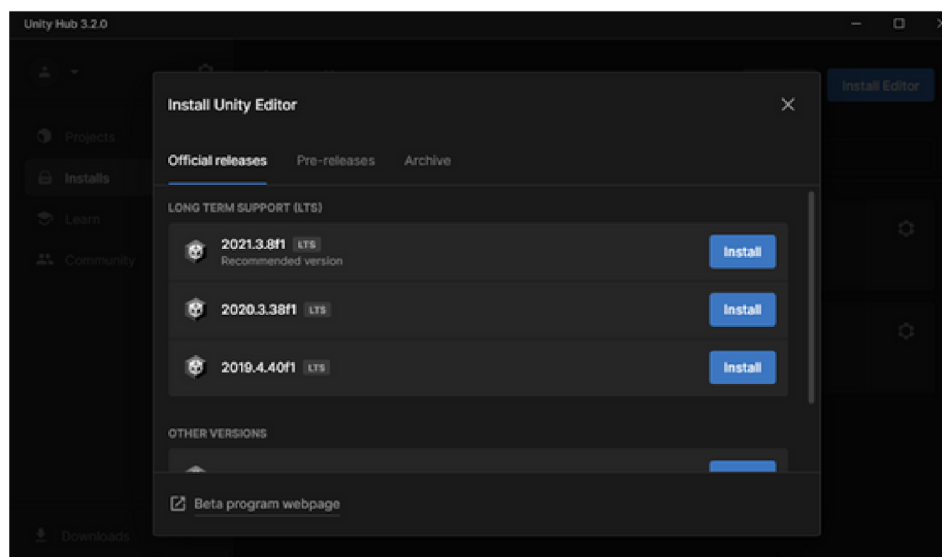
05

Installing Unity

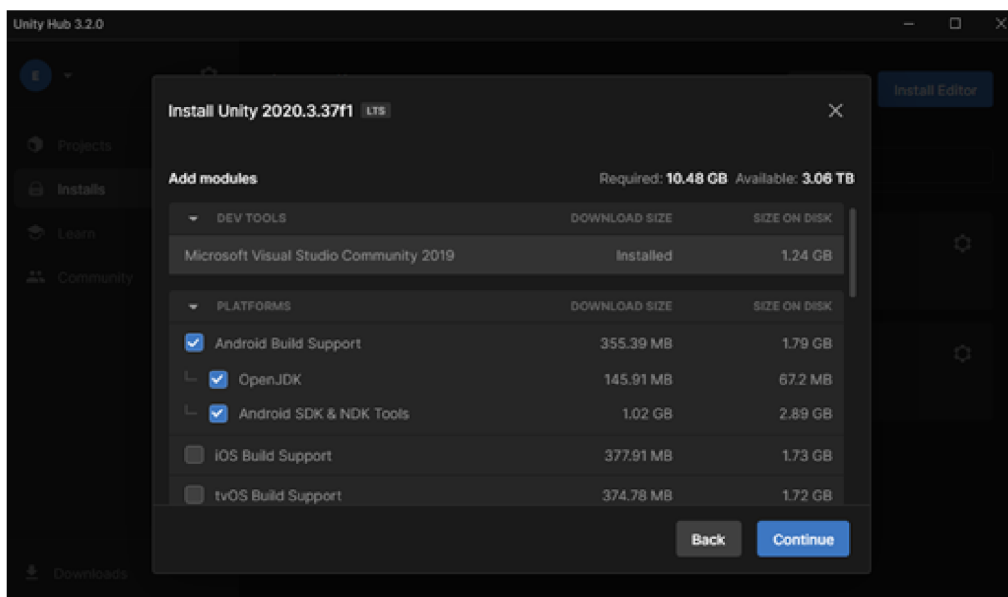
Step 9: Click on “installs”, after that click on “Install Editor”. The first part of the installation process involves downloading a version of Unity, during this tutorial, it is recommended to install the Unity 2020.3.37f1 (LTS) version, choose this option and then click on “Next”



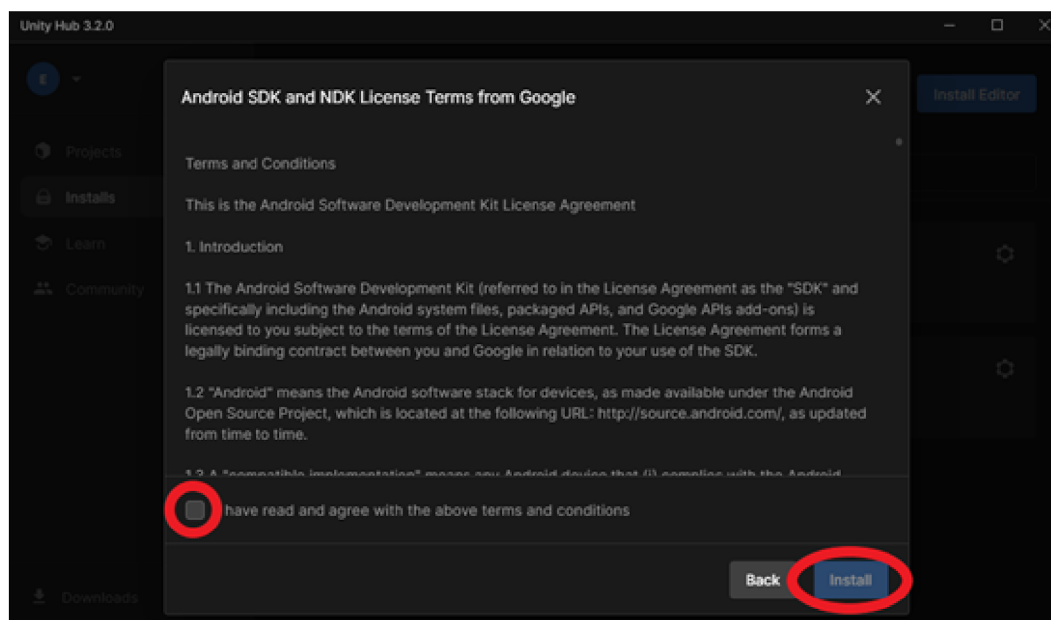
Step 10: You must choose which modules you will add to your Unity 2020.3.38f1 or Unity 2020.3.37f1 installation. If there is a newer version of the 2020.3.3Xf1 use that one. In this case make sure you select “Microsoft Visual Studio Community 2019 and Android Build Support, OpenJDK and Android SDK & NDK Tools. Click on the “Continue” button.



06



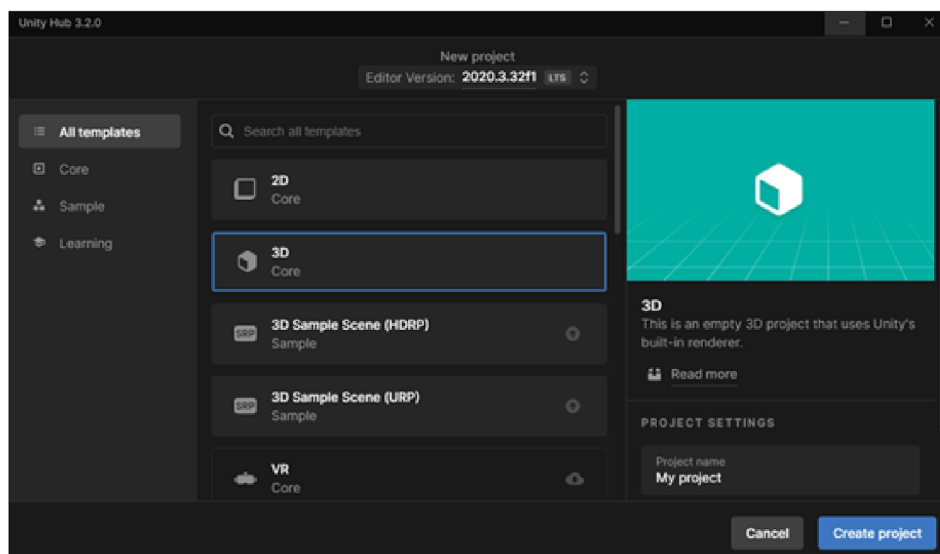
Step 11: You have to agree with Android's terms and conditions and then click on the "Install" button and wait some minutes until Unity has finished its installation process.



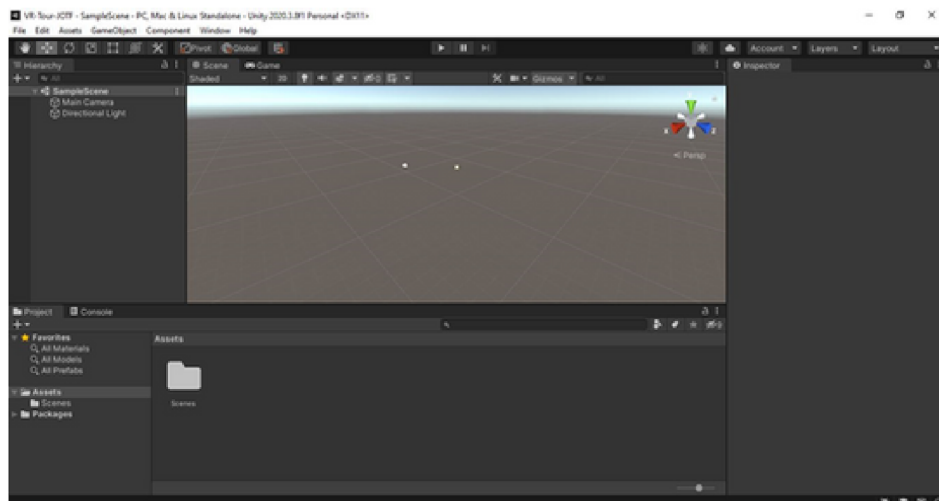
07

Creating the project

Step 12 : You must choose which type of project you will create. On the left side of the screen, you can choose from several templates which will help you configure your Workspace. Make sure “3D” is selected, then click on the “Create project” button and wait until Unity opens. When creating make sure that the correct version is selected.



Step 13: Now that you are inside Unity you should see a screen like this one. This is your workplace. By default, the lower window will have selected the “Assets” folder, and the only folder inside the Assets folder is the “Scenes” folder.

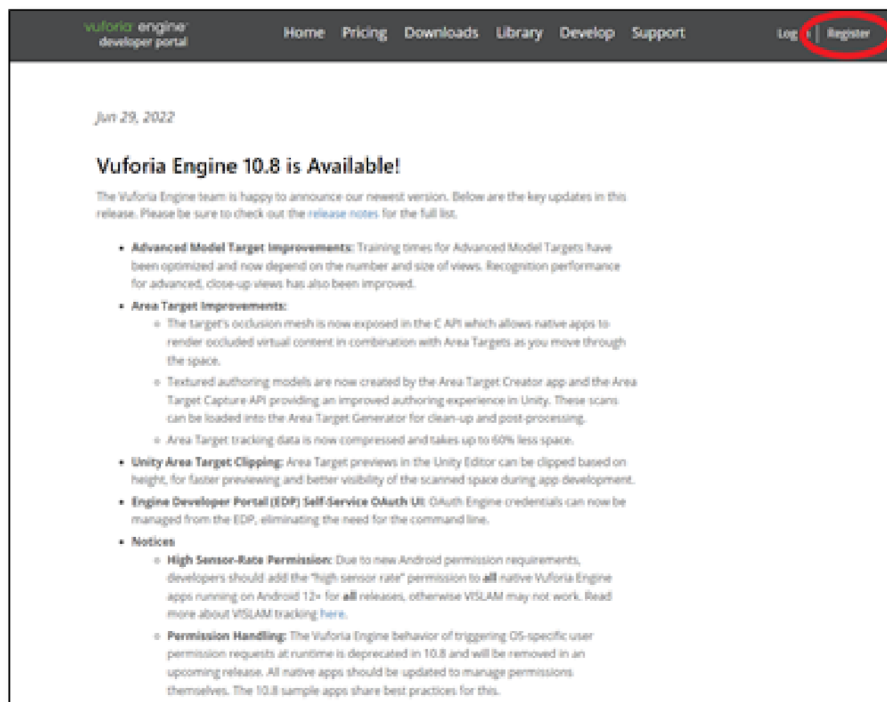


08



Vuforia

Step 14: Go to <https://developer.vuforia.com/> and click “Register” on the right top corner.

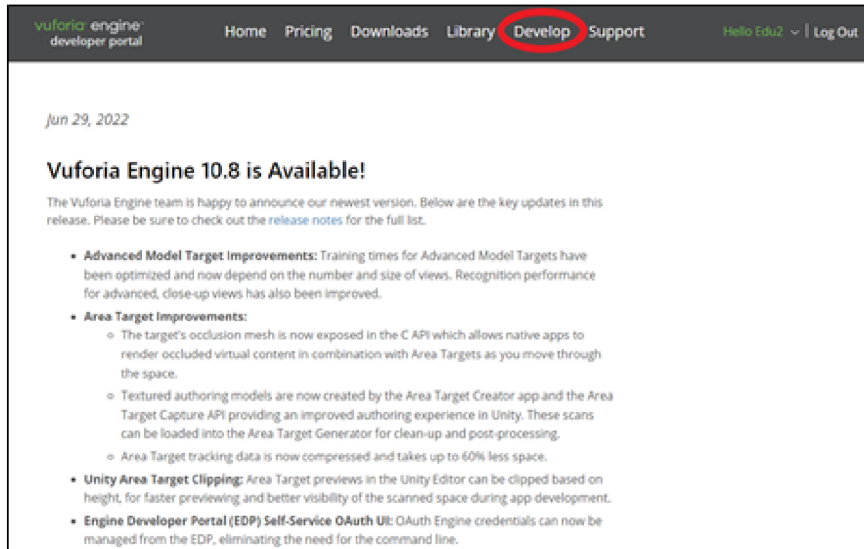


Step 15: Fill in the needed info. In company place you can type “None”. After filling the info click on “Create Account”.

