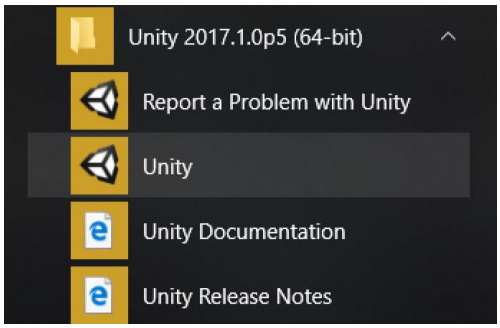
Immersive Environments Tutorial

Unity

Goals:

- Animation

Load up unity



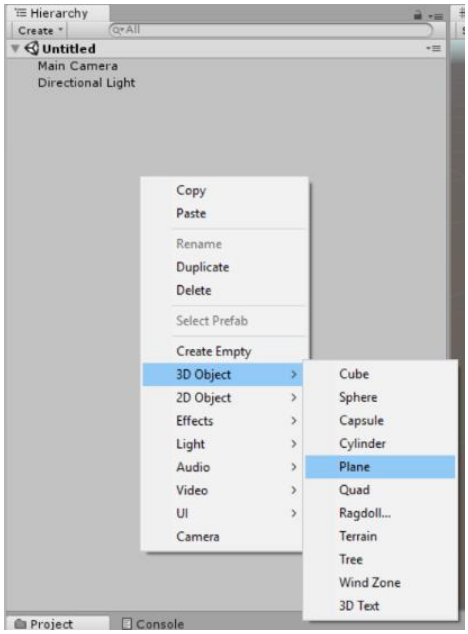
Build Object: Basic Animation

Aim: Use Unity's inbuilt animation tools.

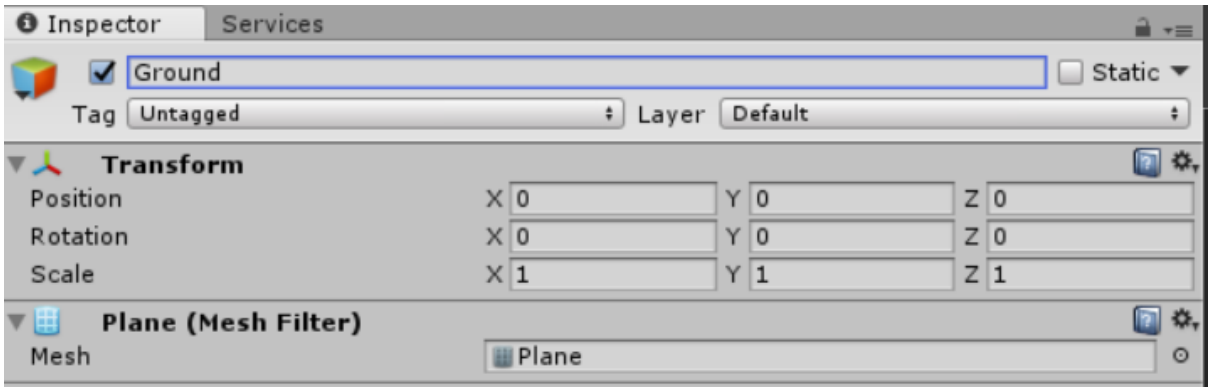
In the hierarchy, right click and create a plane and a cube.

To start with let's create a plane.

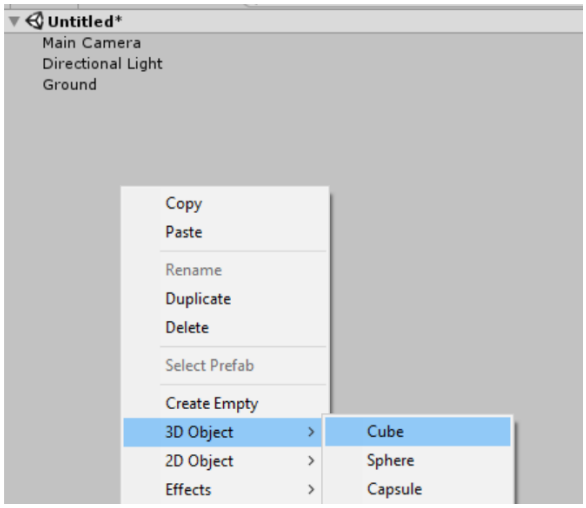
Right click in the Hierarchy and select 3D object->Plane



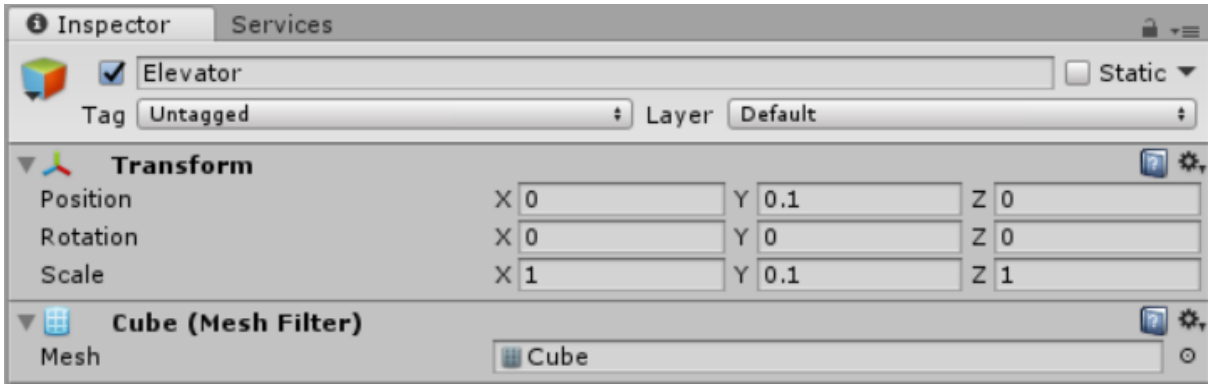
In the inspector elements of the plane, change the details to the below



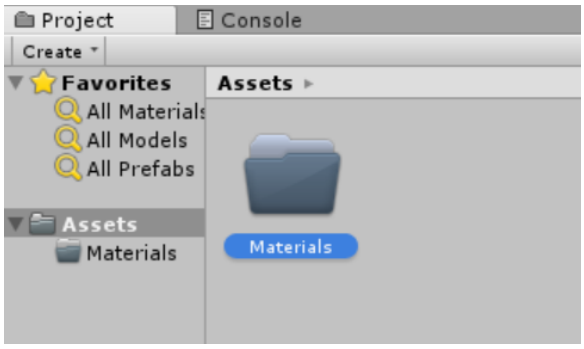
Next, right click in the Hierarchy and select 3D object->Cube



In the inspector elements of the plane, change the details to the below

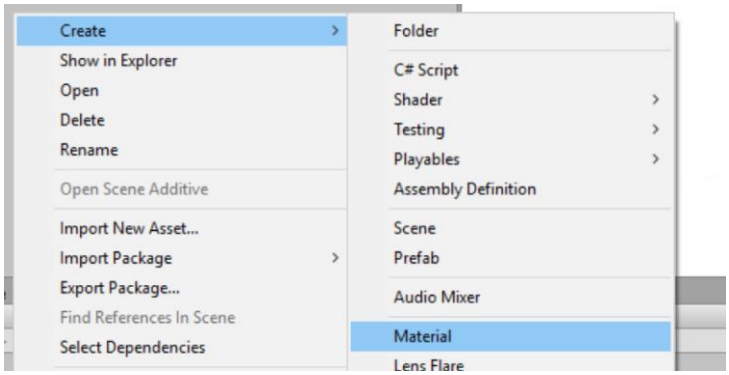


In the Assets folder, right click and create a folder called Materials

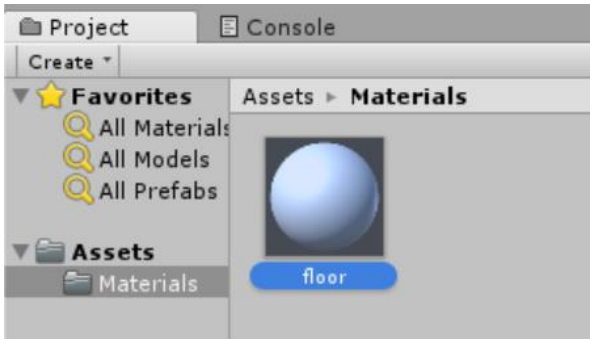


Double click inside Materials folder.

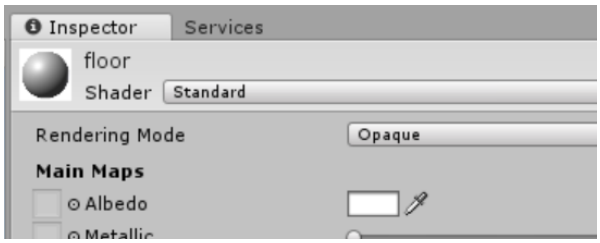
On the blank settings, right click and select Create→Material



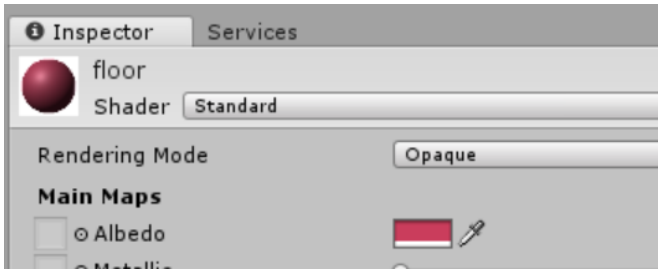
Name the material floor



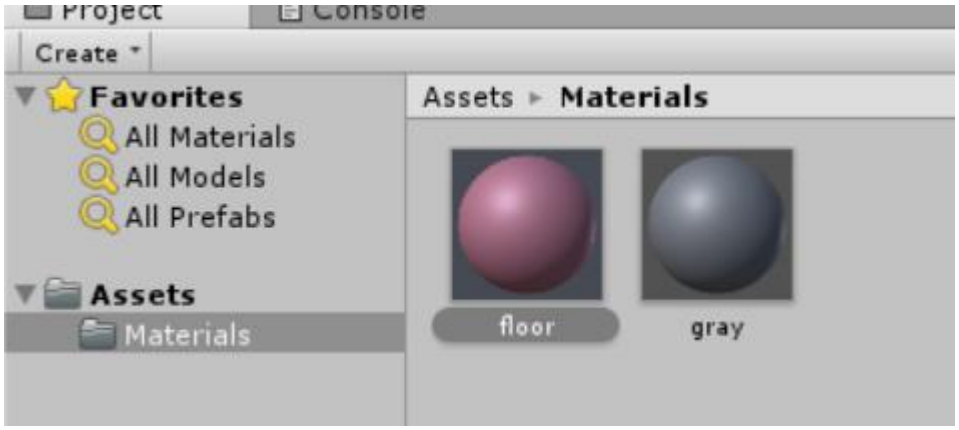
From here, go to the inspector and change the colour settings on the next to the albedo



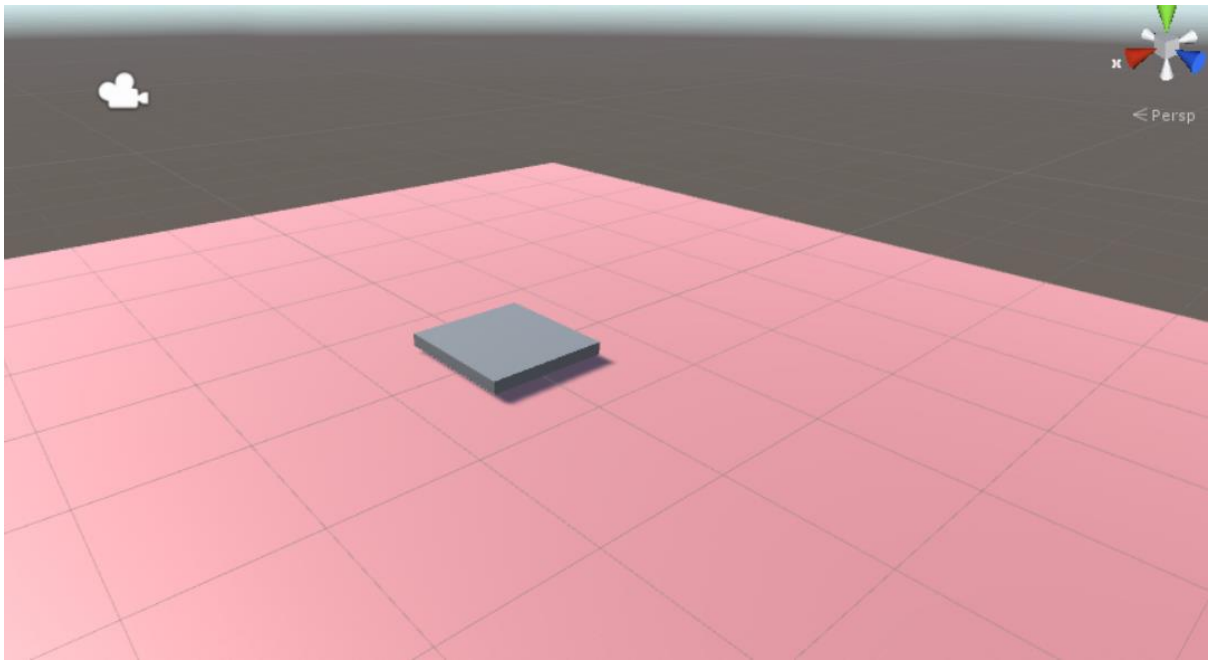
Use the colour wheel to select any colour.



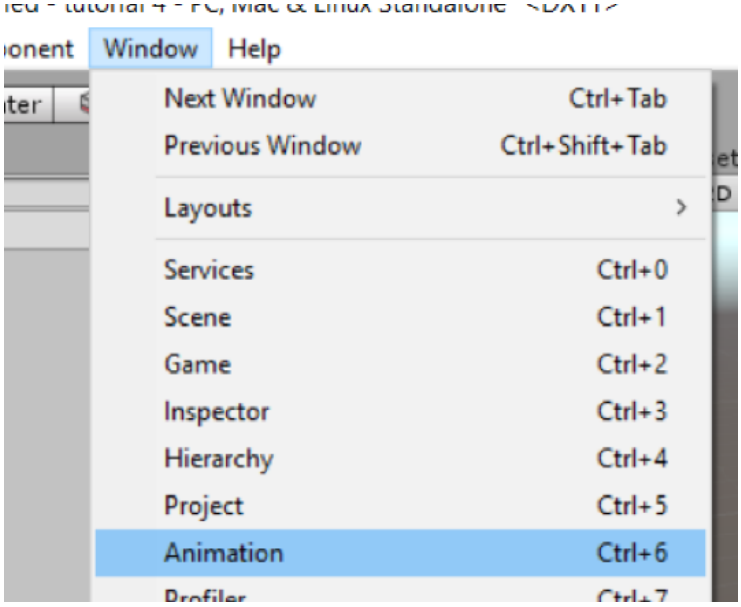
Once this is done repeat the process to create a new material called gray.



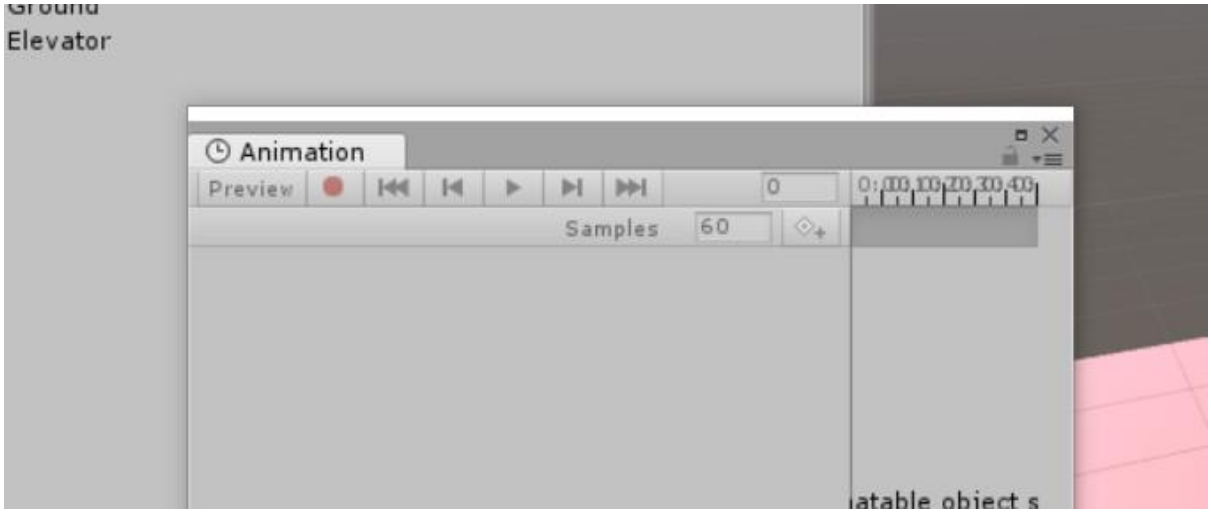
Apply to the objects, by dragging the material on the ground and elevator. Your scene should look like the following:

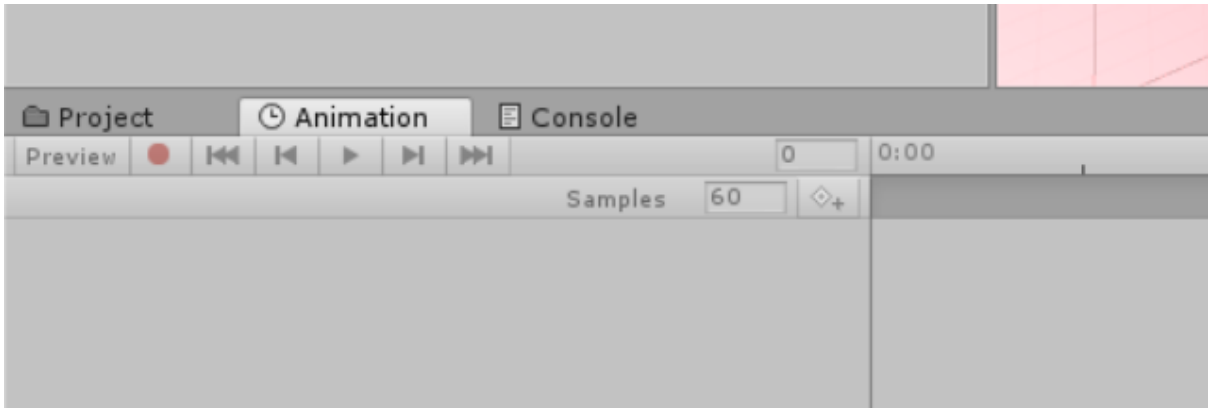


Next, we will open the window ->Animation panel

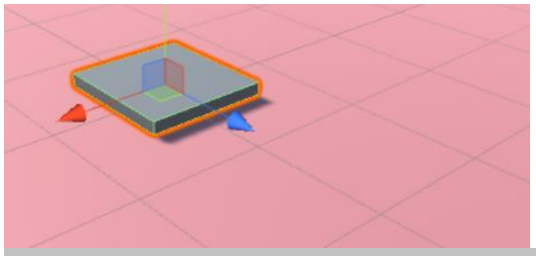


This will open a floating window, you can grab the tab name and drag it next to the console tab

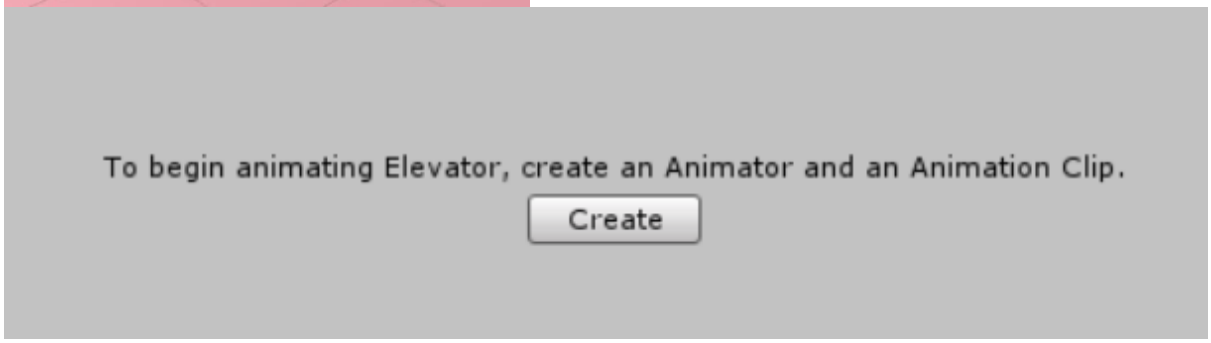




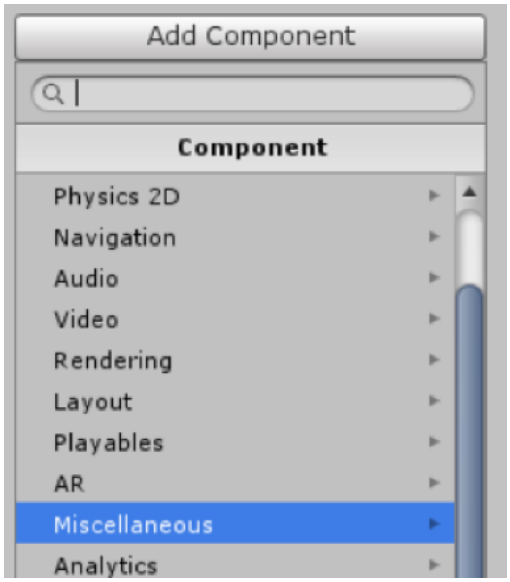
Next select the cube

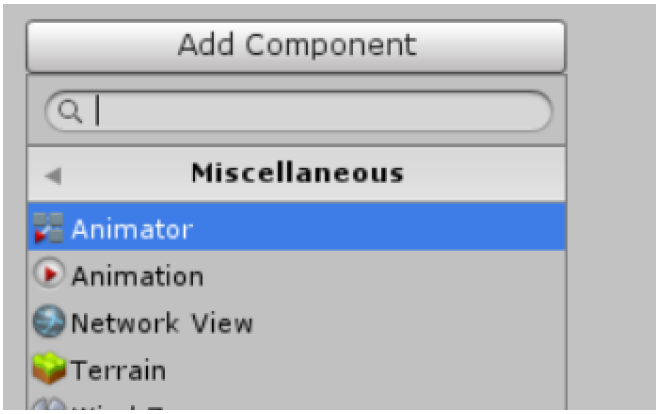


Once the cube has been selected, you will see that the timeline in the animation has a created a Create button.