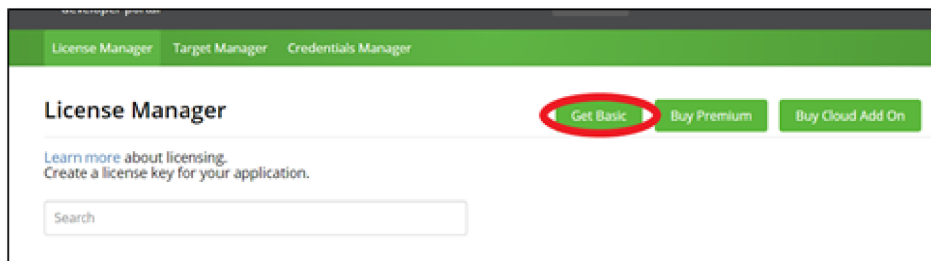
09



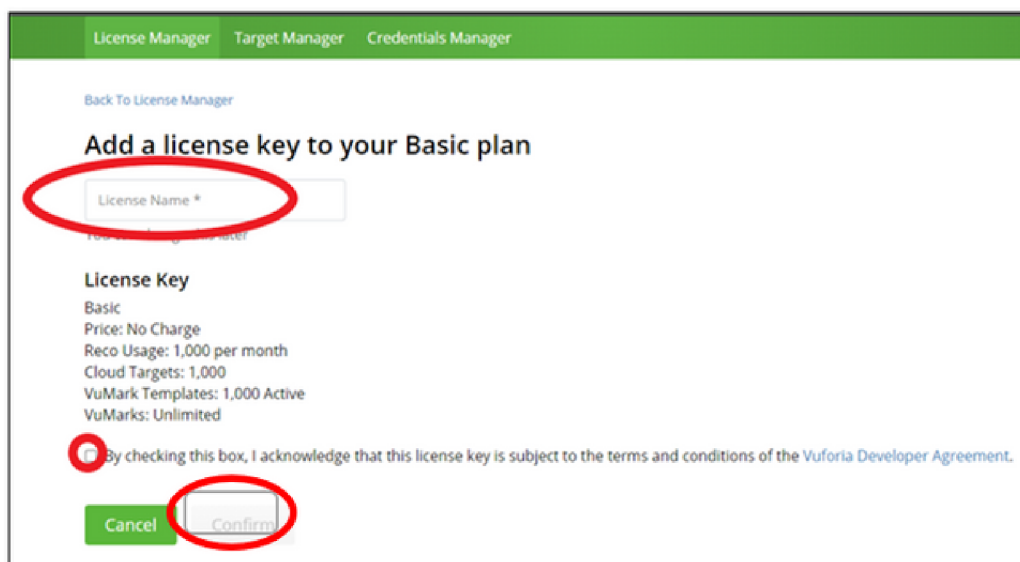
Step 16: After Logging in, click on “Develop”.



Step 17: Click on “Get Basic” in the license manager.

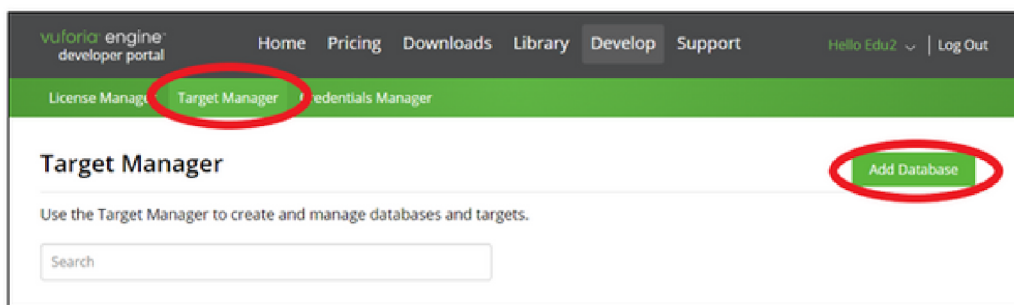


Step 18: Give your License any name and agree. Then click “Confirm”.

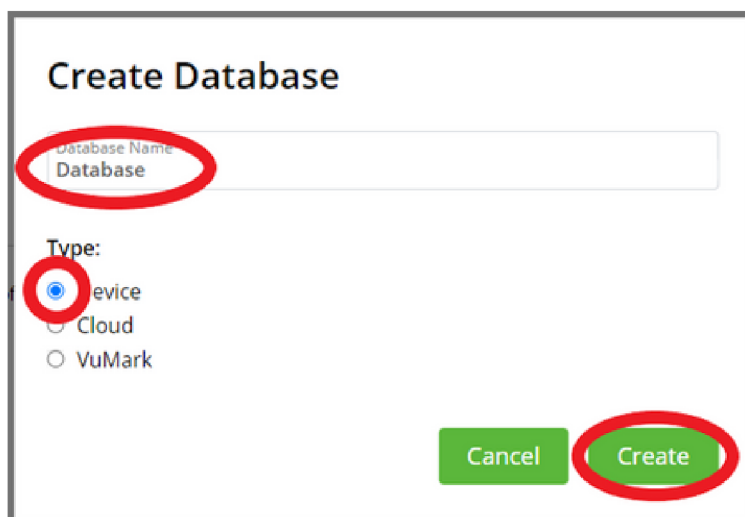


10

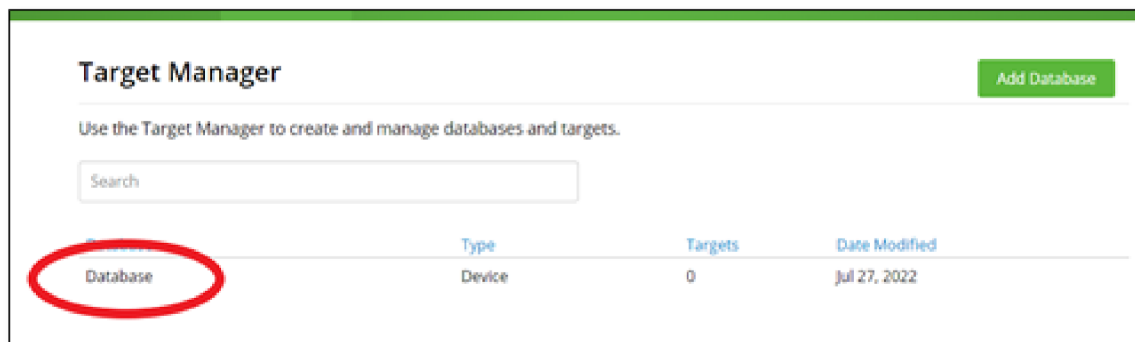
Step 19: Click on “Target Manager” and then on “Add database”.



Step 20: Name your database. Select the type “Device” and then click “Create”.

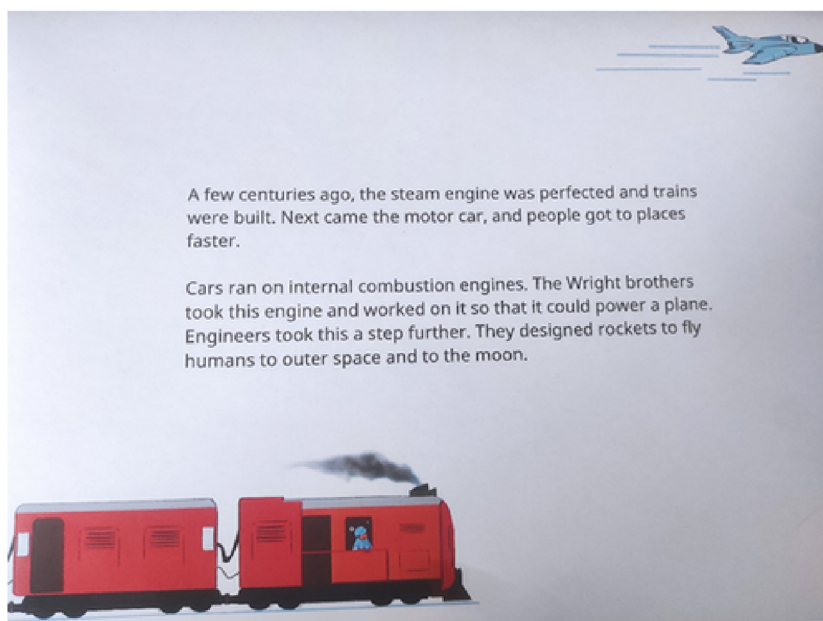


Step 21: Give your License any name and agree. Then click “Confirm”.



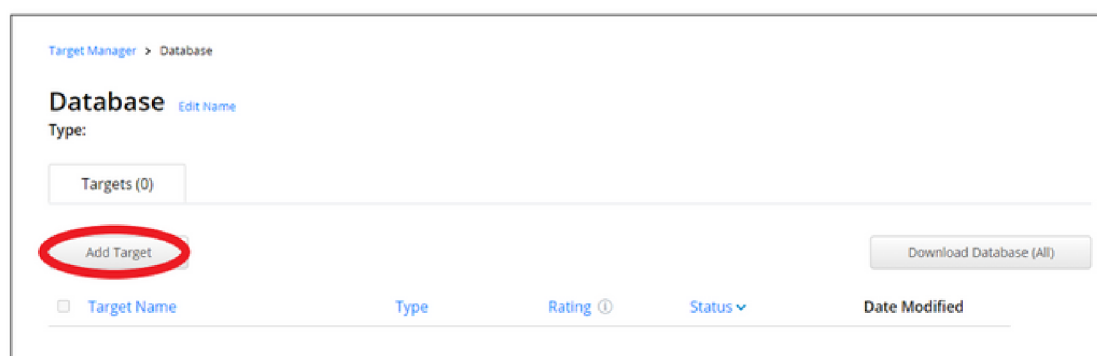
11

Step 22: Take a photo from a book of your choice. Make sure to include only the page in the picture. You can get this book from this link: http://freekidsbooks.org/wp-content/uploads/2021/08/whoopee-hyperloop-pratham_FKB.pdf . Here is a example:



Step 23: The pictures need to be under 2mb, if the image is over 2mb you need to use this image compressor: <https://imageresizer.com/image-compressor>

Step 24: Click on “Add target”.



12

Step 25: Select your compressed image, set the Type to “Image”, set width to “6” and Name your image. After that click on “Add”.

Add Target

Type

Image Multi Cylinder Object

File:

IMG_20220727_174826.jpeg Browse...

.jpg or .png (max file 2mb)

Width:

6

Enter the width of your target in scene units. The size of the target should be on the same scale as your augmented virtual content. Vuforia uses meters as the default unit scale. The target's height will be calculated when you upload your image.

Name:

Page 4

Name must be unique to a database. When a target is detected in your application, this name will be reported in the API.

Cancel Add

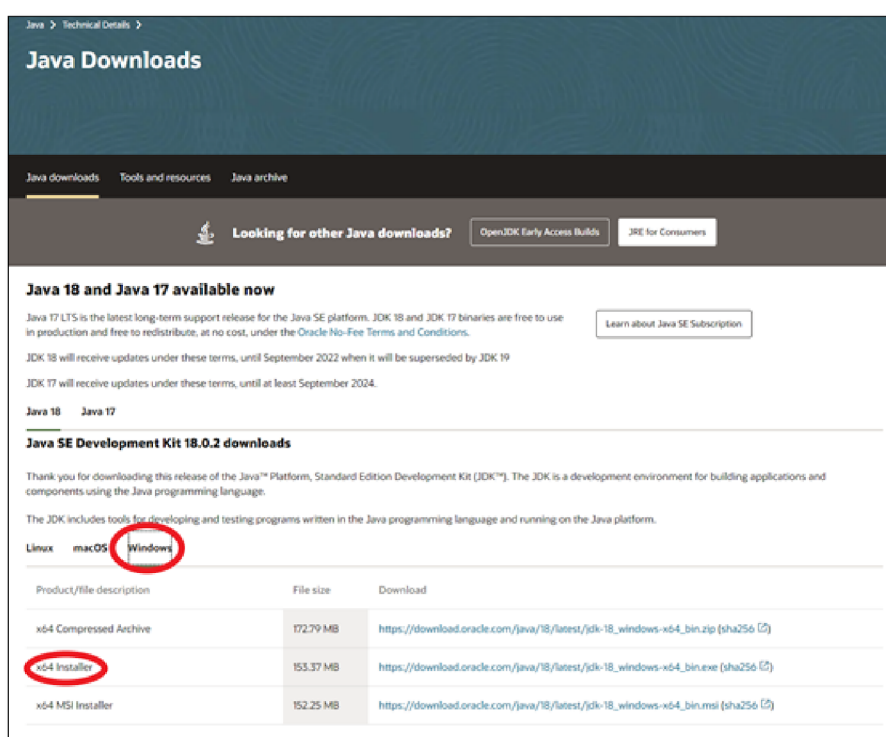
Step 26: Wait while the picture is being processed, this should not take long.

Targets (1)					
Add Target				Download Database (All)	
<input type="checkbox"/>	Target Name	Type	Rating ⓘ	Status ▼	Date Modified
<input type="checkbox"/>	Page-4	Image	★★★★★	Processing	Jul 28, 2022 20:33

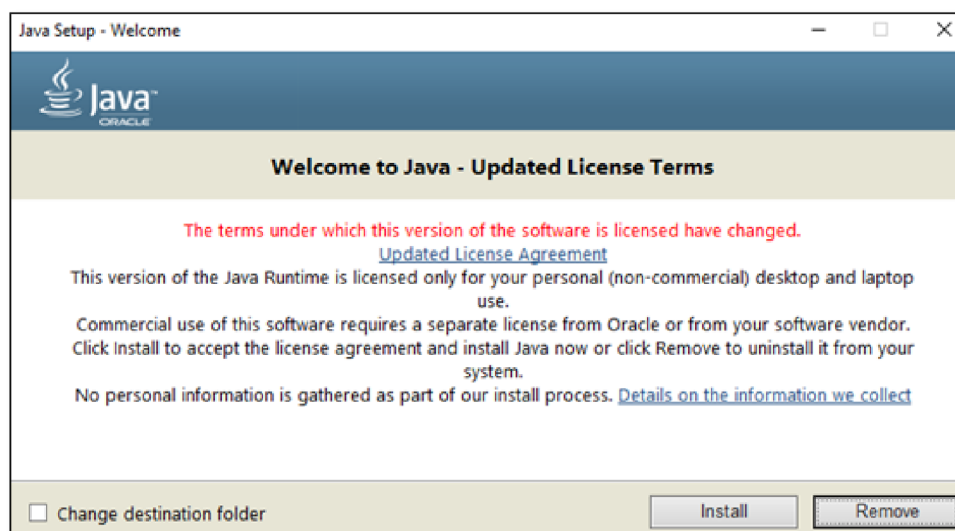
13

Installing Java SDK & JRE

Step 27: We will need to instal java JDK and JRE, you can install them from here: Java Downloads | Oracle To download java JDK. To install it choose your operating system and then click on x64 installer.