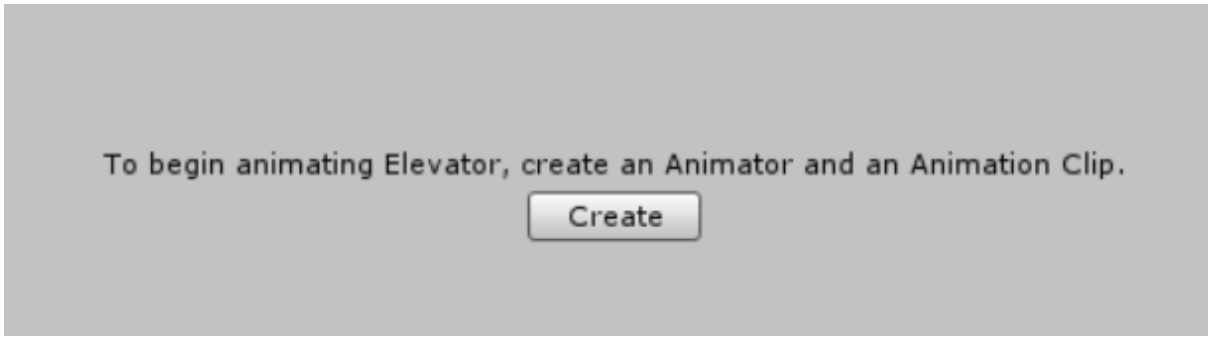
Before we click this, we need to add a new component to the cube, this is the Animator component. This is done by going into Add Component->Miscellaneous -> Animator.



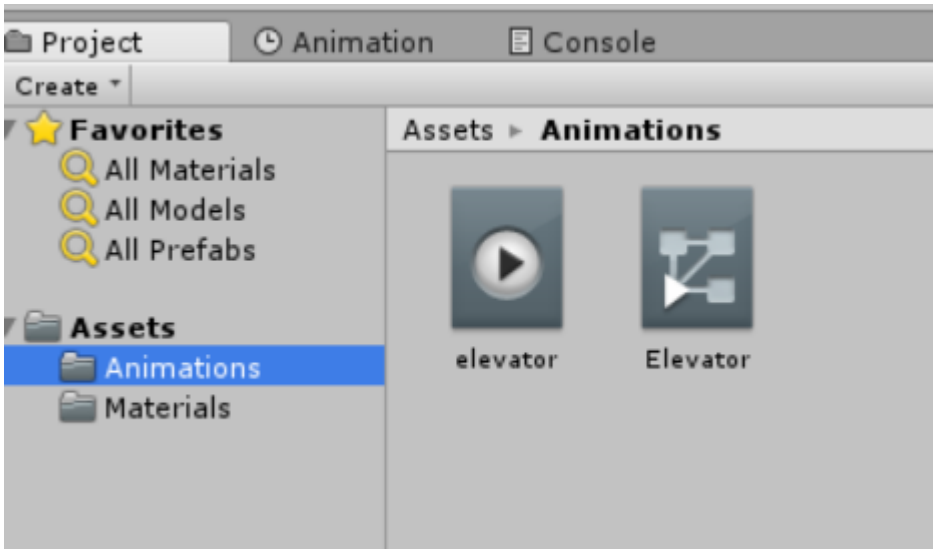


This adds the animator capability to the cube.

Now, we click on the create button in the animation timeline.

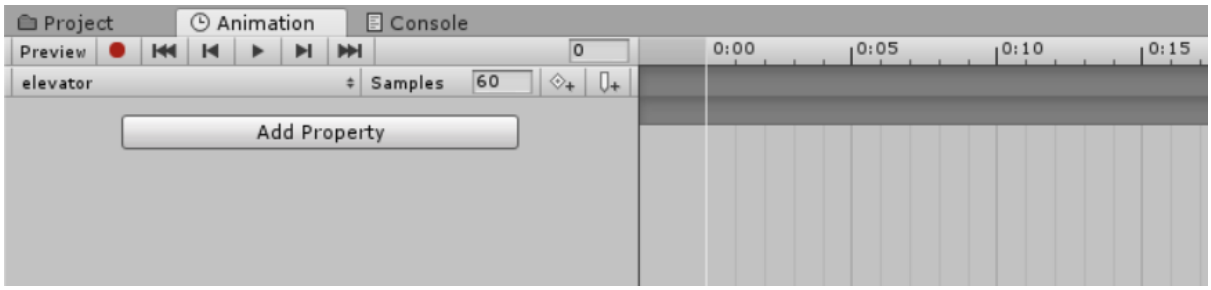


Create a new folder for Animations in the assets folder and save the anim file inside there.



If you look at the inspector you will see that the Controller aspect of the Animator component has now been linked to the Elevator anim file we just created.

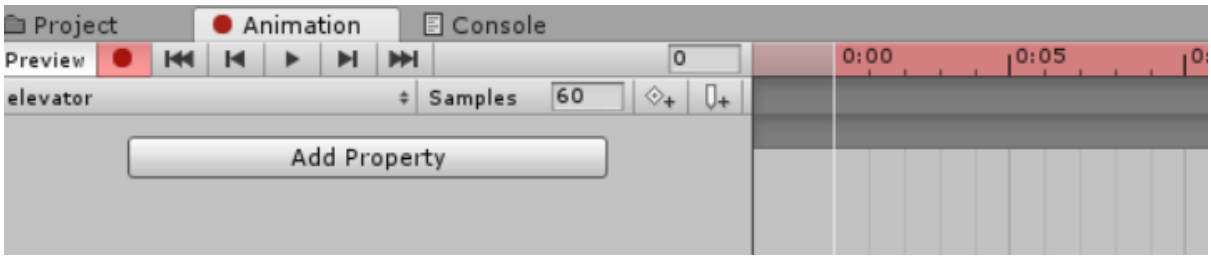
When looking on the Animation tab, you should see the following.



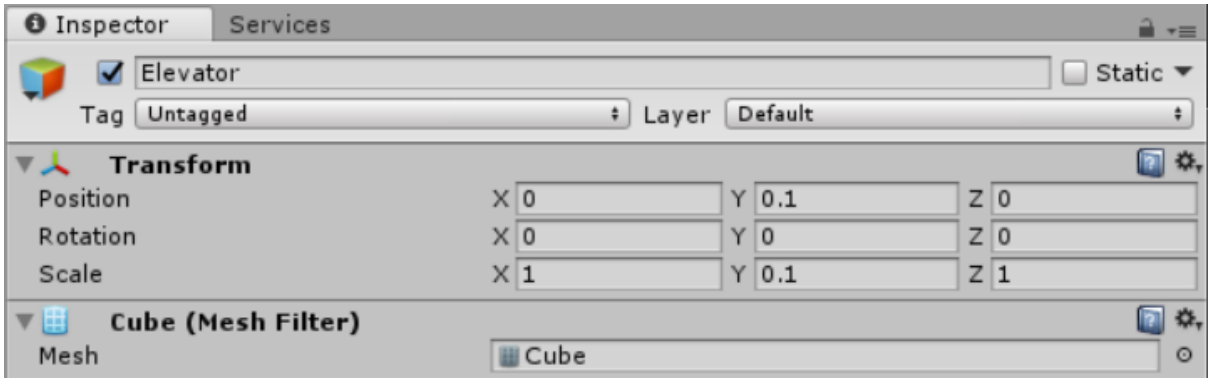
The panel has the basic commands we would expect, such as a record and play option. So, we start with a goal of moving the elevator up and down. To do this, we are going to have to change the Y axis point. Similar to Maya, this is done with Key frames, except that unity automatically adds in the graph editor capability to ensure smooth transitions.

The samples number, is the number of frames per second, with the timeline working in seconds.

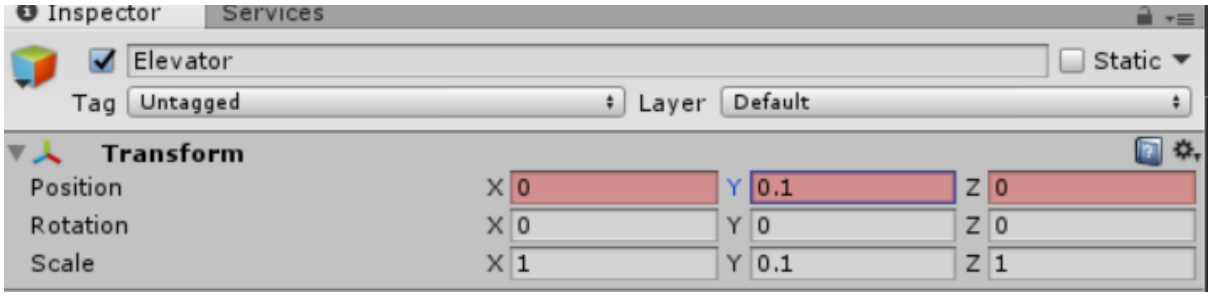
To record a key frame, we need to click the record button.



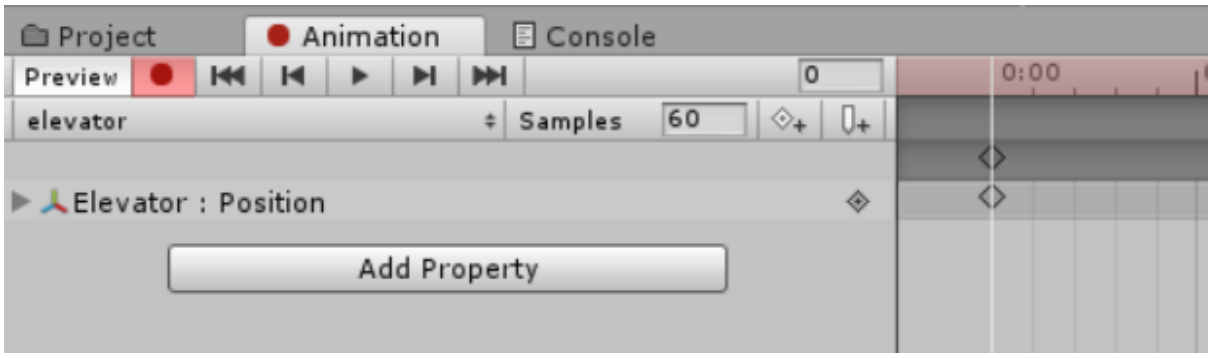
Notice the introduction of colour to the timeline and active button. Now, if you look at the inspector element nothing has been changed, it should look like this:



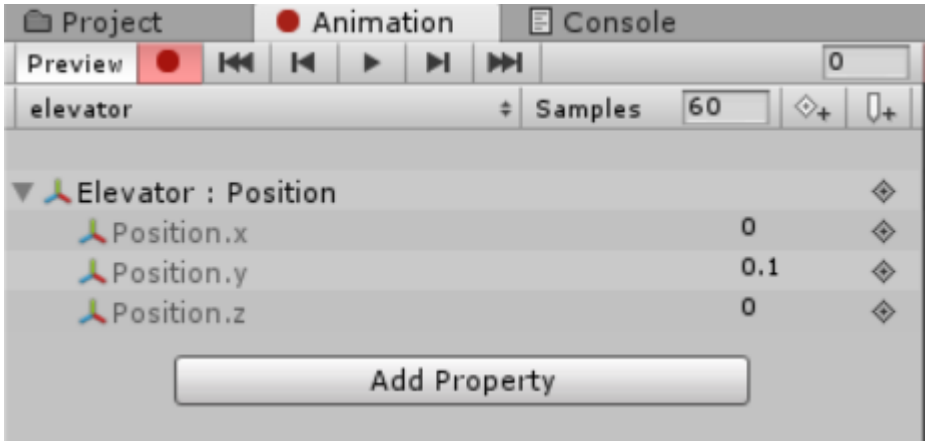
To create the key frame, something needs to happen. In this case, just re-type 0.1 over the Y axis.



Now, we have a visual notification that an element is being recorded. In the Animation panel, the Elevator has been added, with corresponding key frames.

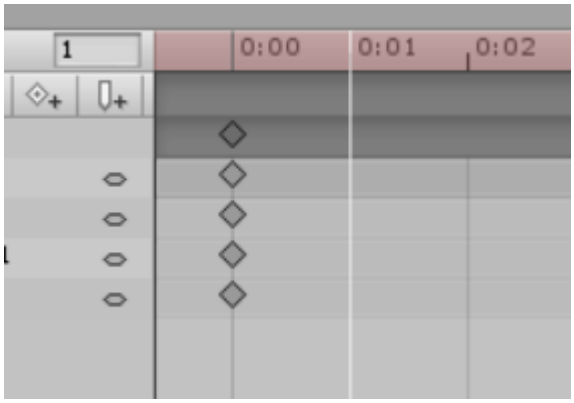


If you expand the Elevator object in the animation panel, then you will be bale to see the effects that are being modified.

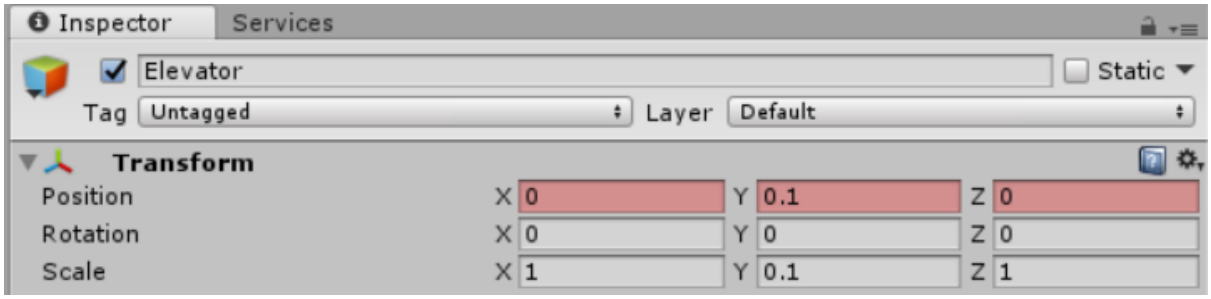


Like all good animation, we should have a plan for what we are going to do, so the goal is keep the elevator object on the ground for approximately 1 second, raise it over 6 seconds, keep it there for 1 second and then return it to the ground. This way when the animation loops, it should be continuous clean movement.

In the timeline, move the frame selector to the 1 frame mark. Hold down ctrl+ scroll to zoom in on the timeline.

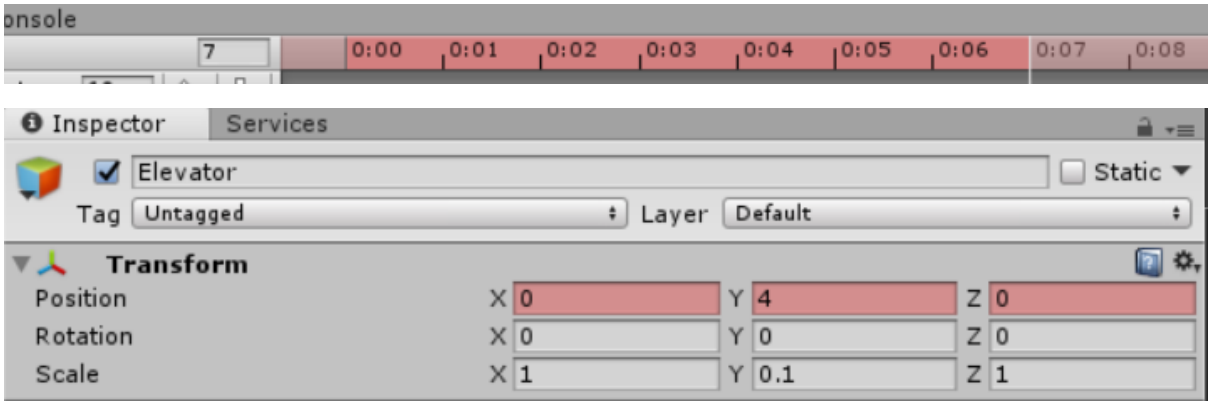


From here, re-type the Y axis at 0.1

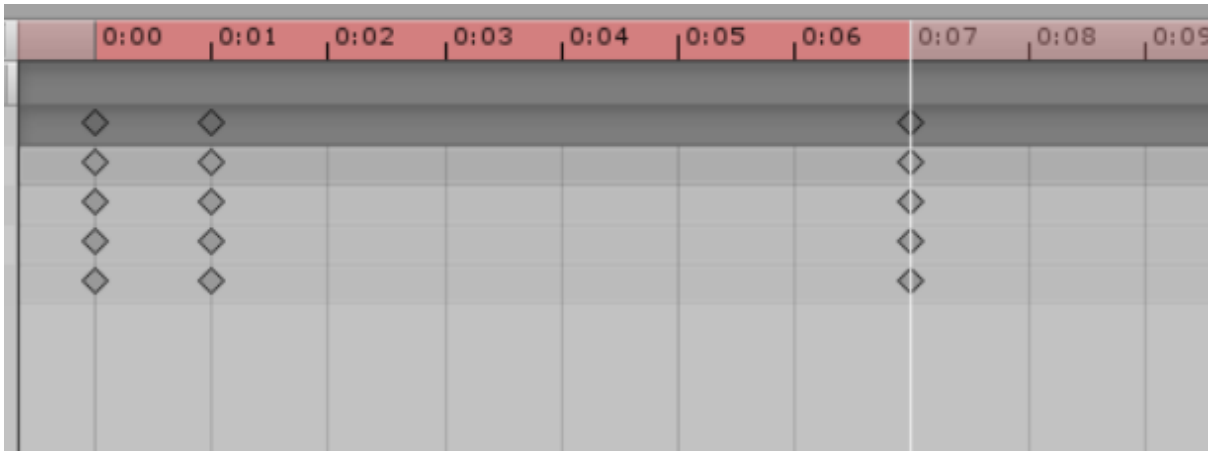


This will generate a new set of key frames.

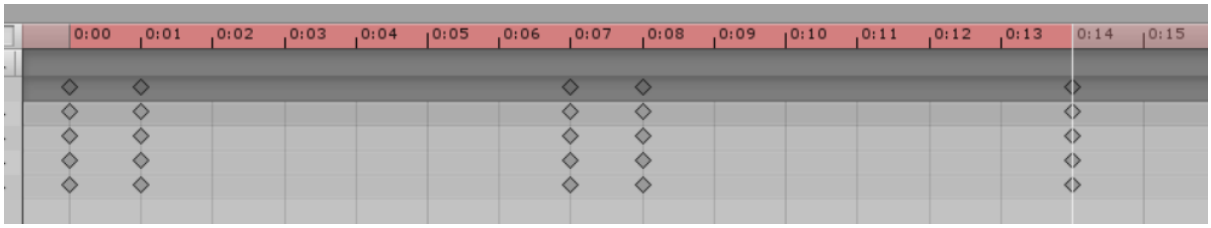
Now, we move the frame selector to the 7-frame mark. And change the Y axis to 4.



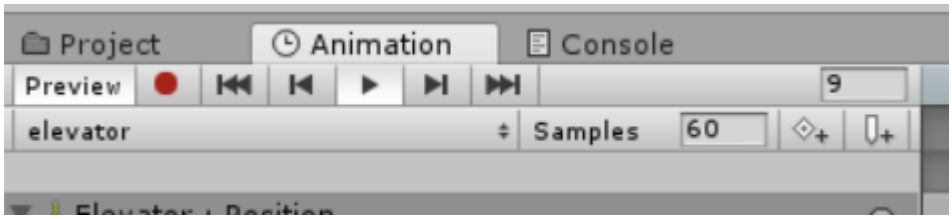
This will generate the following key frames



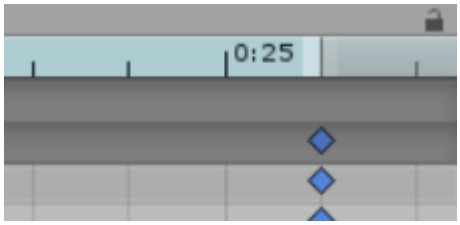
Now, move the frame to 8, change the Y axis. This will generate the holding pattern at the top. Then, move to the frame to 14 and change the Y axis to 0.1. This should give the following key frame pattern.



Now stop the recording by push the red icon and then push play to see how fast the elevator is moving.

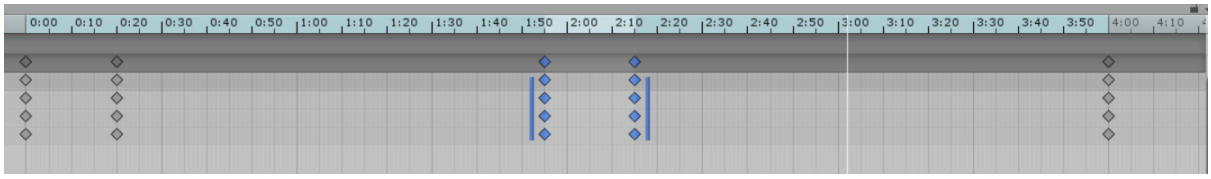


As you can see this is quite fast for an elevator, push the play icon to stop the animation. So, we need to increase the time frames, to do this we can select the top icon and drag it out to a larger time frame. The icon will turn blue when selected.