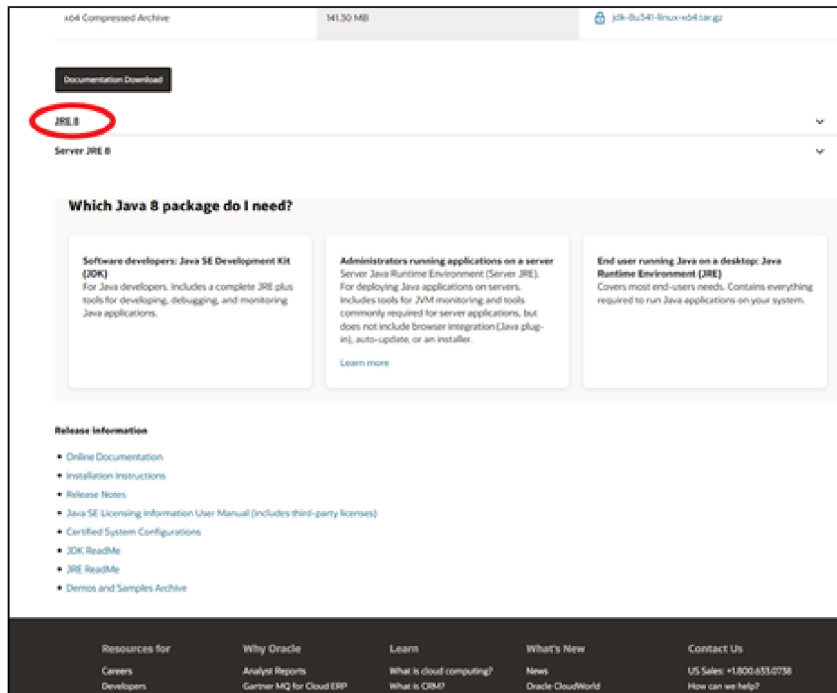


Step 28: Download the file and then click on it to start the installation. When the installation is started click on “Install”.

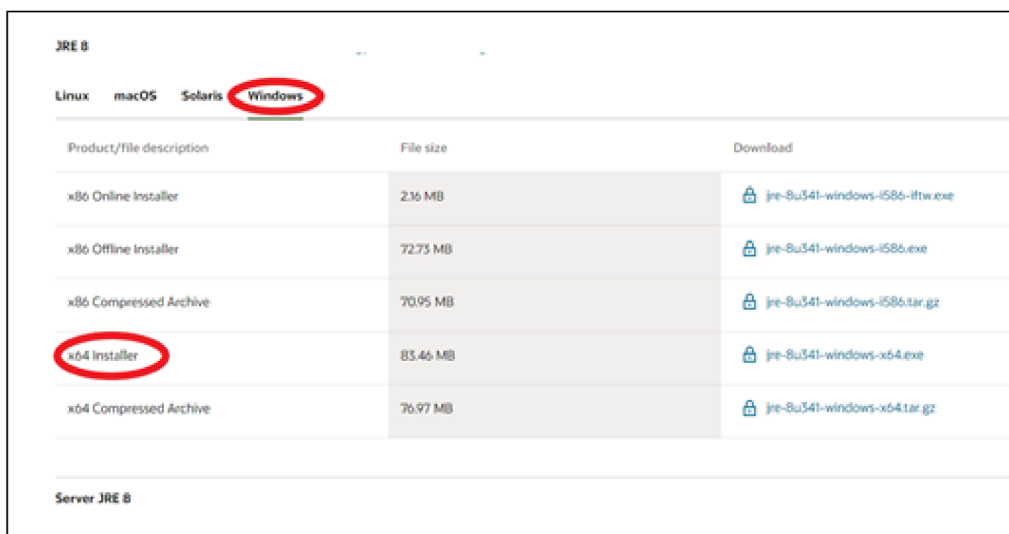


14

Step 29: To install java JRE, scroll to the bottom of the page and then you should see “JRE 8”, click on it.

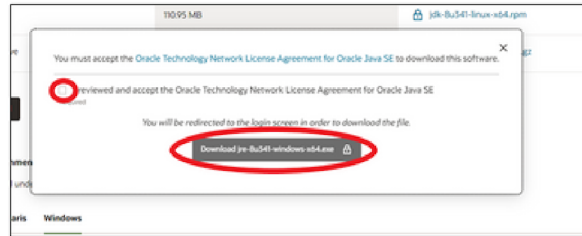


Step 30: Choose your operating system and then download x64 installer. To install Java JRE you need to register to Oracle.

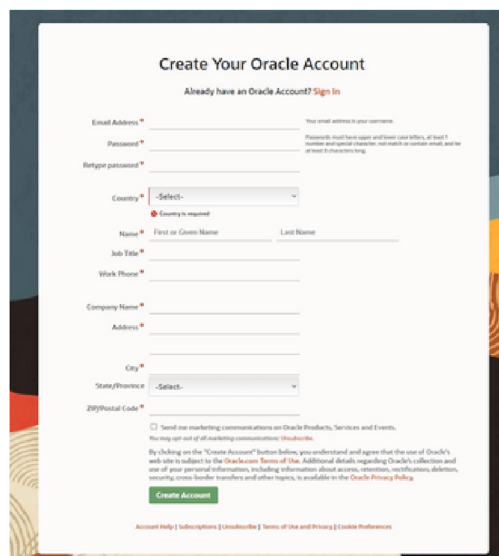
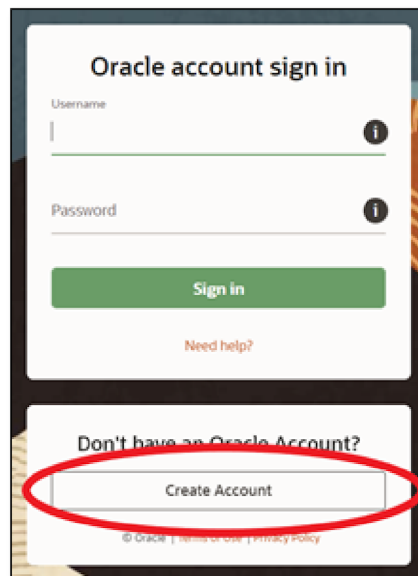


15

Step 31: After clicking on Dowload you should see something like this, check the little square and then click on download.



Step 32: Click on “Create Account” if you dont have an Oracle Account yet

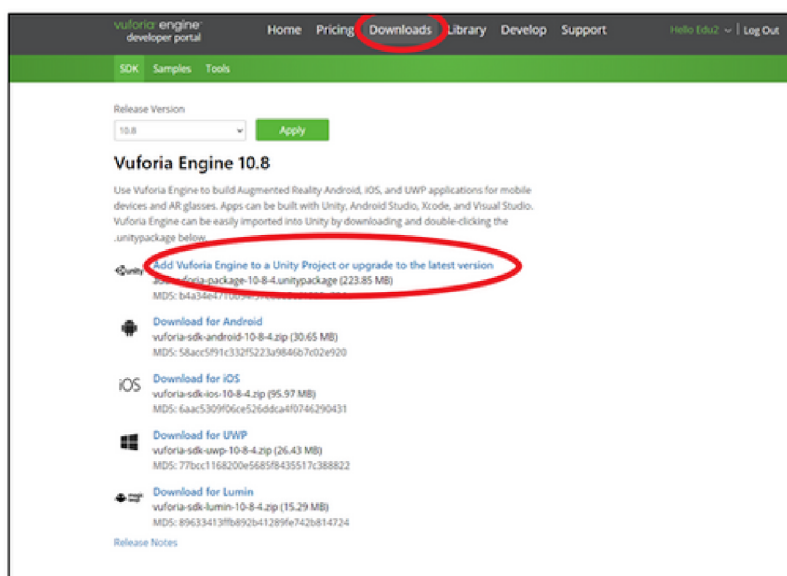


16

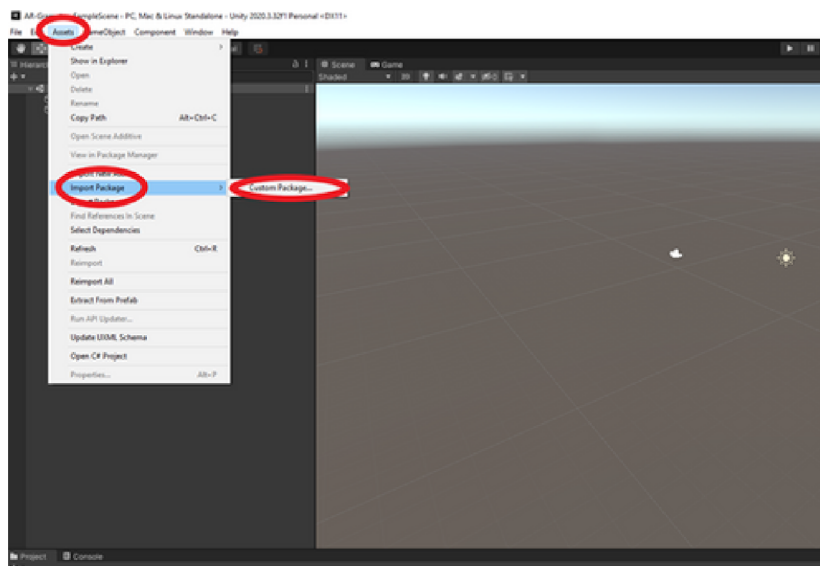
Step 34: After registering you can download the file and install this. Installation will be pretty much the same as Java SDK (You might need to redo Step 31 if after registering it doesn't start downloading)

Downloading Vuforia for Unity

Step 35: Go back to Vuforia and click on "Downloads" and download Vuforia for Unity



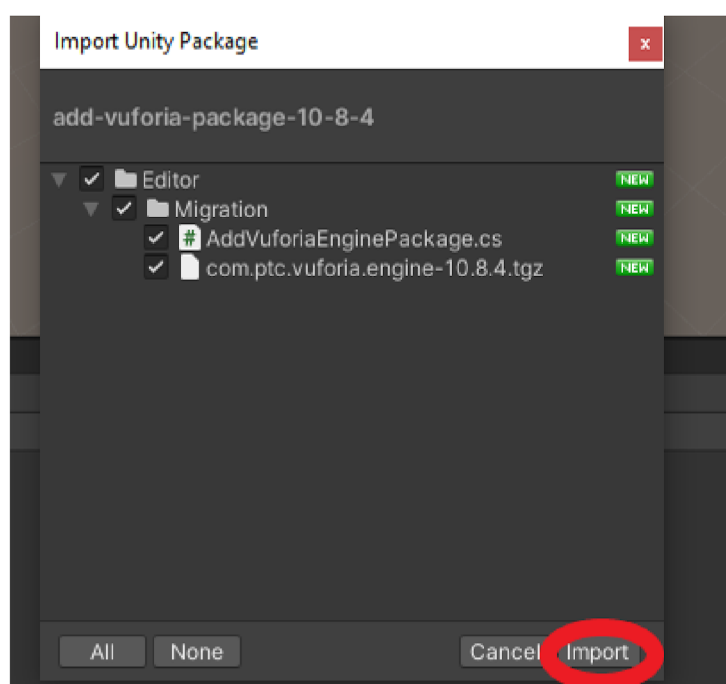
Step 36: Go back into Unity and hover over "Assets" on the left top corner. After hover over "Import Package" and then click on "Custom Package".



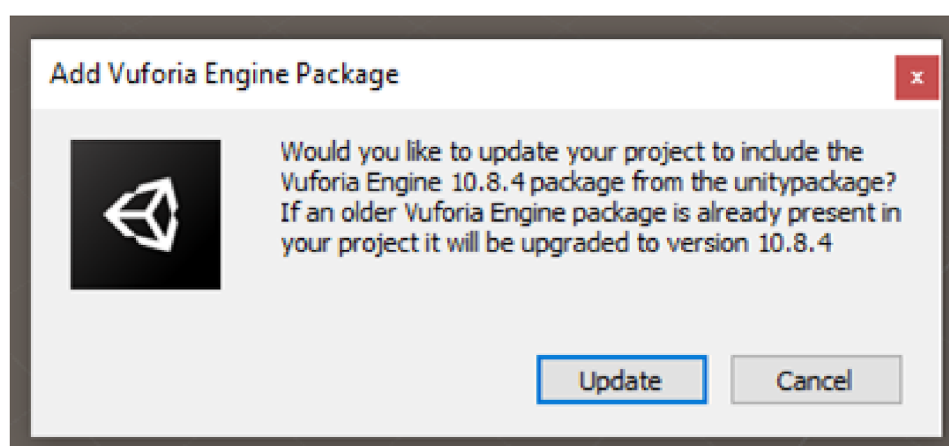
17

Step 37: Find the file downloaded from Vuforia and then click on it to add it.

Step 38: After you've done that a new window should pop up. Click on "Import"

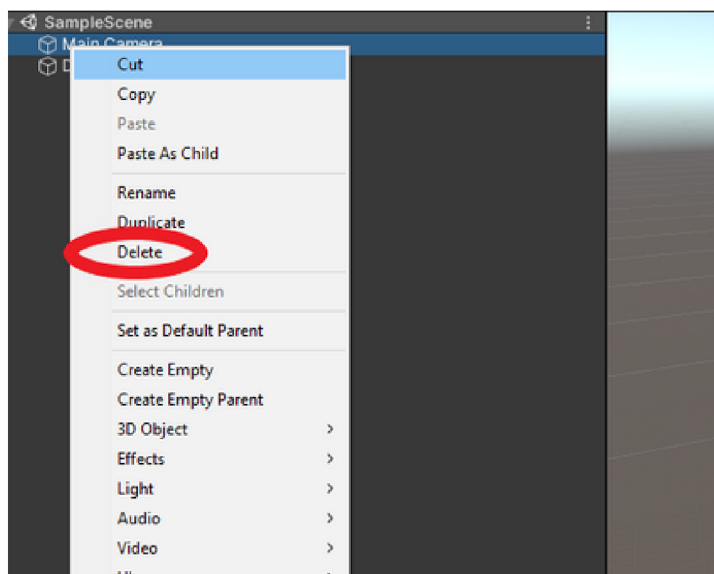


Step 39: There should be another pop up window. Click on "Update" and the Unity project will restart.

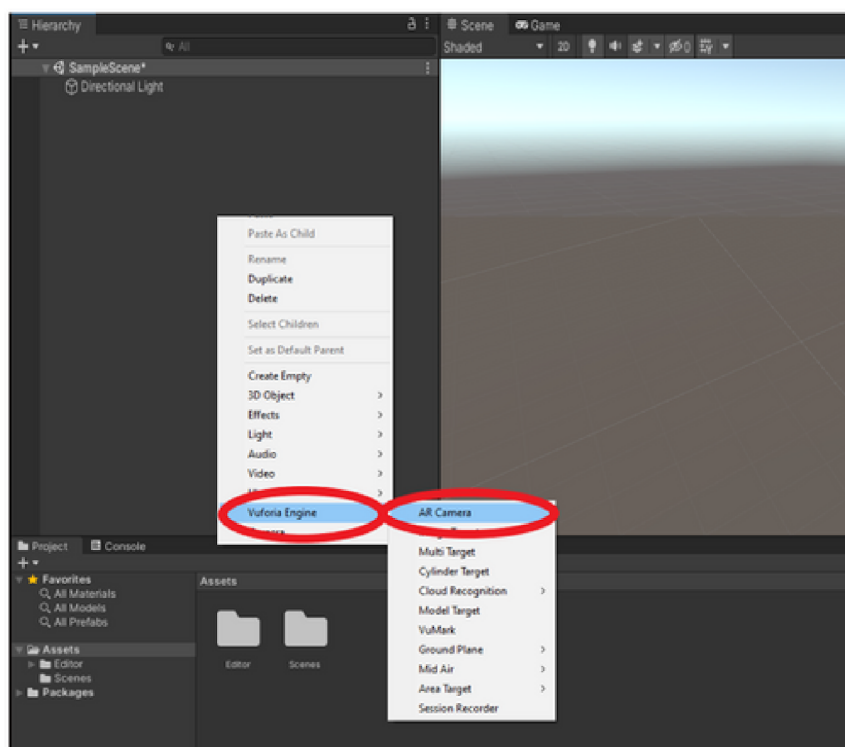


18

Step 40: Delete the main camera by right clicking on it and pressing “delete”

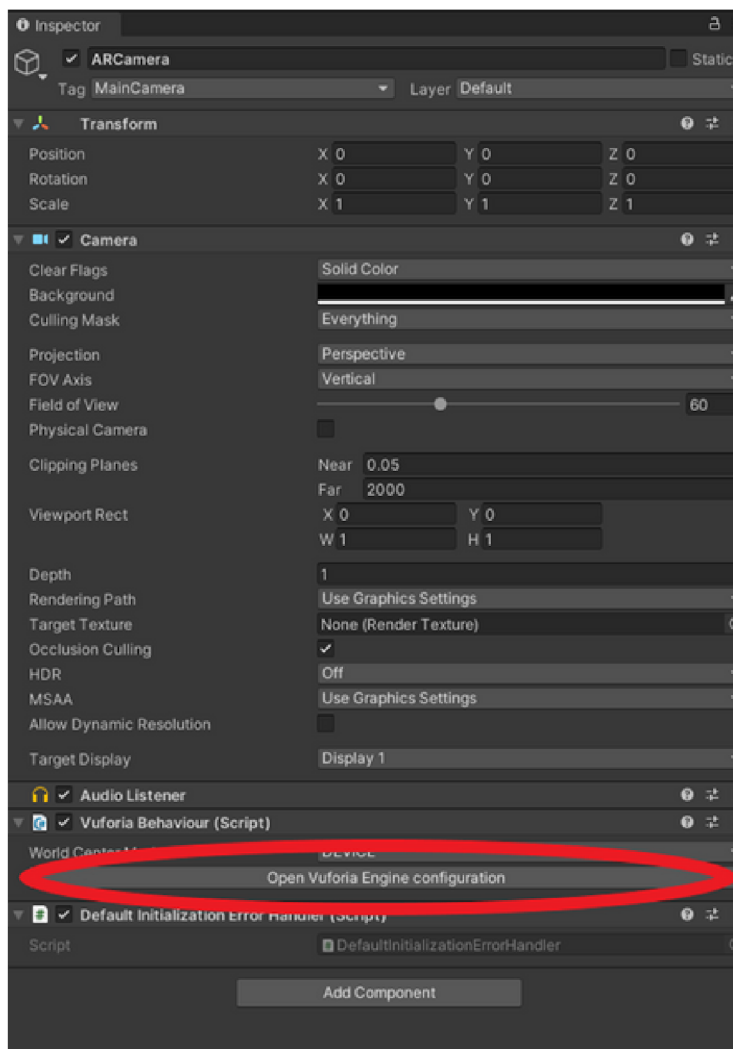


Step 41: Add an AR camera by right clicking anywhere on the Hierarchy field, then hover over “Vuforia Engine” and press “Ar Camera”.

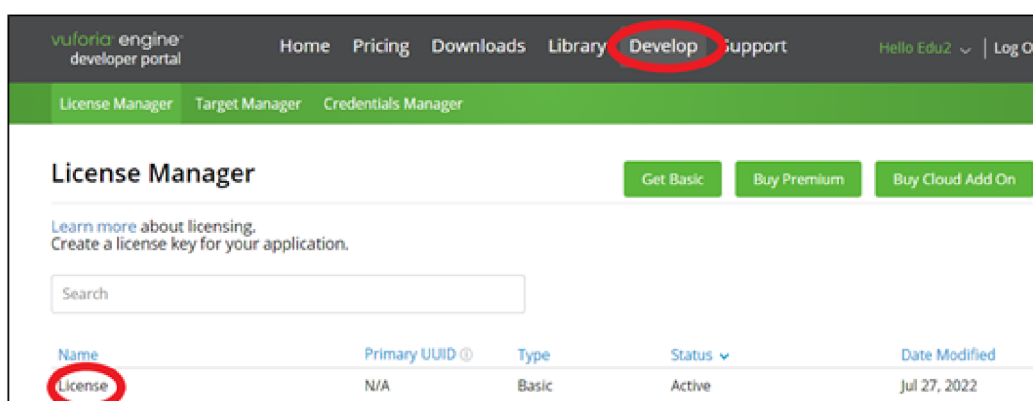


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Step 42: Click on “AR Camera” and a new window should open up. Click on “Open Vuforia Engine configuration”

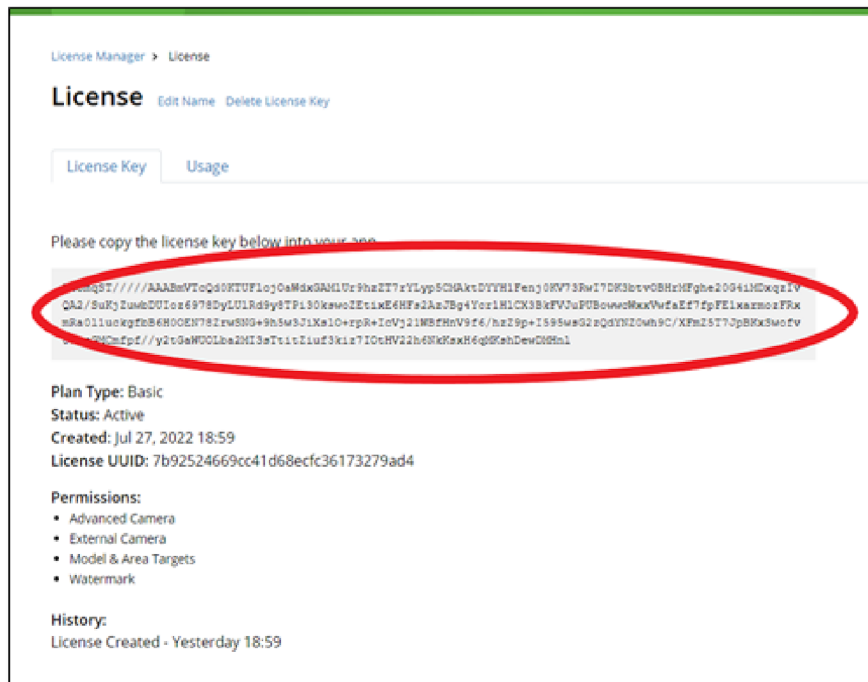


Step 43: Go back to Vuforia website and press on “Develop”, after that select your license.

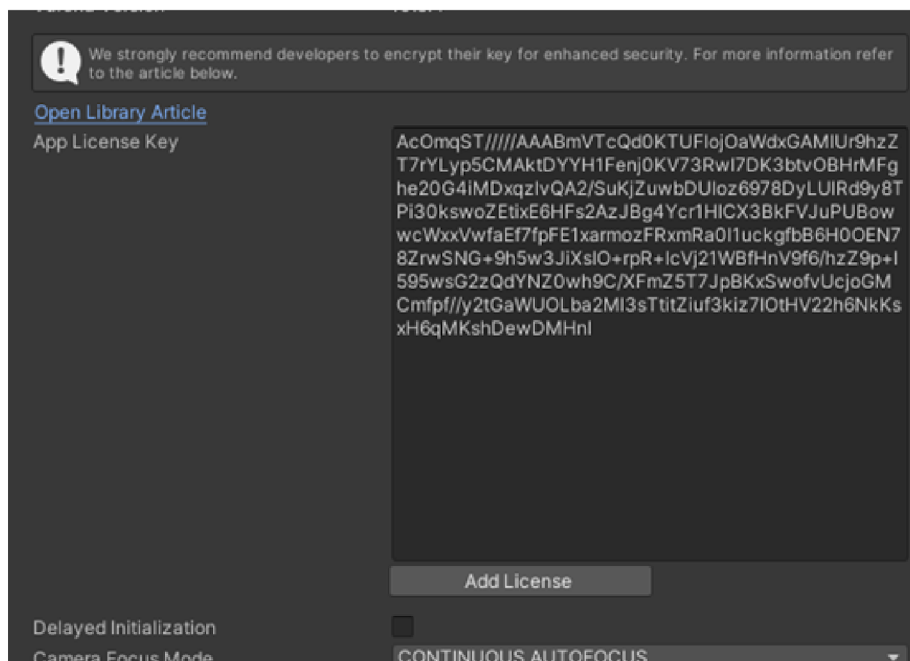


20

Step 44: Press on the license key to copy it.



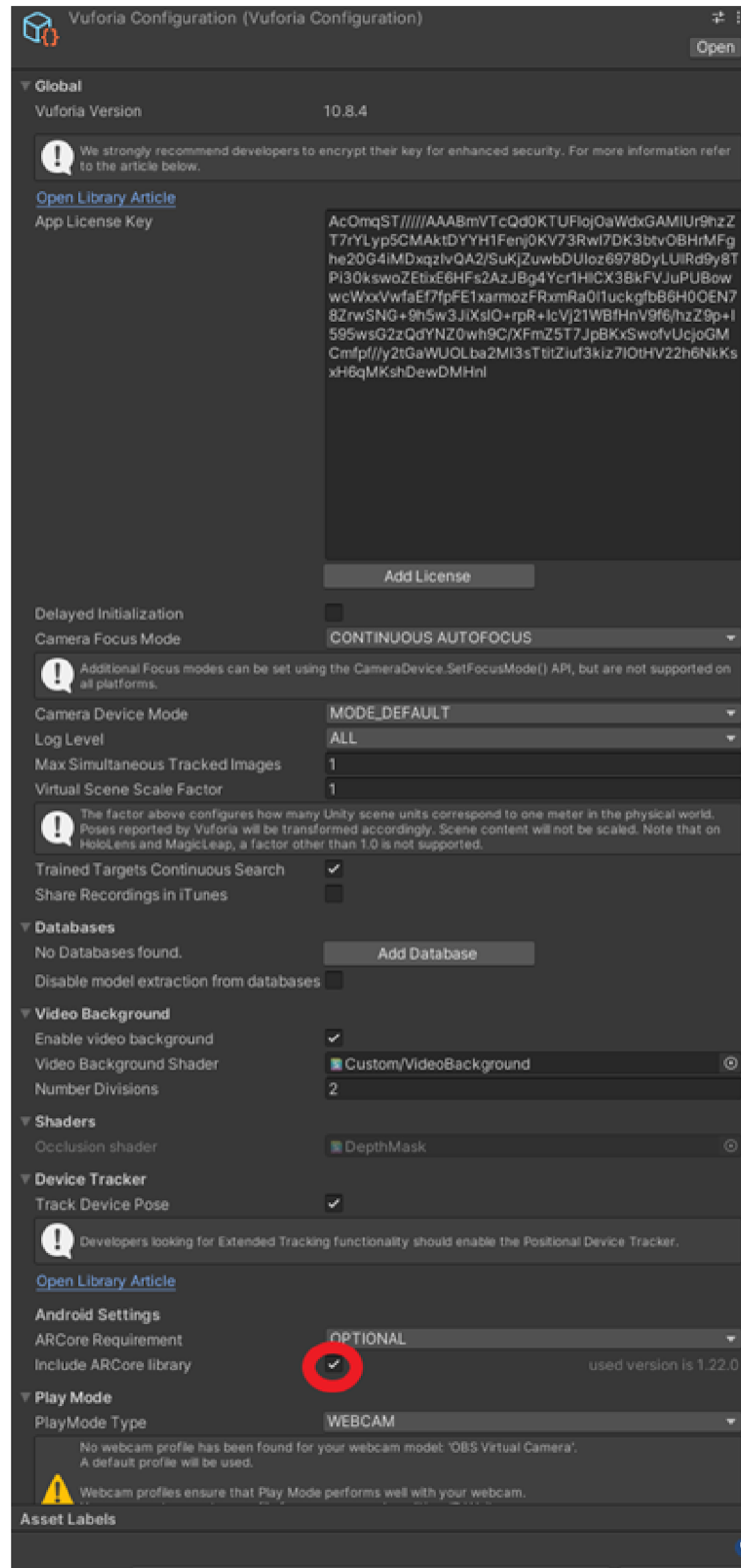
Step 45: Now go back in Unity and paste it in "App License Key" field.



21

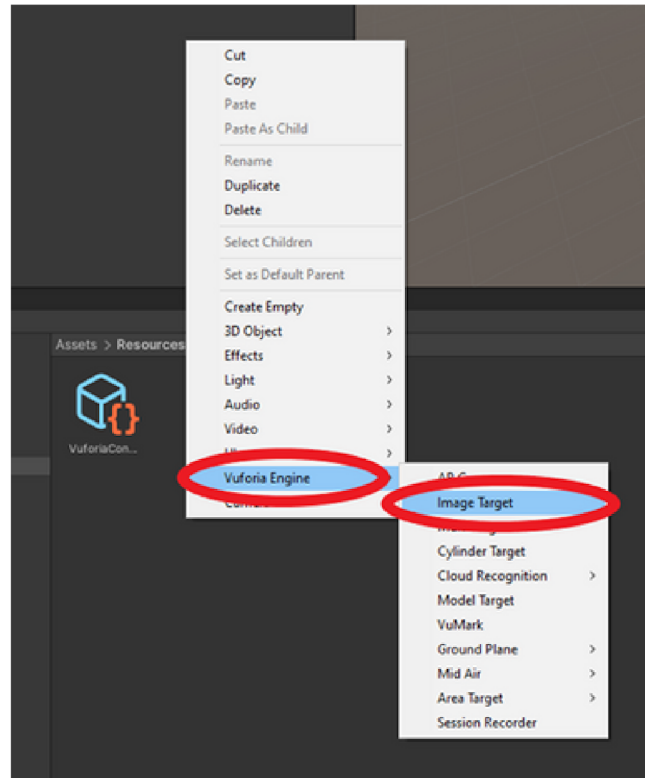


Step 46: Unthick "Include Arcore library"

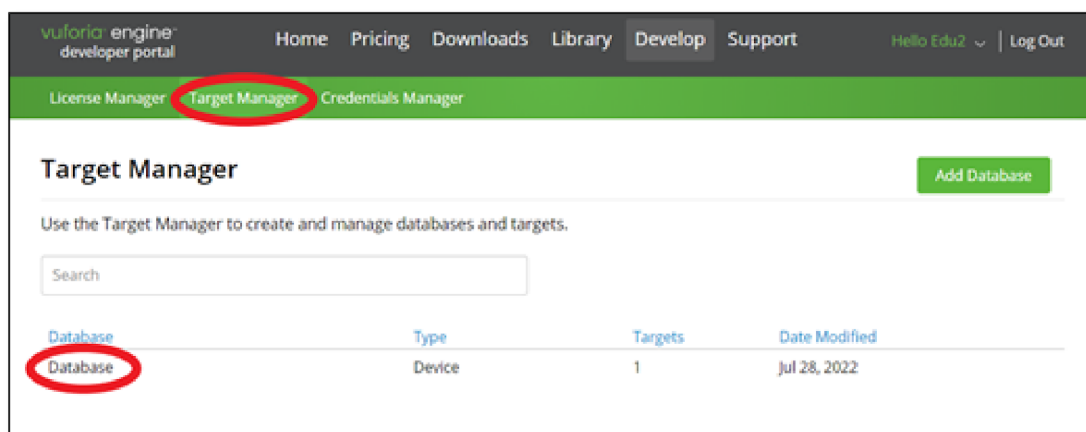


22

Step 47: Now go back to Unity and paste it in “App License Key” field.