Move out the 3rd and 4th changes to make sure our 'up' section is balanced. If you hold down shift, you can multi select points to move a group.

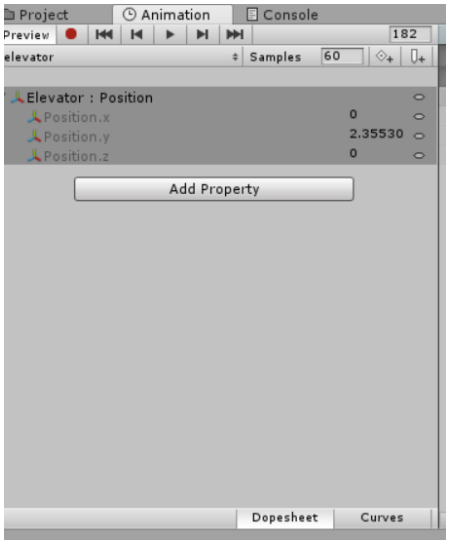
The following provides a slower lift area



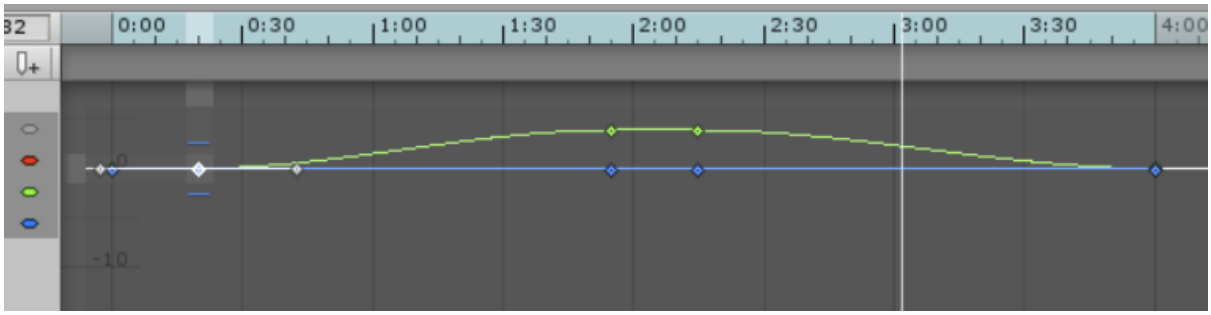
Times are:

- 0.00
- 0:20
- 1:55
- 2:15
- 4:00

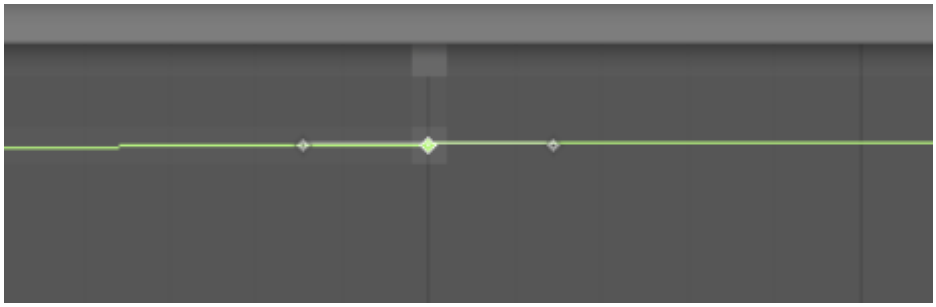
Now keyframes are easily done, but as I mentioned earlier there is a built-in graph editor for this as well. At the bottom of the animation tab, there is a Curves button click on that.

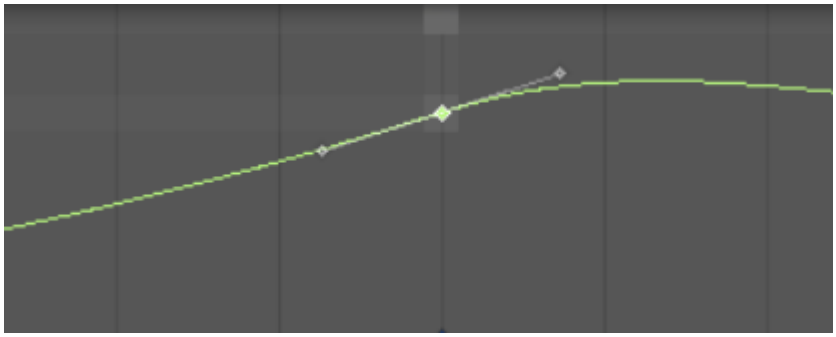


You will be presented with the following view, note I scrolled out the view to make it fit better.

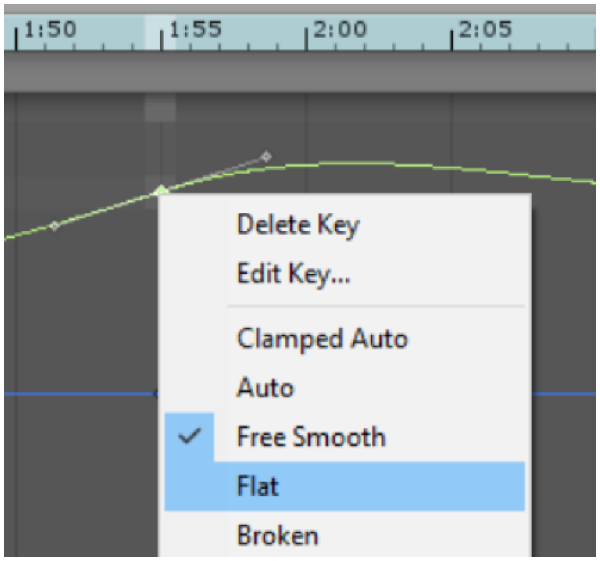


If you zoom in on a point, you will see that the point has handles in which we can affect transition of the animation.

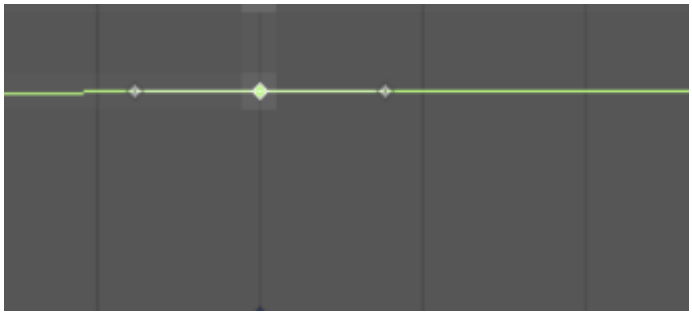




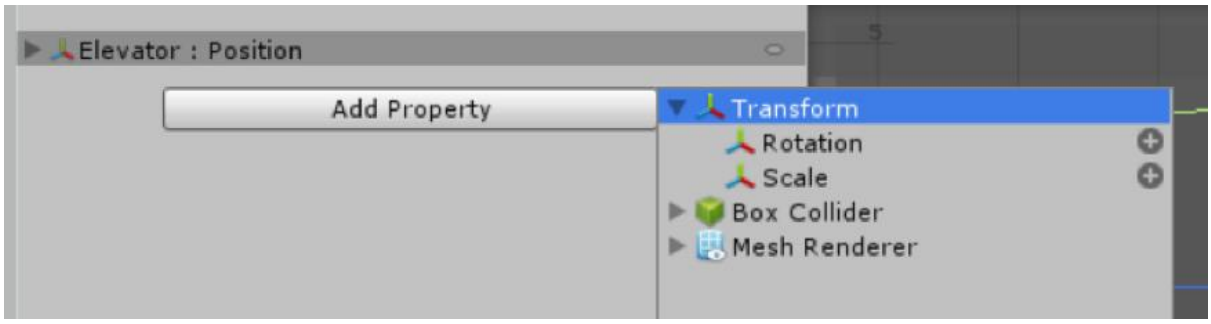
This can change the speed of entering a particular frame. As a side note, if there are elements that are too inconsistent near a key frame, you can right click on the keyframe and select elements such as flat to eliminate the issue.



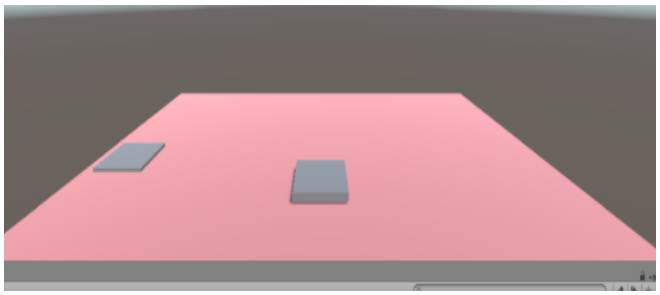
This will fix up the curvature of the animation.

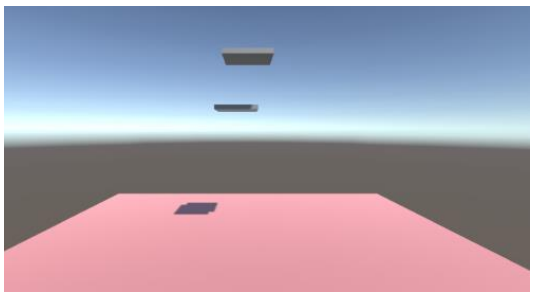


The add property button allows for additional elements to be added to the object for animation.



Generate a secondary elevator and test, have it so that the elevator steps are raised to the top at the same time and then land on the ground at the same time. i.e.





Video Recording & Compression

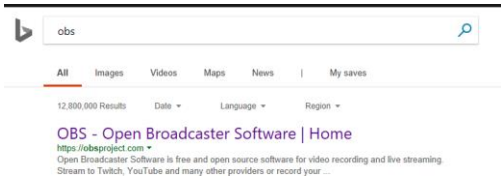
Goals:

- Examine two free pieces of software for video recording and compression;
    - OBS – Open Broadcaster Software
    - Handbrake

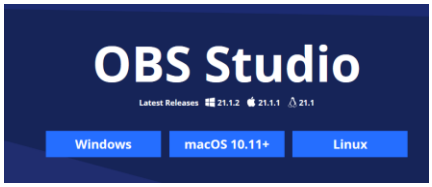
To begin with download the software.

OBS

In a browser, search for OBS



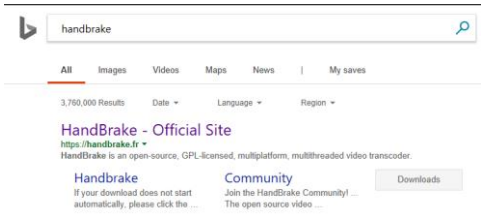
From here go the website. Select the version based on your Operating system



Save to a location you can locate (Desktop/Downloads folder).