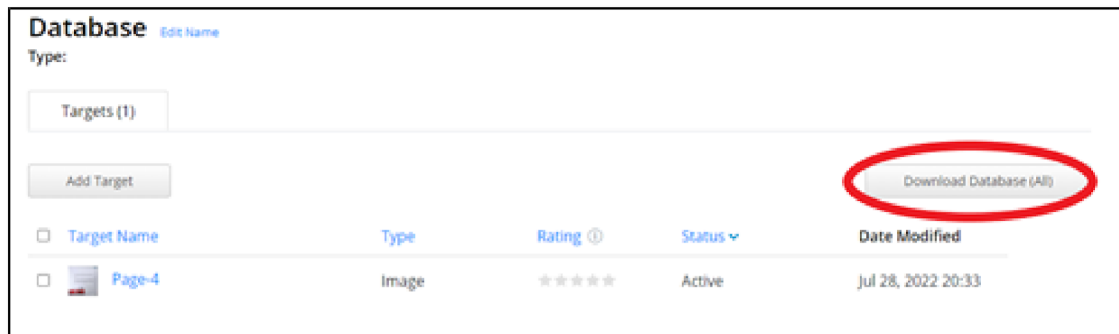


Step 48: Go back to Vuforia website and click on “Target Manager”, then Click on your Database

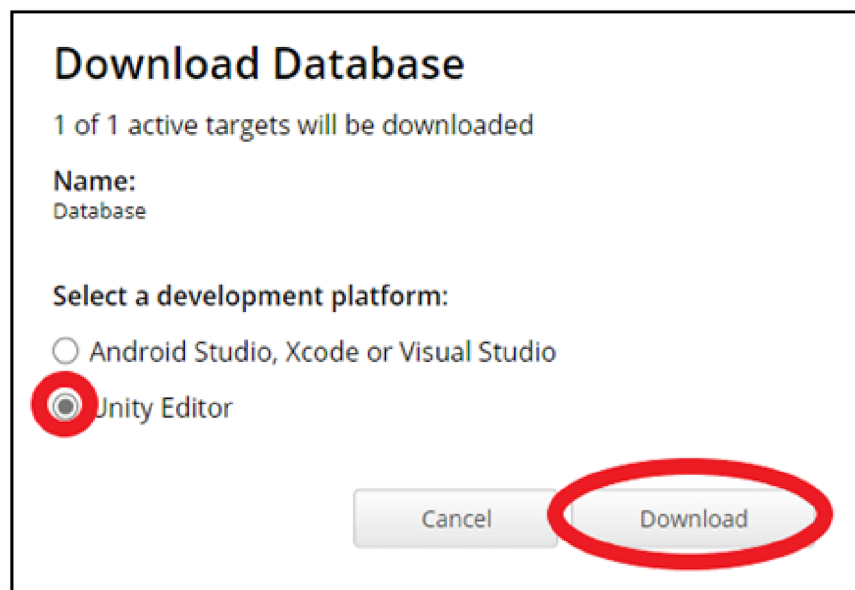


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Step 49: Press on “Download Database (All)”.



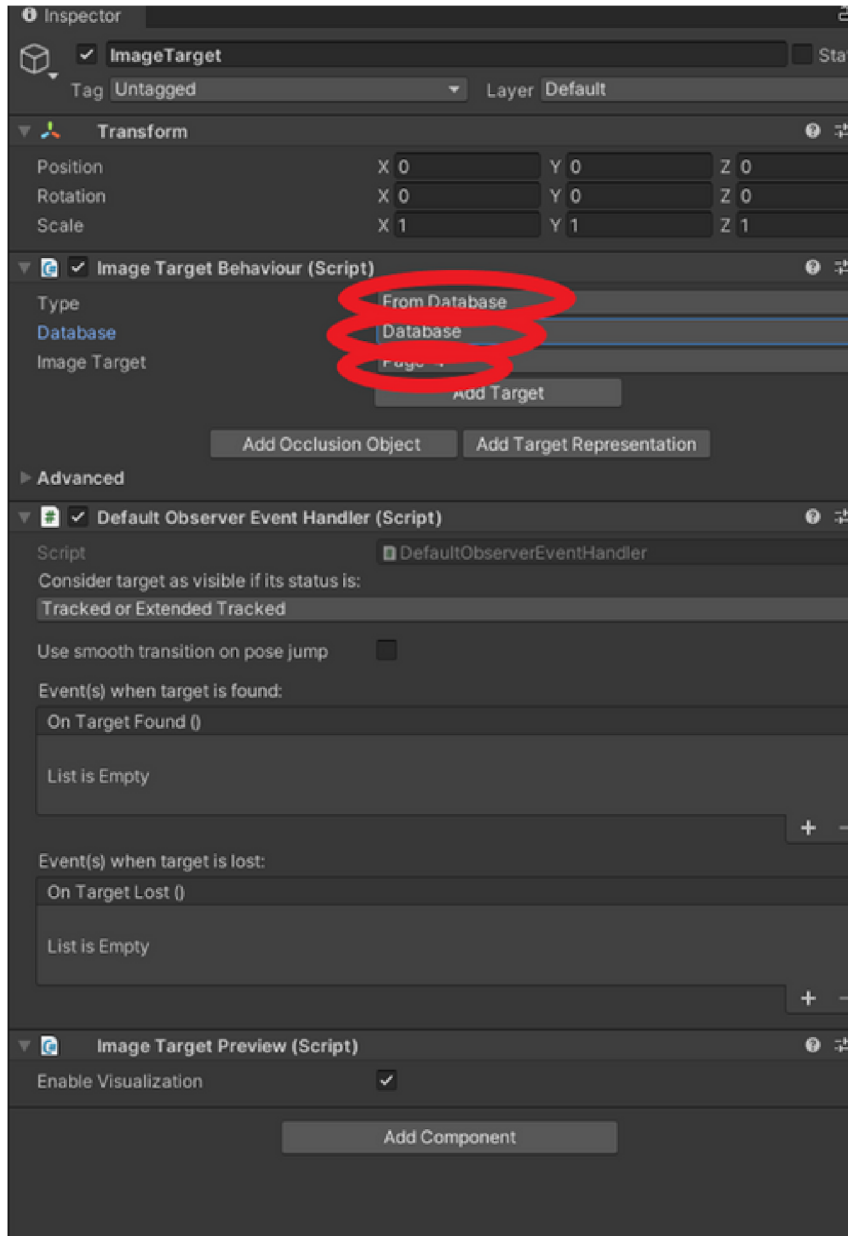
Step 50: Click on “Unity Editor” and then download it , this file will be used in the next step so save it in an accesible place.



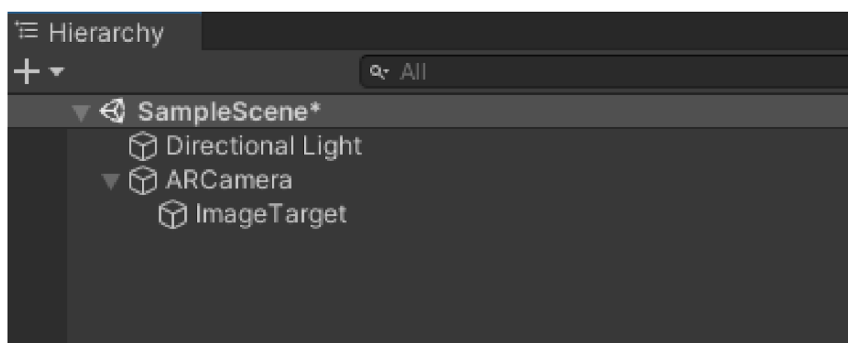
Step 51: Repeat Step 36 & 38, but this time with the file you downloaded in the last step.

Step 52: Left click on Image Target and on the right side in inspector in “Image Target Behaviour” set Type to “From Database” then Select the database and then select the image if its not already automatically selected.

24

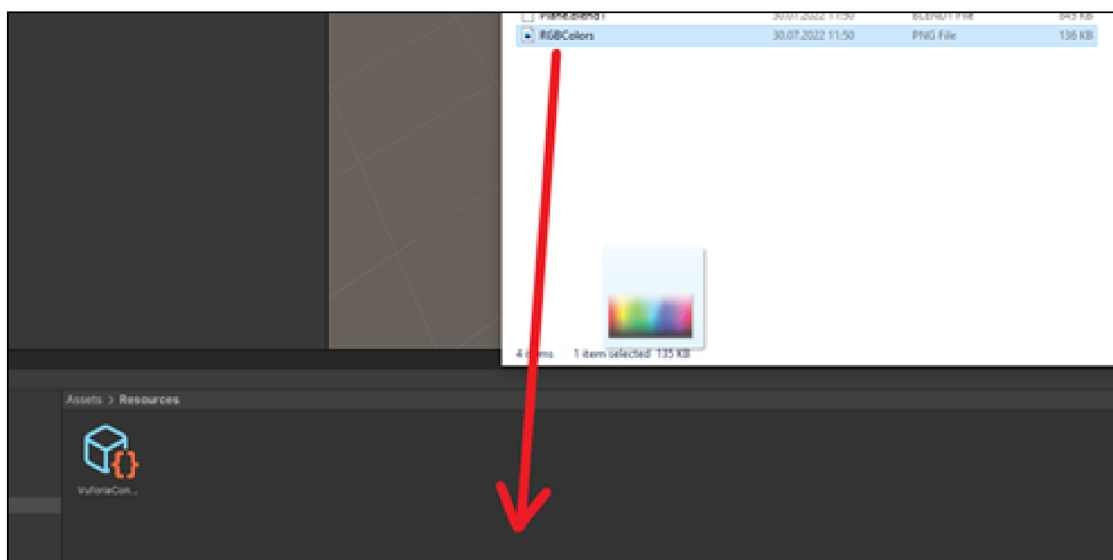


Step 53: Hold Left click on the Image target in Hierarchy and drag it under "ARCamera"

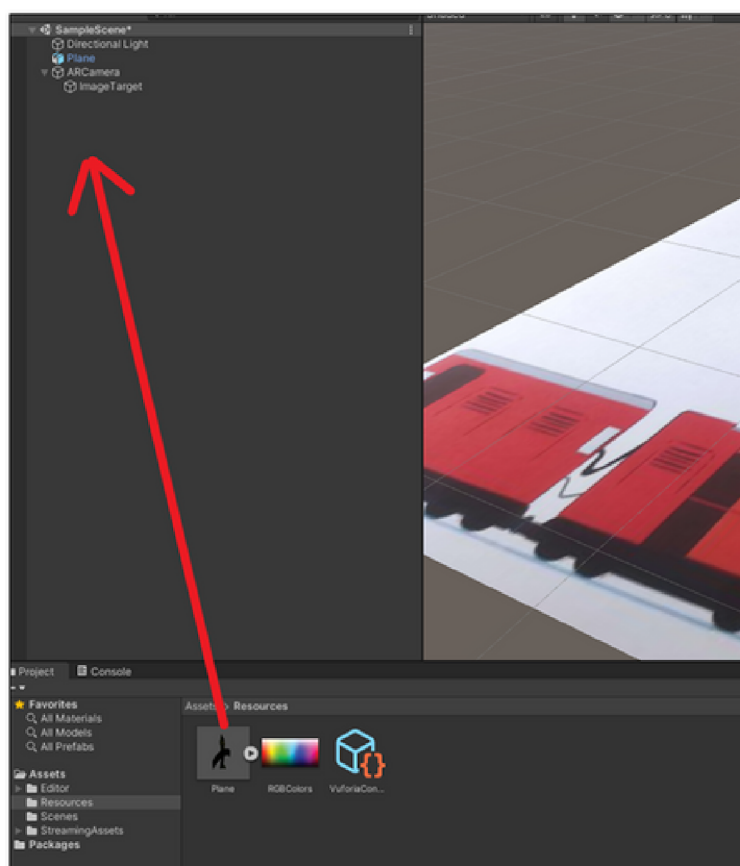


25

Step 54: Download the file “Plane.fbx” and “RGBColors.png”, then drag it in Unity.

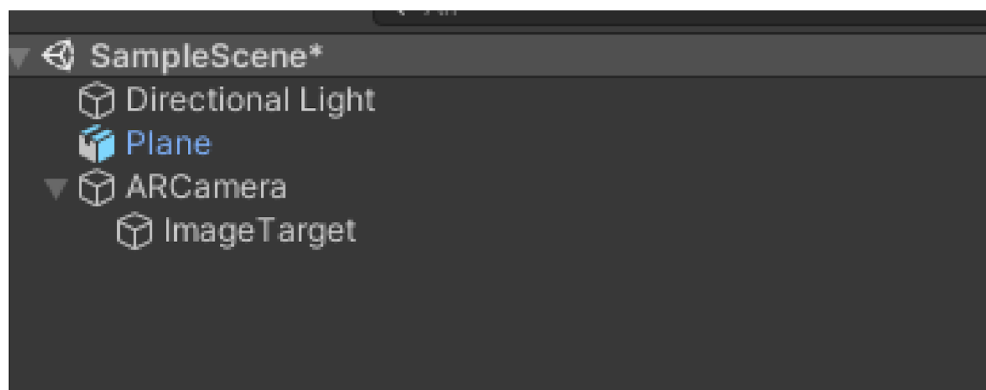


Step 55: Drag the model into hierarchy

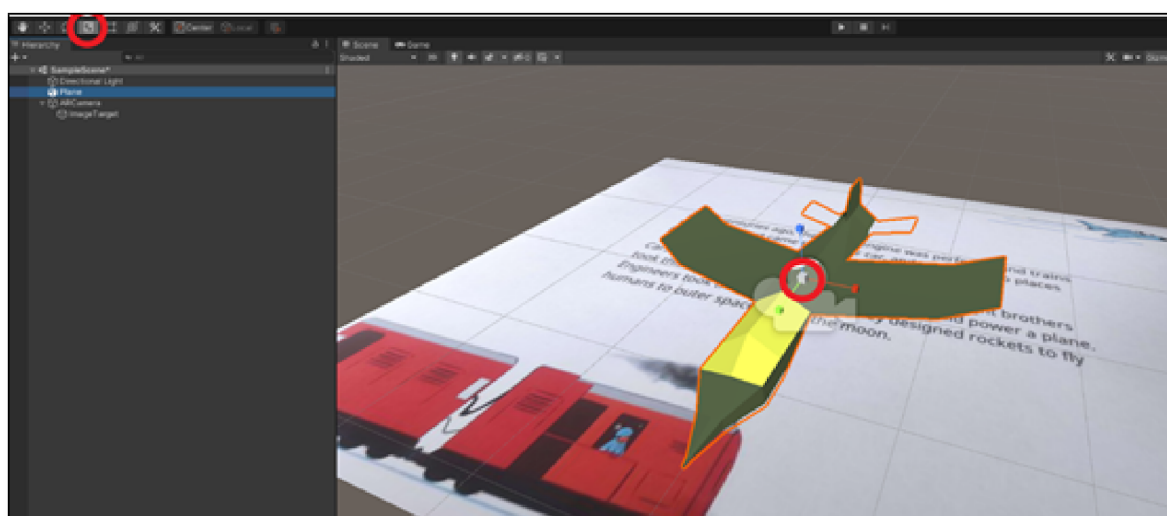


26

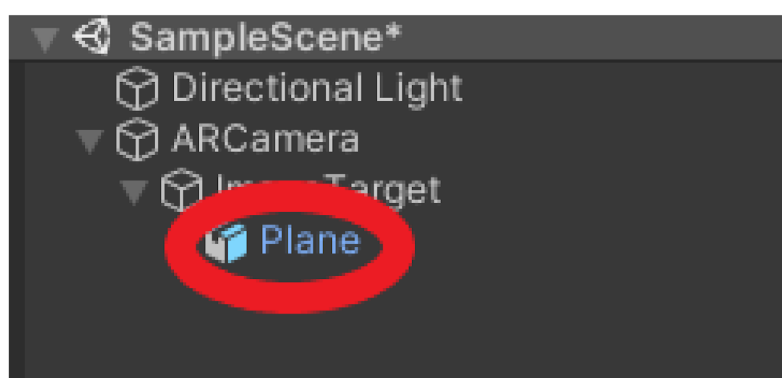
Step 56: The Hierarchy should look like this.



Step 57: Left click on the plane and using the “Scale tool” on the left top corner, scale the plane down by holding the white cube in middle.

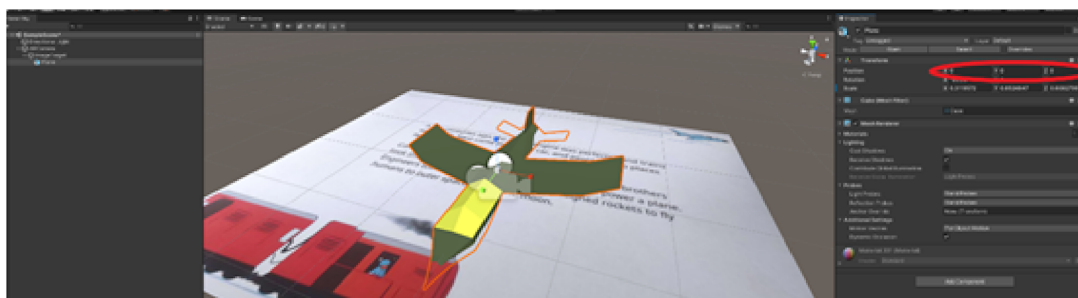


Step 58: Drag the Plane under “Image Target”

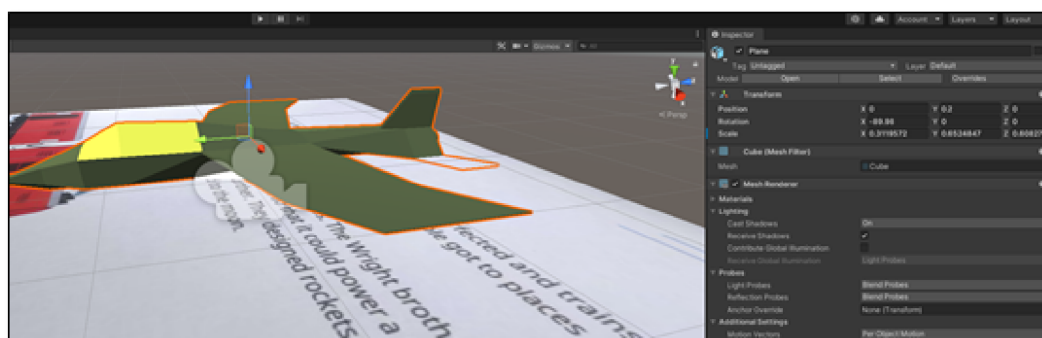


27

Step 59: Left click on the plane and on the right side of your screen a new window should pop up with info about the plane. Set the position to “0” on every axis.

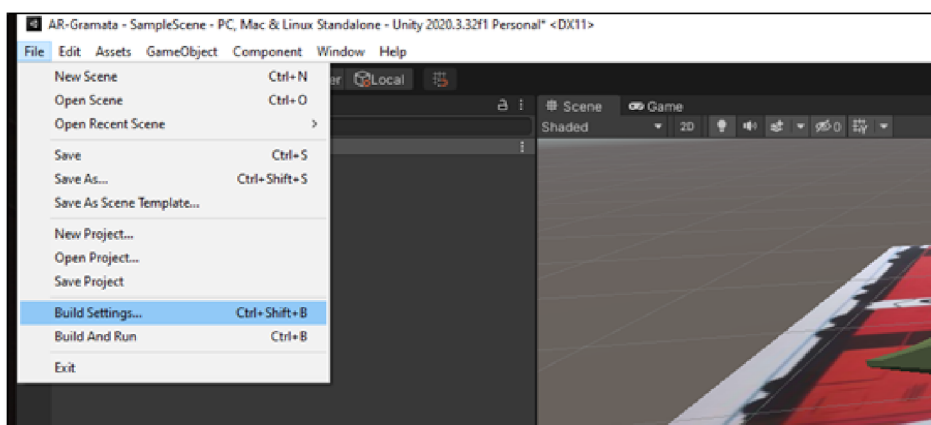


Step 60: Set the Y Position to “0.2”.



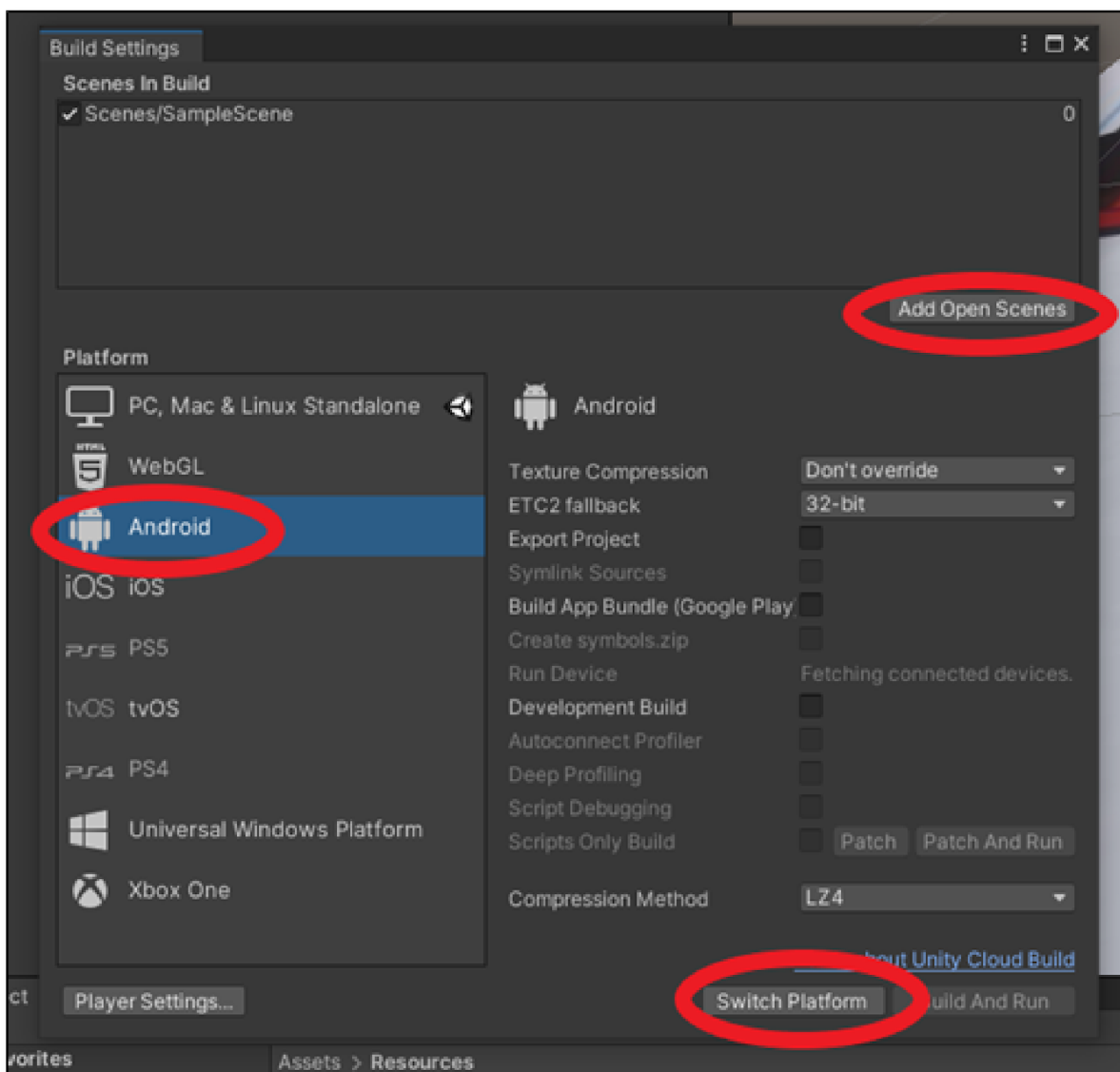
Step 61: Press Ctrl + S to save the project otherwise you can lose everything when building

Step 62: On the top left corner hover on “File” and then press on “Build Settings”



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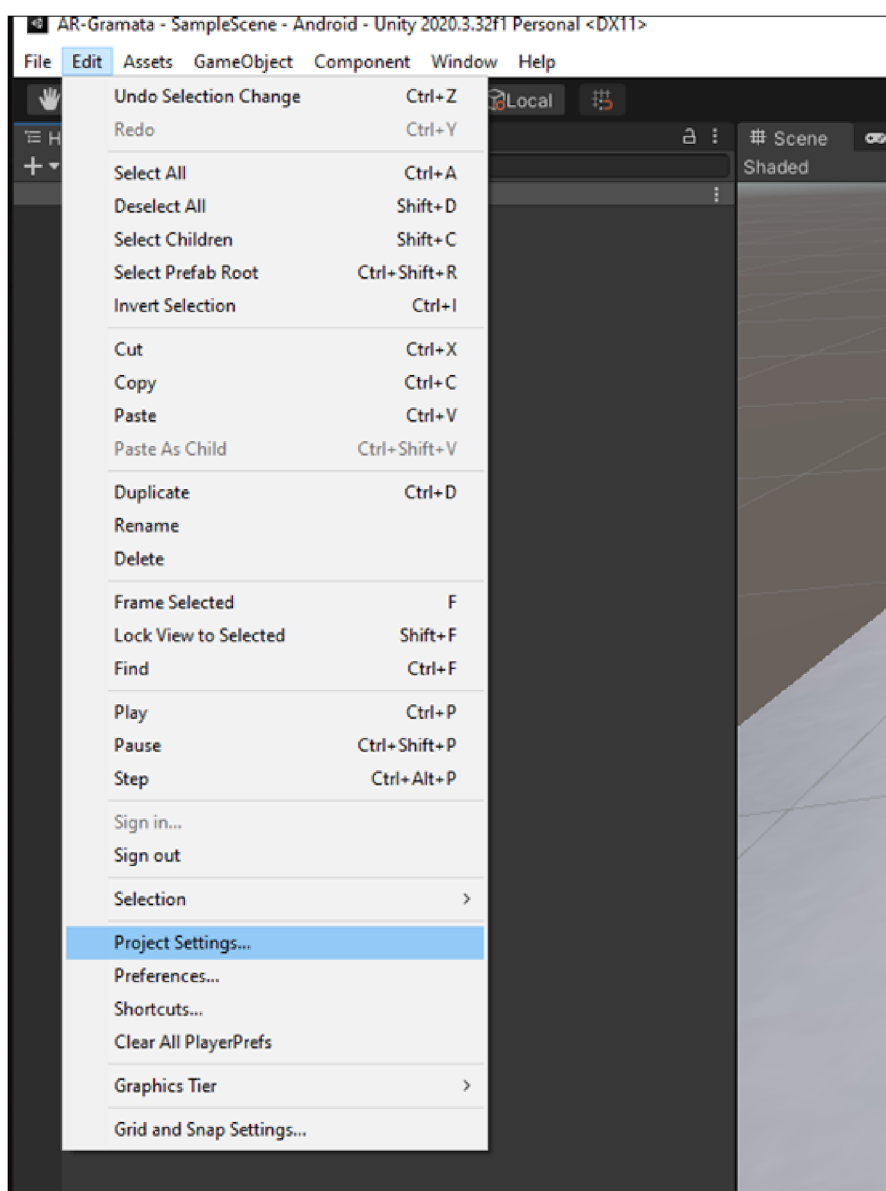
Step 63: Press on “Add Open Scenes” then select the platform as “Android”, after this click on “Switch Platform”. If its already set to android you can skip this step.



Step 64: Wait until it has reloaded. After that close the Build Settings window.