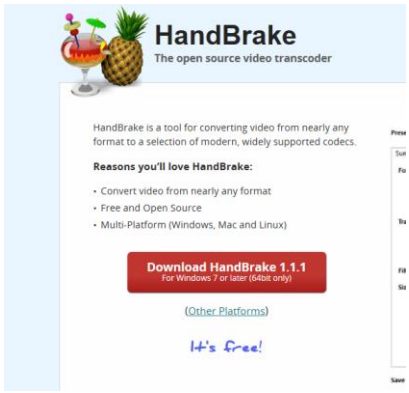
Handbrake

In a browser, search for handbrake

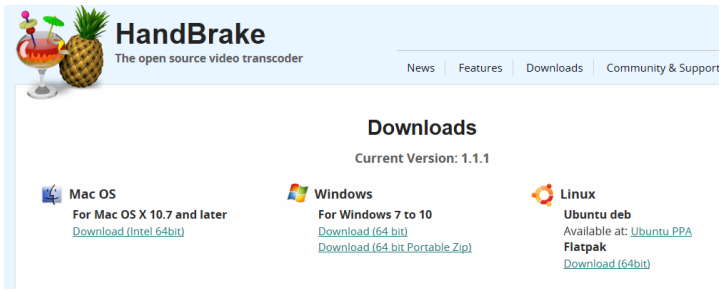


From here go the website. Select the version based on your Operating system

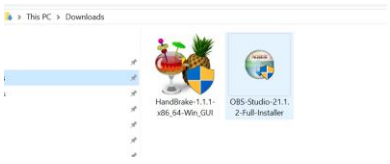
For my system, windows, it's first on offer:



Otherwise click on (Other Platforms) and select the Operating system you use.



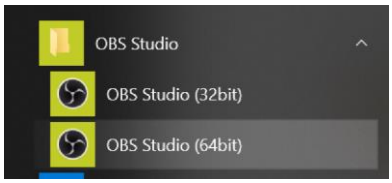
Once you have downloaded both pieces of software, install them as you would any other software.



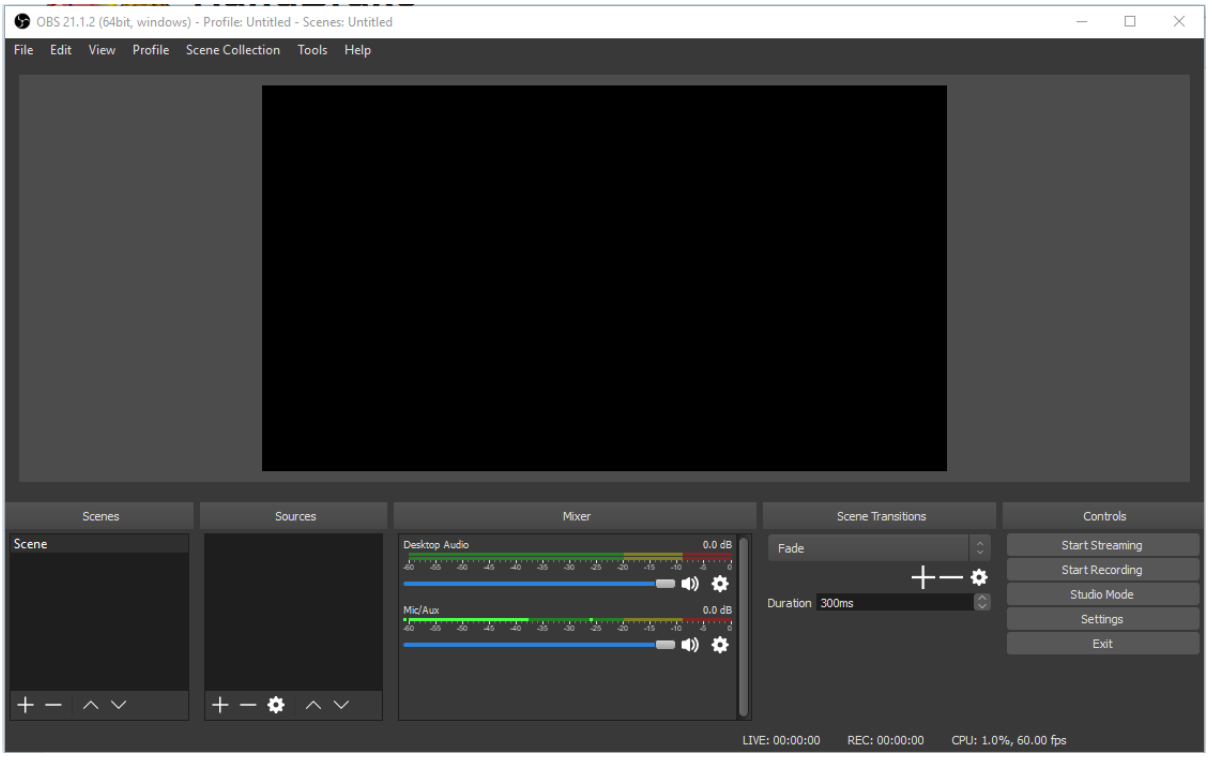
Remember, if this is done on a university machine, the software will be removed upon the next reboot, so keep a copy on a USB or online drive such as Gdrive or OneDrive.

The order of using the software is, OBS to capture the video, then once that is done, use Handbrake to compress the software.

Open up OBS



You should see the following screen

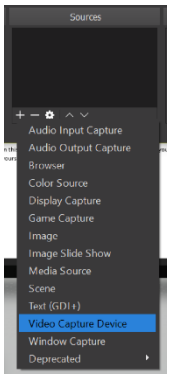


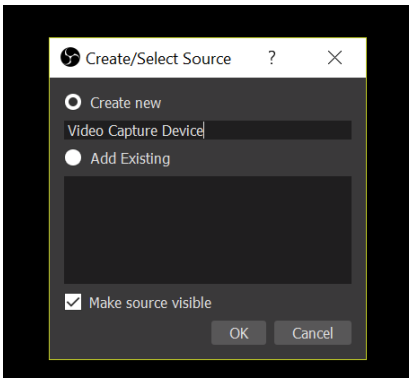
From here, what we need to add are the sources from where you are getting your video from.

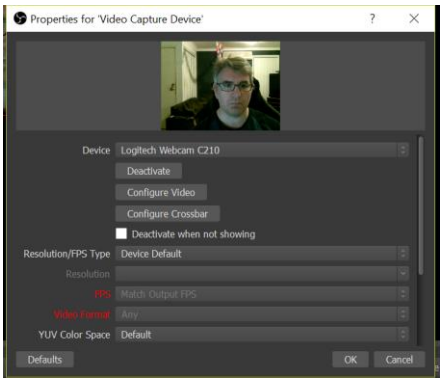
To do this, select the + in the sources box.

In this case, we are adding a video source, as for the exam you need to record yourself answering questions. As such select “Video Capture Device”.

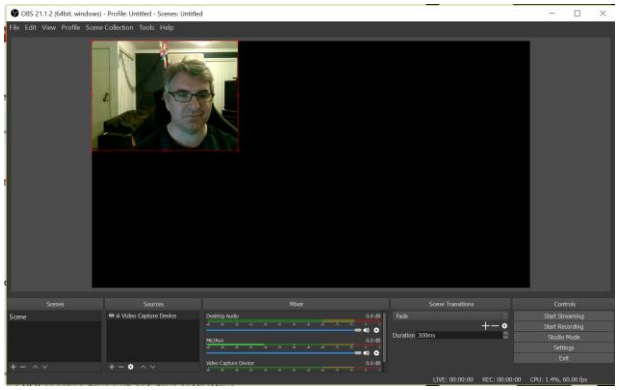
And follow the basic prompts.



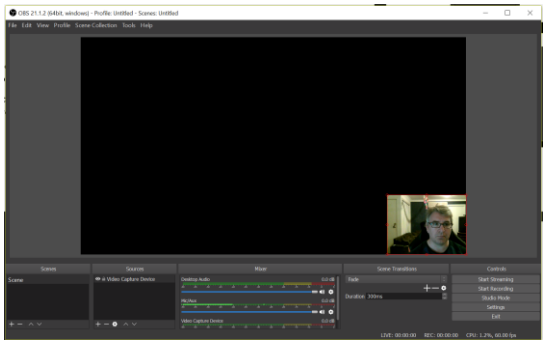




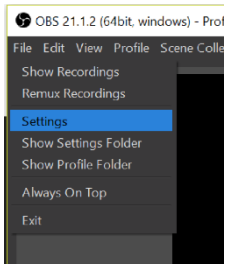
This will give you a window in your OBS screen that will record you.



The red box around the webcam input can be dragged to any position in the screen. i.e.

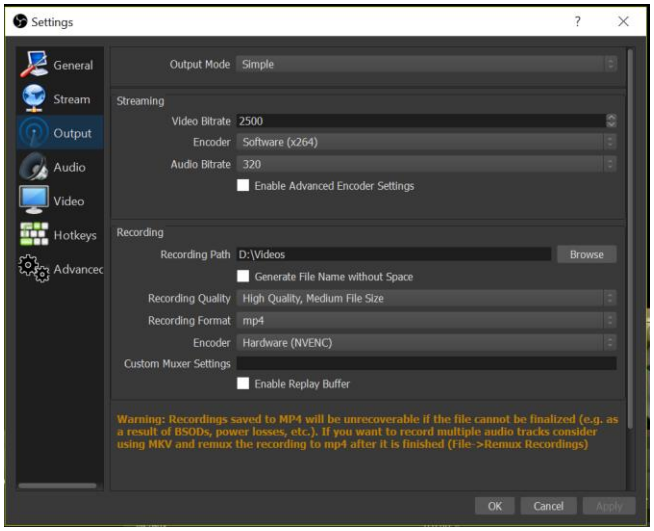


Next we want to setup the output for the video. Go File→ Settings



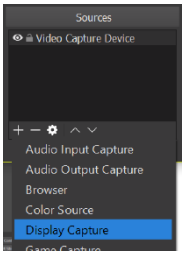
This will open the following window, down the left hand side, select the output menu option.

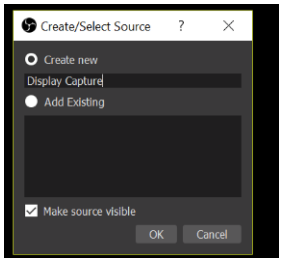
From here, select the output path, in this case it's d:\video, but I would suggest on the desktop to find it easier. And ensure the recording format is mp4.