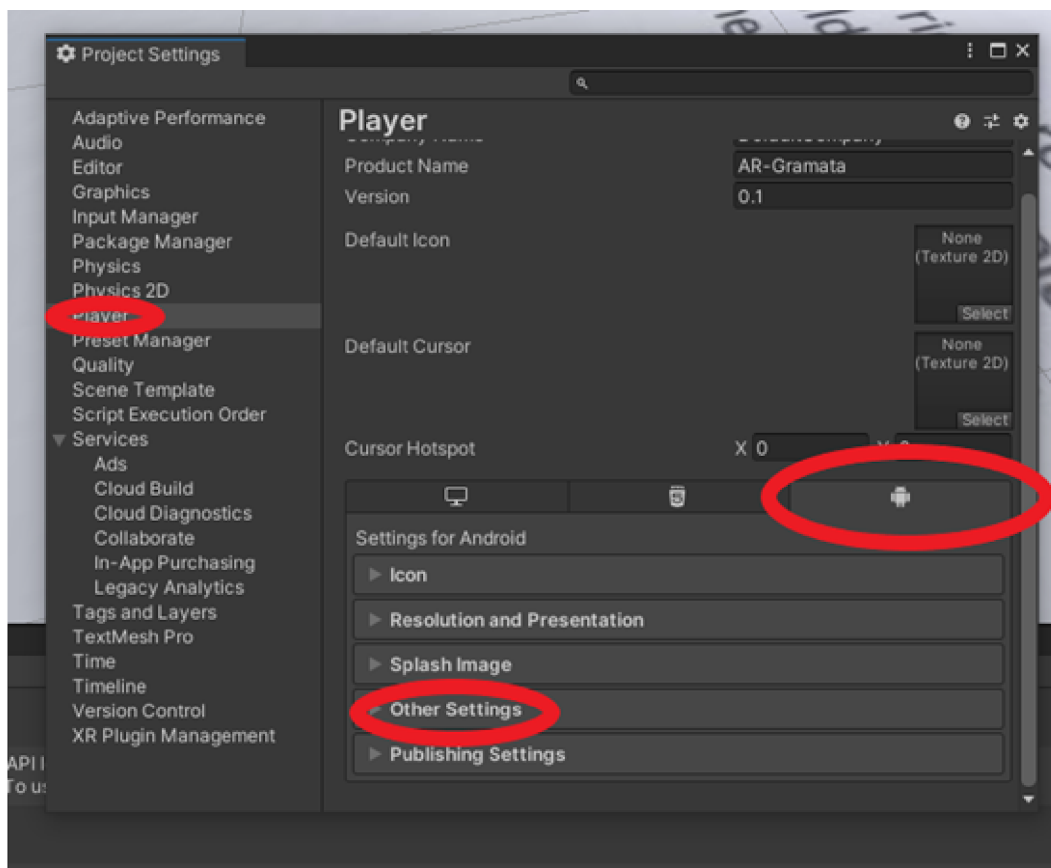
29

Step 65: On The Left top corner hover on “Edit”, after that press on “Project Settings”

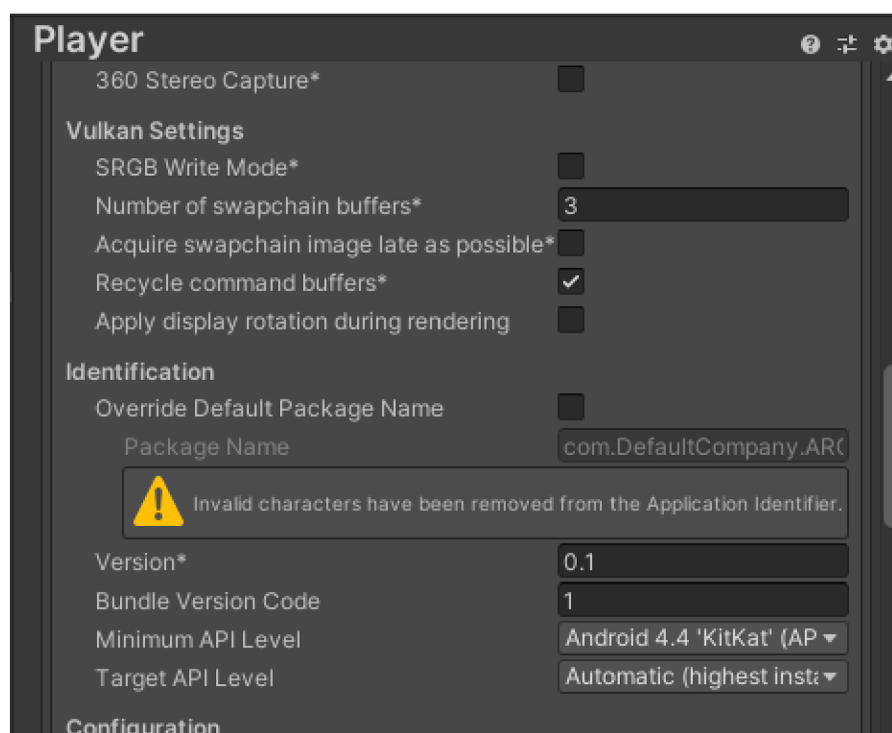


Step 66: Click on “Player” then on Android icon and then on “Other Settings”.

30

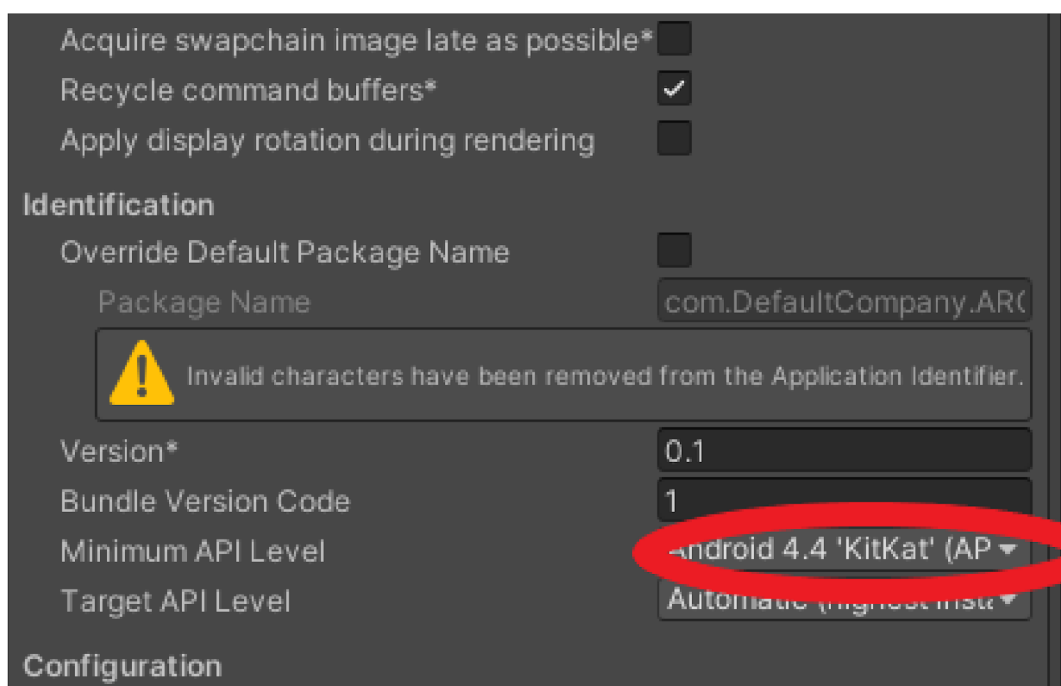


Step 67: Scroll down until you see this

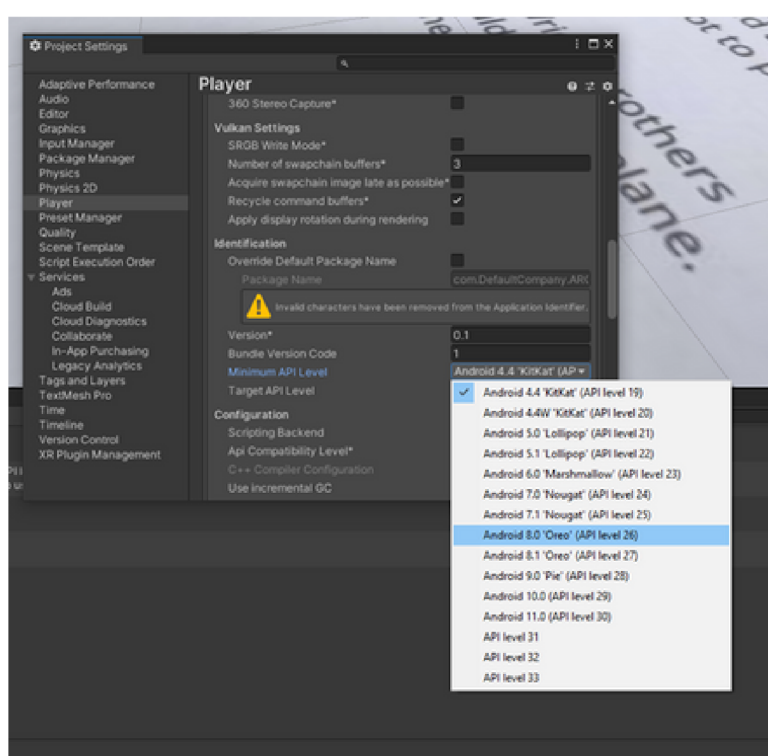


31

Step 68: Click on Minimum API Level.



Step 69: Change it to Android 8.0 'Oreo' (API level 26)



32

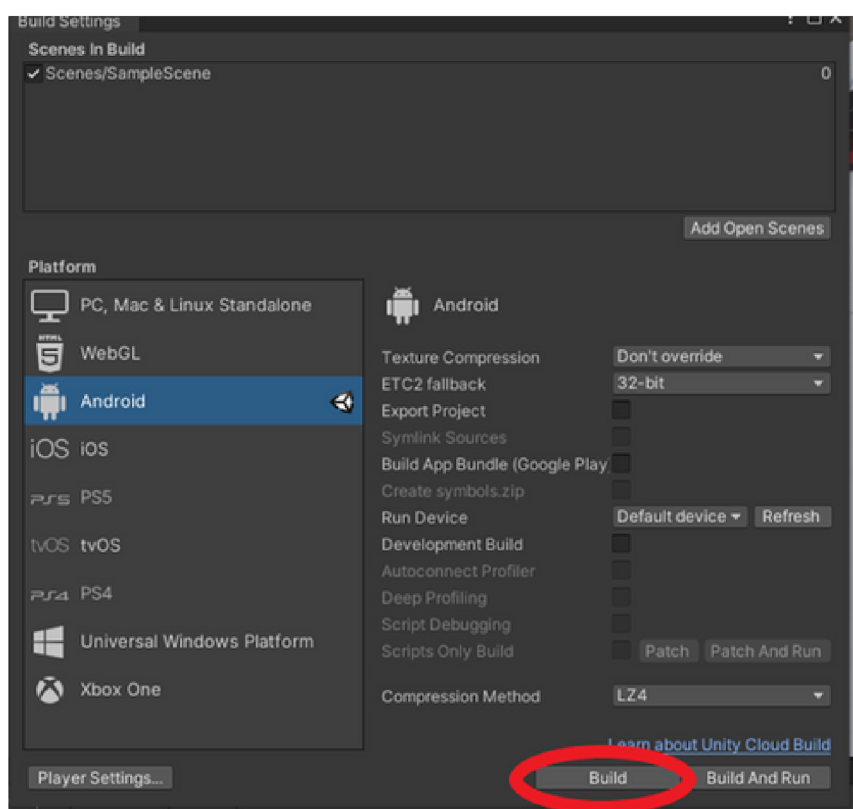
Step 70: Close the window and press Ctrl + S again.

Before exporting if you want to make another page or animation to the model scroll down to find the extra steps to do that. If you will want to do this afterwards you will need to export twice.

Bulding and using the APP

Step 71: Repeat Step 62

Step 72: Press "Build".



Step 73: Name and save the file wherever you want.

Step 74: If you have done everything correctly it should finish building and you should see the file where you located it.

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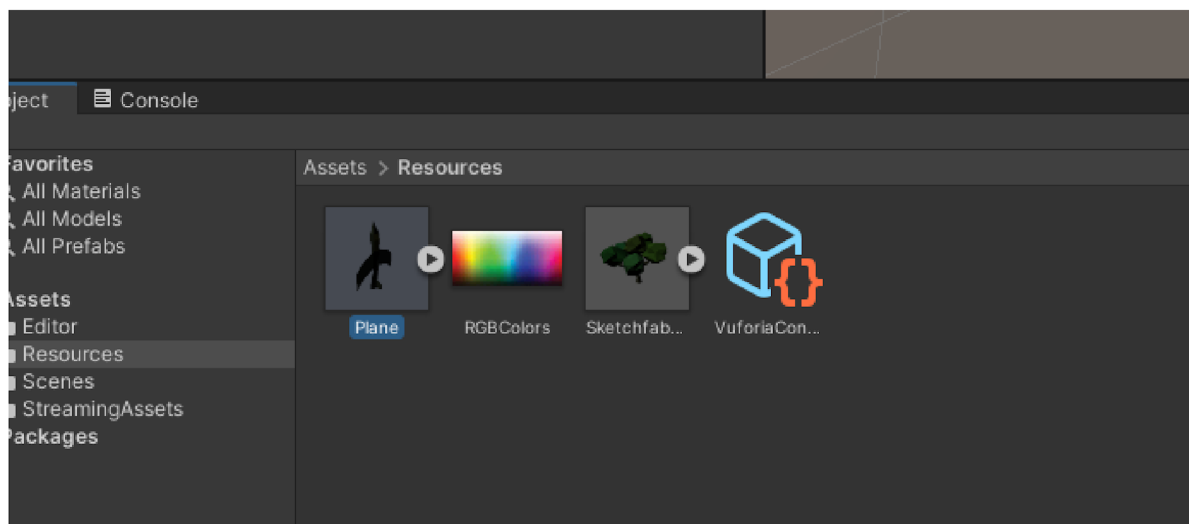
Step 75: Last step. Get this file to your phone. When you get this file to your phone Press on its icon and install it. It may put out a warning, but ignore it, because the game you created is not seen anywhere else so the system may think its a malevolent file.

Open up the application, it may take a while until it starts showing something. After that point your camera on the printed out page 4 and you should see a plane.

Extra step: Animation

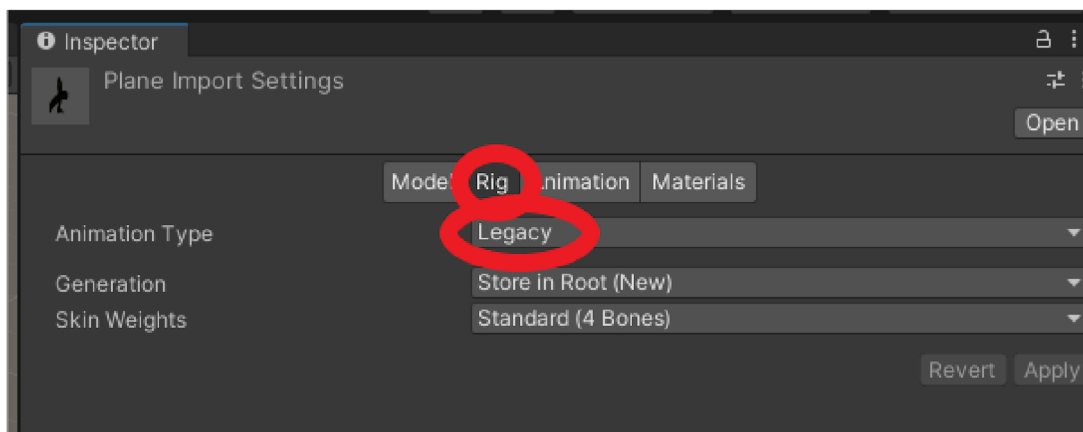
Follow these steps to animate the plane by making it fly.