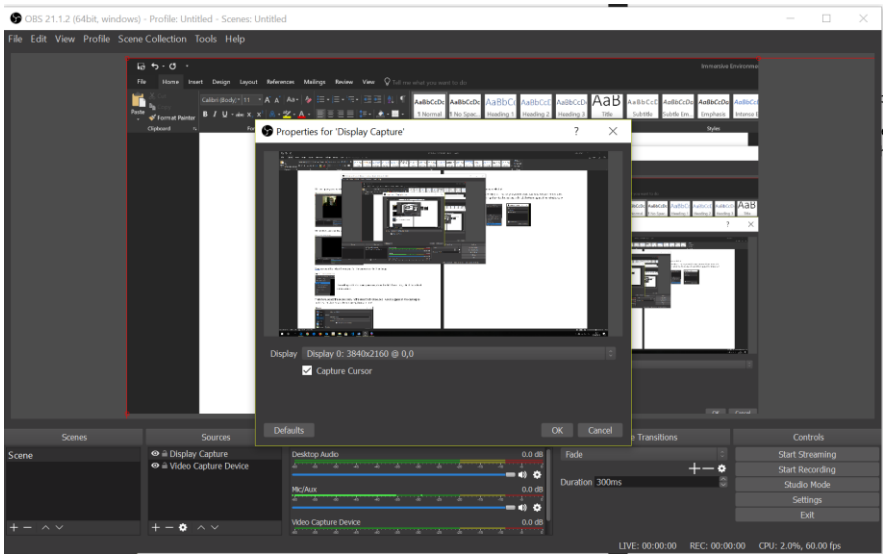
Once all this is done, you can select ok.

Now, before we start recording, just in case you want to know, you can add your screen to this output as well. To do this, go back to the sources and click the + icon again. Then select display capture.

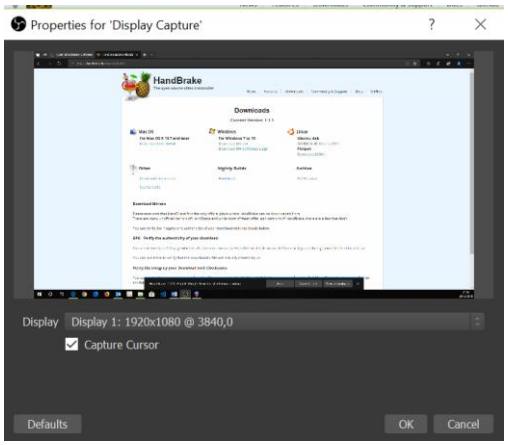




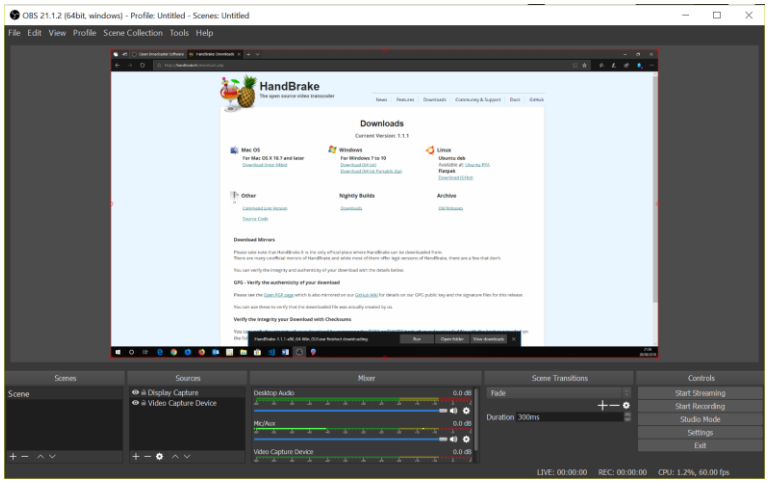
You should end up seeing something like this:



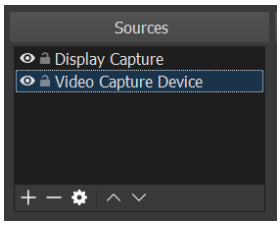
An inception of OBS, things to note on a single screen device there should be no issues, the machine I am writing this on has two monitors, one at 4k the other at 1920, OBS records better on the 1920 screen, so in the drop down, I will change from display 0 to display 1.



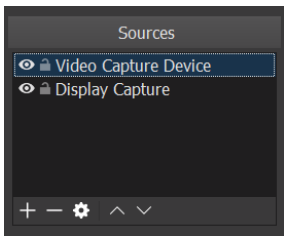
Once this is done, you should see the following



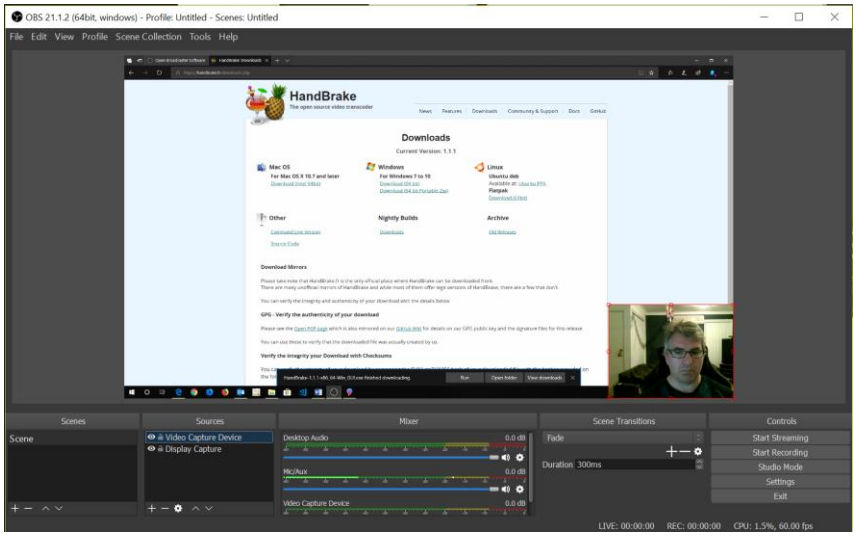
Notice how the webcam is no longer visible. To fix this, we move the position of the sources.



Change to



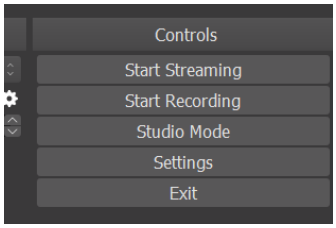
This then creates the following



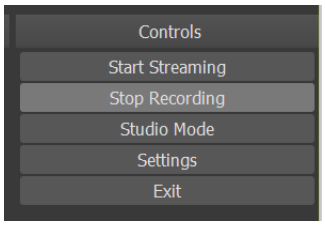
In this way, if you want to discuss your project as well as maintain the exam requirement of recording yourself, you can have both elements on the screen.

Now that the base setup is done. We can start recording.

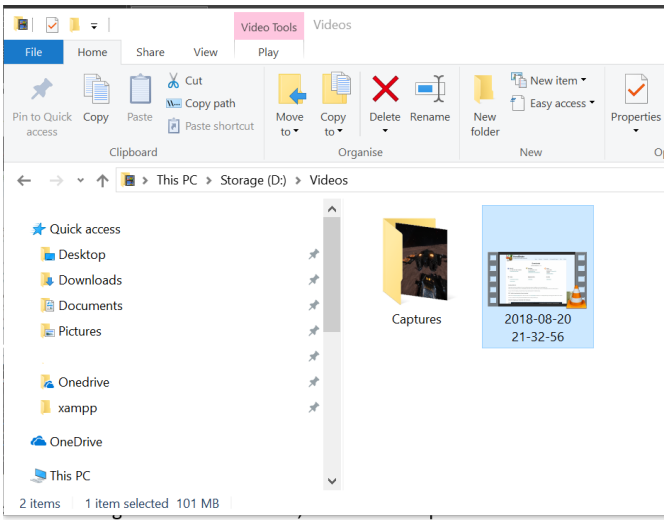
On the right hand side, click start recording.



Once you have finished recording, then just click on stop recording.

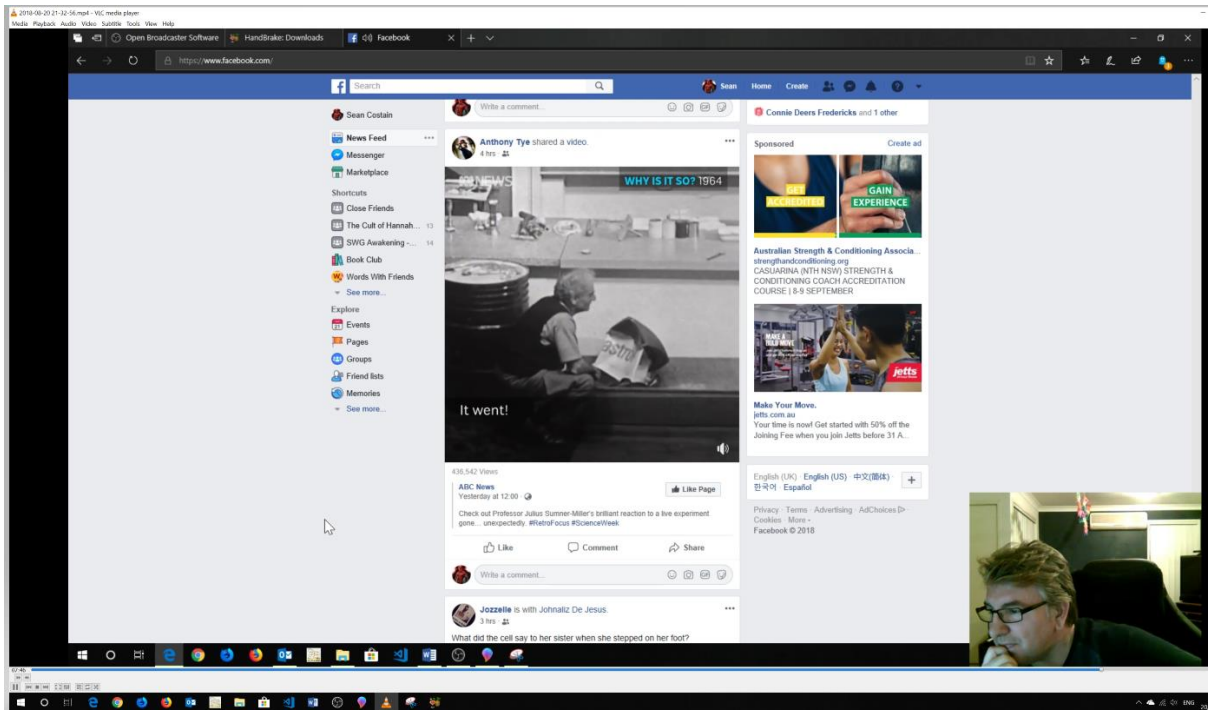


I'm going to create an 8-minute recording and then click stop, just so you can get an idea of the file size.



As you can see, the 8-minute video is 101Mb in size.

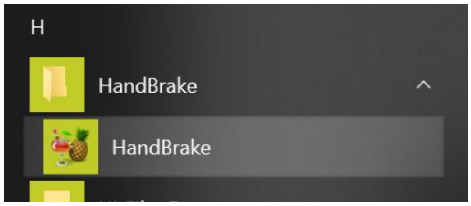
Once you have made a video, test it, make sure the audio worked and that the content you wanted to capture is there.



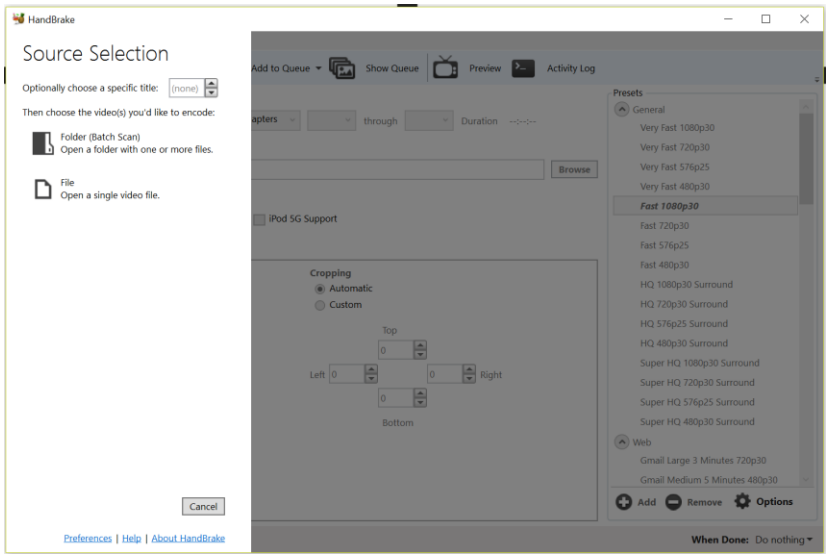
In this case, yes I spent the 8 minutes scrolling through Facebook. Remember, on my machine, my recorded screen is a second screen, hence the head turn.

From here, we are going to now swap to handbrake to shrink the file more.

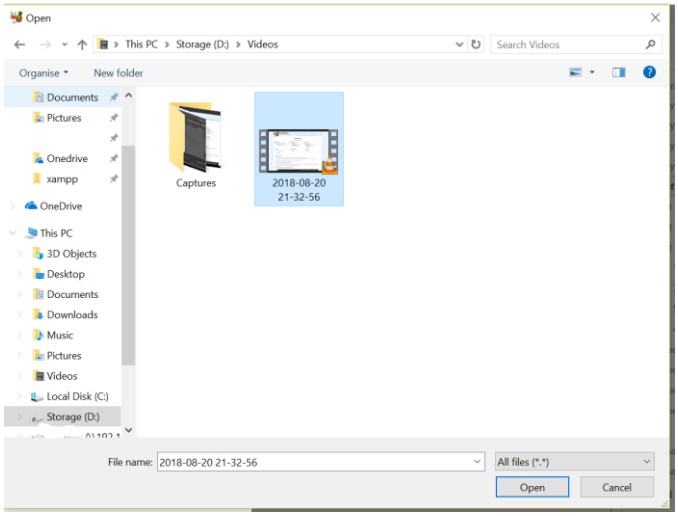
Load up Handbrake



You should be presented with the following screen



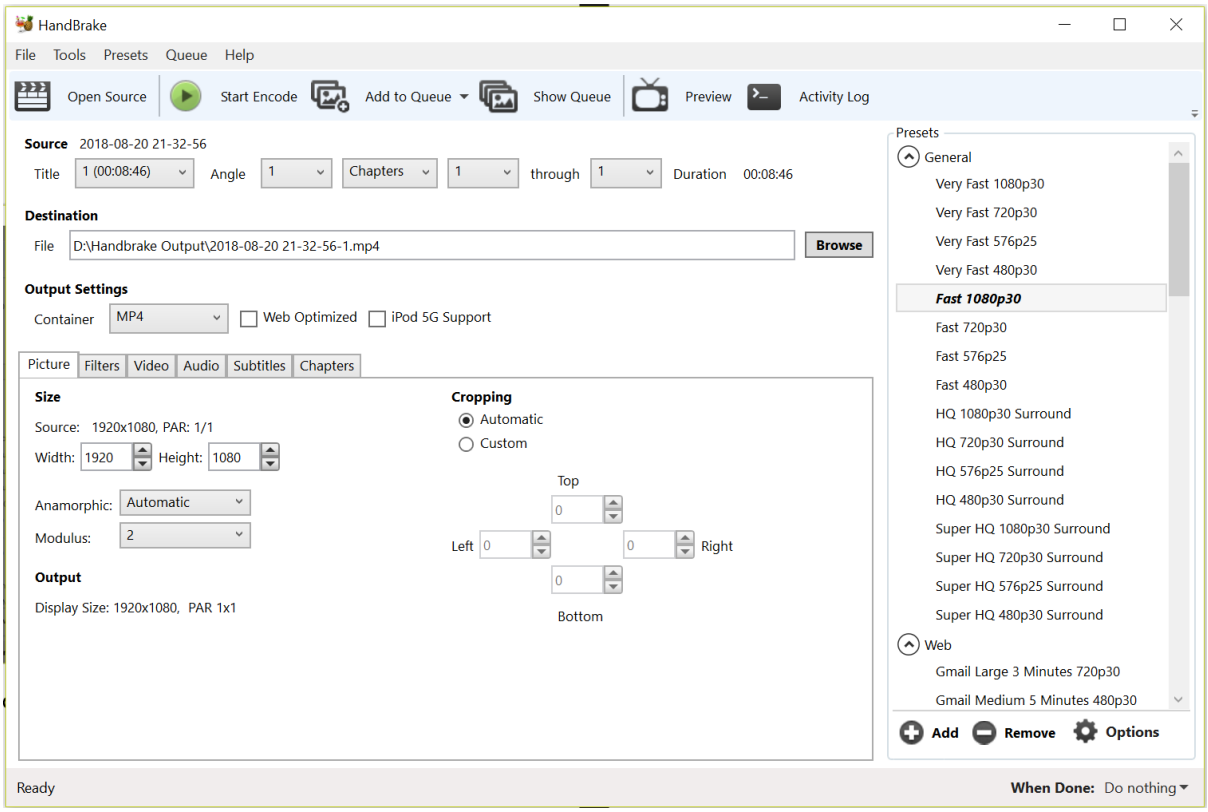
From here, select File, then locate the video you just created. And click open



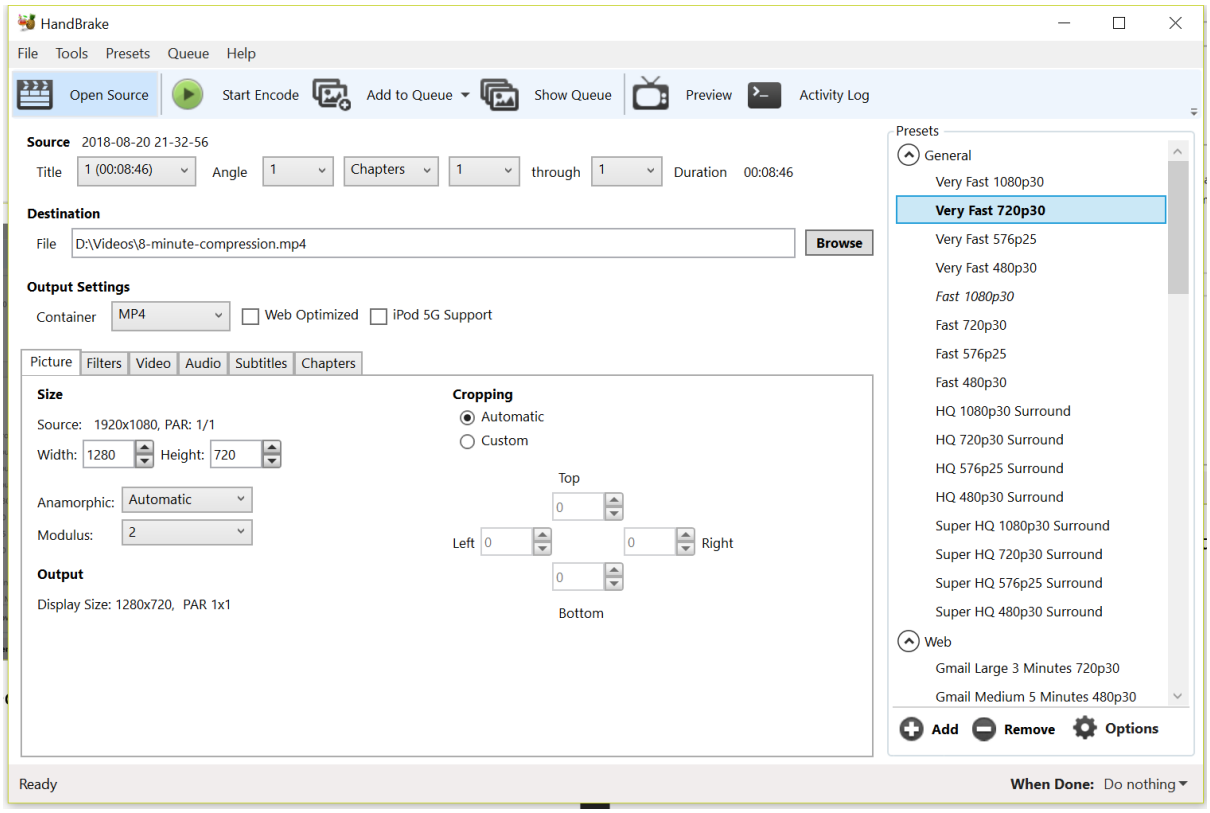
From here, the system looks a little confusing, but it's pretty easy to work with. The flow is, select the destination folder, select the file type of output, add to queue and then start queue.

The reason you can have a queue, is that you can encode folders full of video content, so you aren't restricted to only dealing with one video.

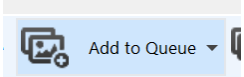
You should see the following screen.



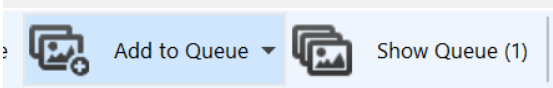
From here, I'm going to change the destination folder to be the videos folder and change the name, I'll also downgrade the presets to Very Fast 720. So, it looks like this:



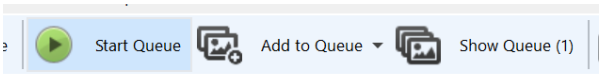
Next, click on Add to queue



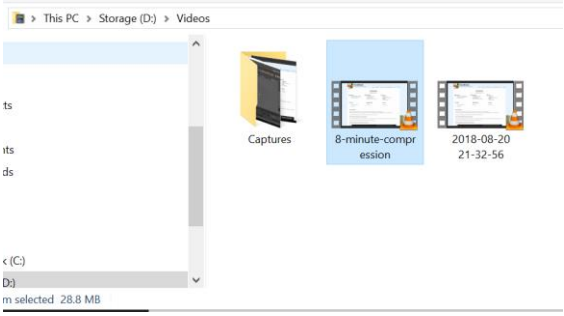
You should then see a number appear next to show queue



This tells you how many videos you have ready to encode, in this case just the one. And click on Start Encode.



Once it has finished, the file ended up at 28Mb;



Before submitting, always reload and watch the video again, ensure that the quality is what you expected.