Step 1: Left Click on “Plane” Model

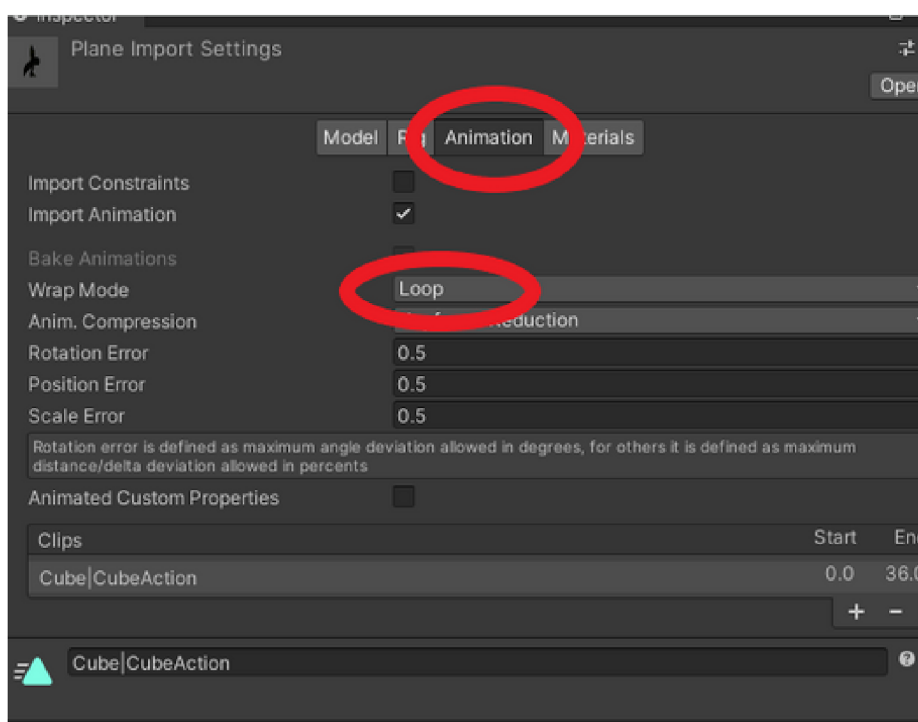


Step 2: On the Right side of your screen a new tab should open up. Press on “Rig” and change the animation style to “Legacy”

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Step 3: Click on “Animation” and the set Wrap Mode to “Loop”.



Step 4: Press “Ctrl + S” to save the project.

Step 5: Repeat steps 71 to 75 related to building and using the application.

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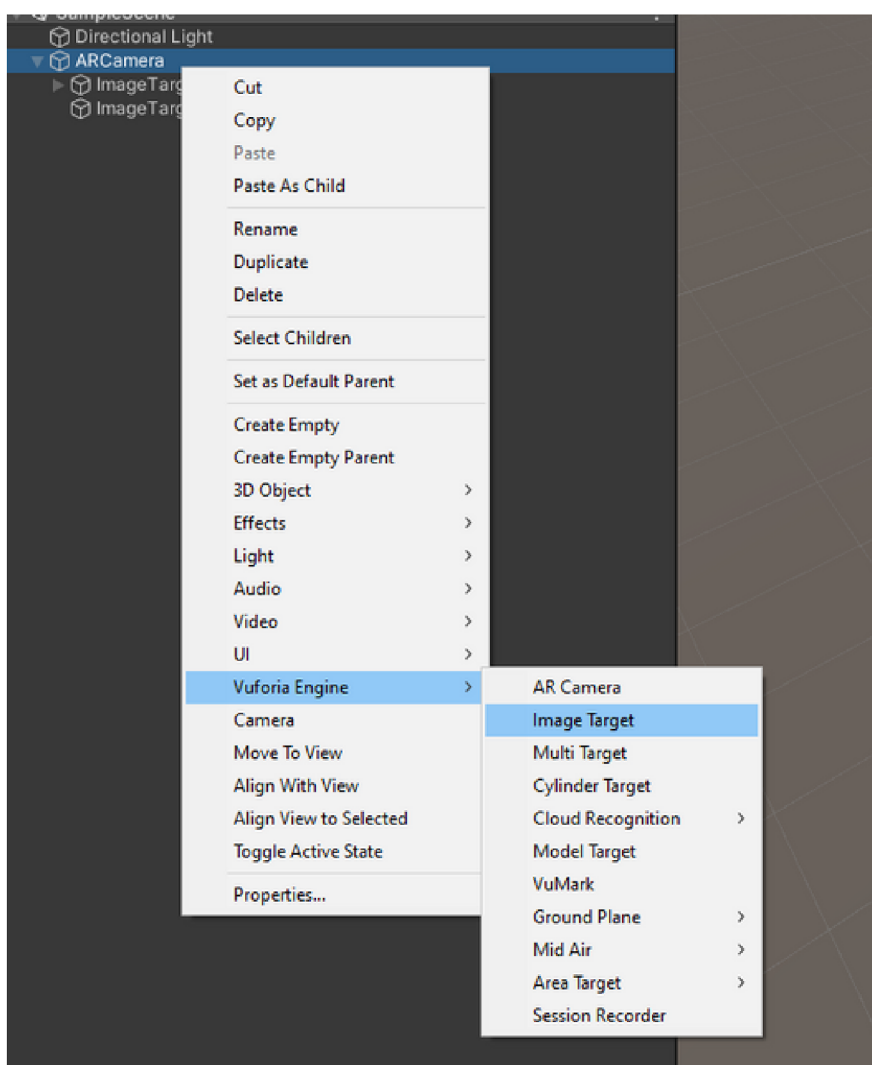
Extra Step: Adding an extra page

Follow these steps to make another page in this application.

Step 1: Repeat steps 22 to 26 but with a different page. Save the picture in the same database. I will be using page 3 for this example.

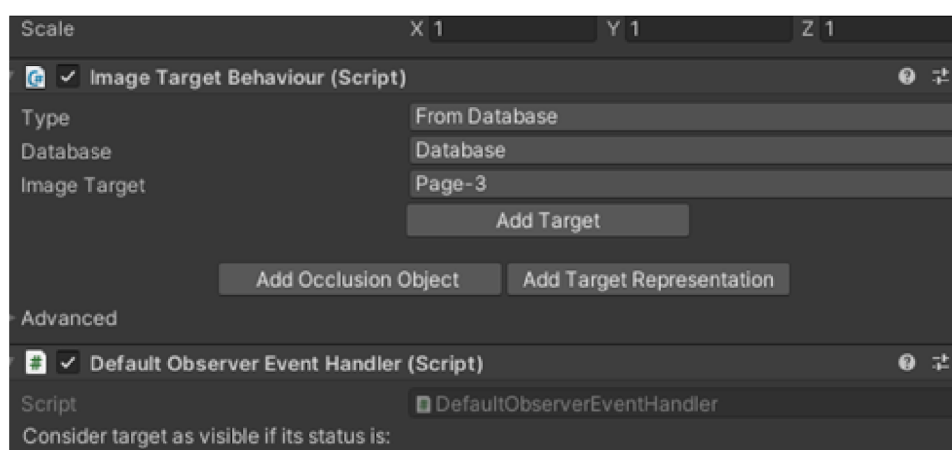
Step 2: Repeat steps 48 to 51 with the same database.

Step 3: Create a new "ImageTarget" By right clicking on ARCamera and hovering on "Vuforia engine" and pressing "ImageTarget"

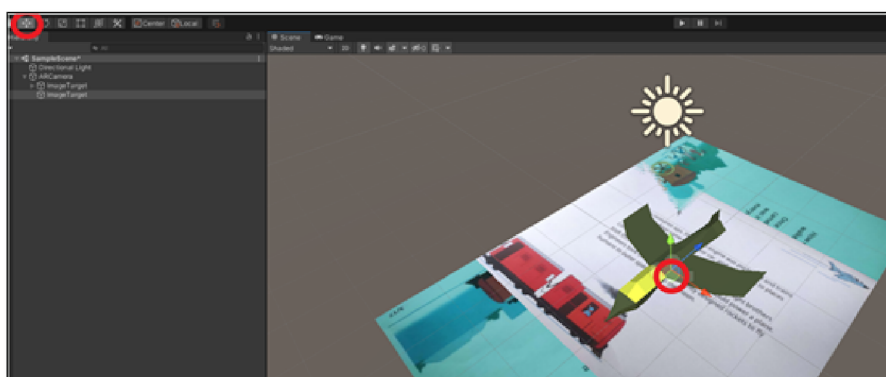


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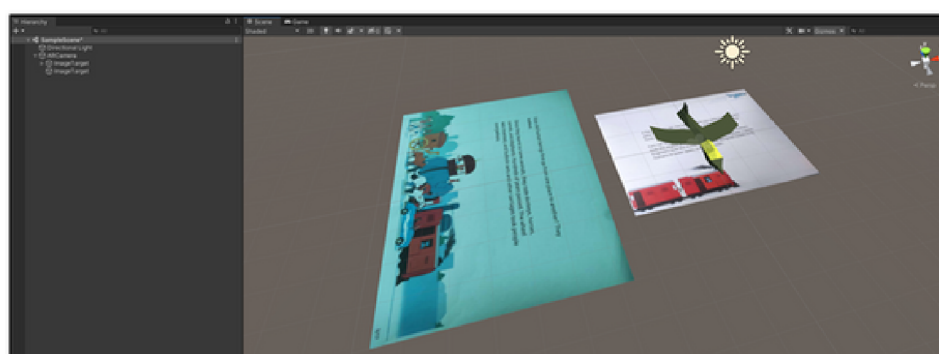
Step 4: Left click on the newly created ImageTarget and on the right side select "From Database" then "Database" it can be different depending how you named your database. After that add the new picture you took.



Step 5: Move the picture using the moving tool.

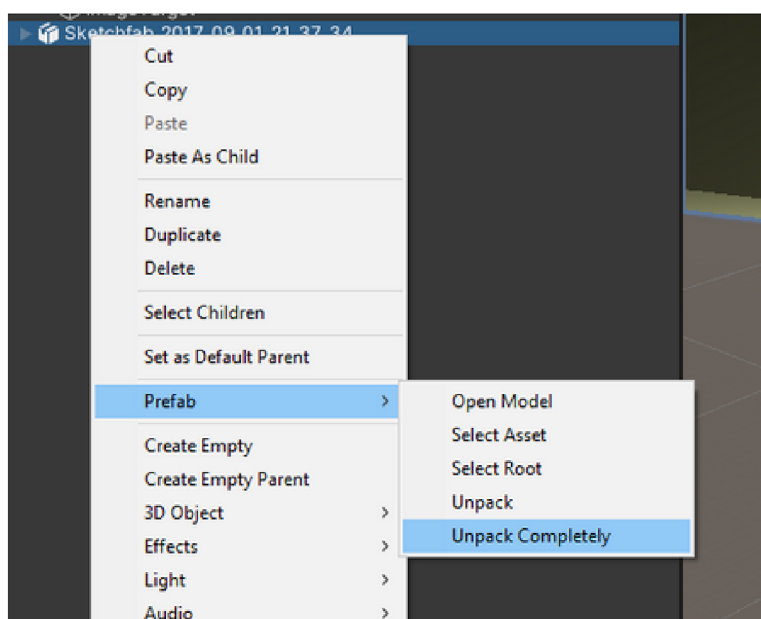


Step 6: Move the picture using the moving tool.



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Step 7: Repeat step 55 with the new model. If the new model has a light and a camera right click on it and hover over “prefab” and press on “Unpack completely”. If you want you can find another model by yourself if you want to make more pages later on.

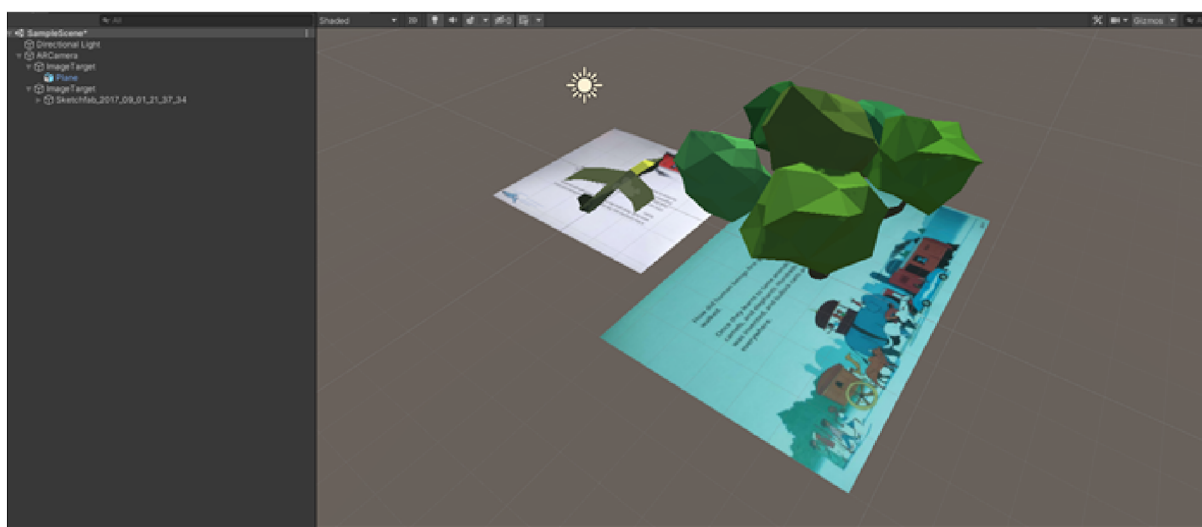


Step 8: After unpacking press on the little arrow. After that find the camera and the light and delete them.



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Step 10: Your workplace should look something like this



Step 11: Press "Ctrl + S" again to make sure its saved

Step 12: Repeat step 71 to 75.

Using this you can make many more pages or even the full book.



Jobs of the Future is an international cooperation co-financed by the Erasmus + programme of the European Union. It aims to create synergies between enterprises active in the tech sector, youth organizations and educational institutions. The objective is to empower young people to pursue their own professional and educational goals in the tech field.

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