

## 3D modelling exercise with Sketchup Make

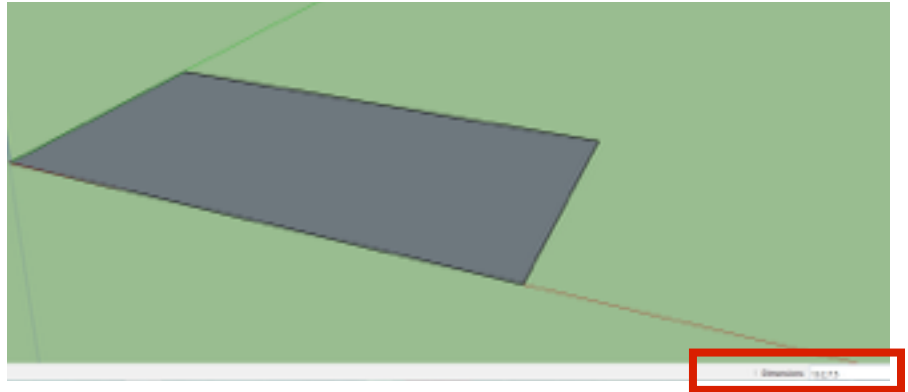
Valeria Vitale, University of London

### Drawing the base

1) Select the rectangle tool and draw any rectangle.

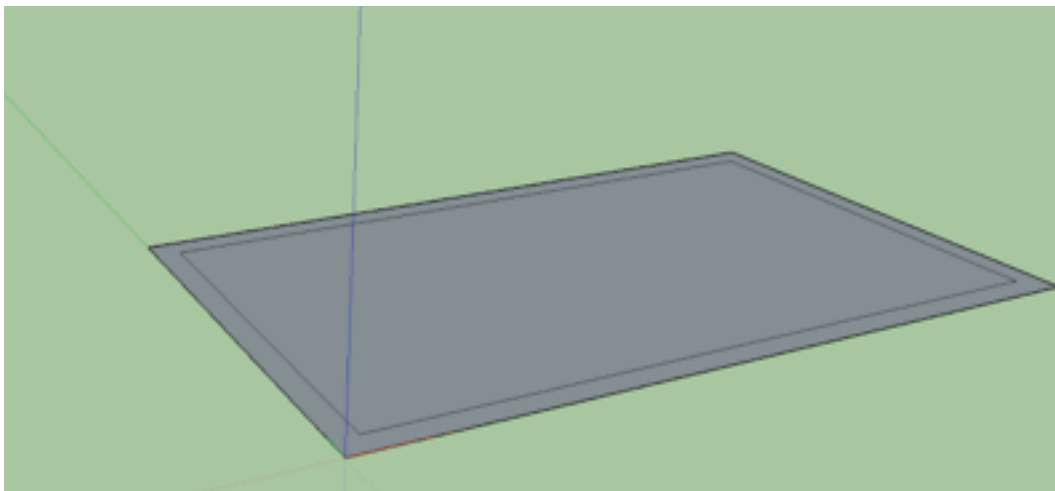
2) Without clicking outside the rectangle, type the following measurements: 13.2, 7.5. Don't click in the measurement box, just start typing and you'll see the numbers

appear. Press enter and your rectangle will be modified according to the manually entered values.



### Building the external walls

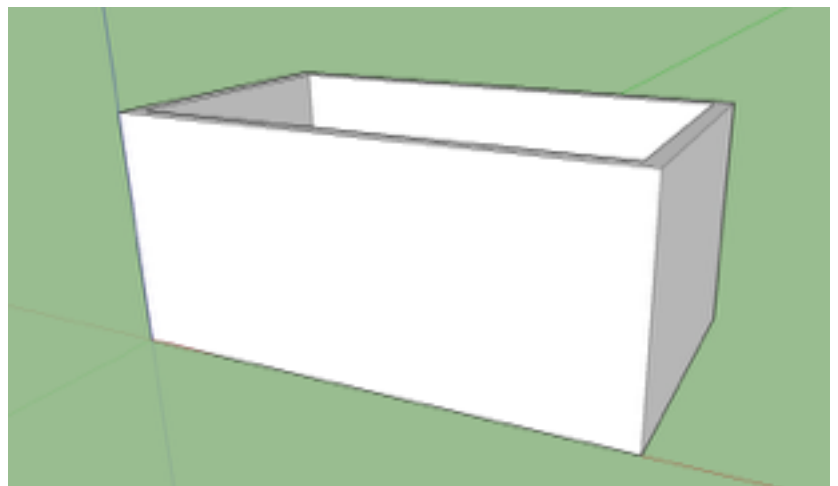
3) Select the offset tool, and click and drag inside the rectangle.



4) When the area of the rectangle is highlighted, apply offset creating a smaller internal rectangle. Enter 0.44 to create a precise offset.

5) Select the push-pull tool and start extruding the outer rectangle. Type the value 6 and press enter.

### Drawing guidelines:



6) From the main menu select Camera/Standard Views/Front

7) Select the tape tool. Click on the line on the left to create a guide and drag it in any place. Enter 0.73.

8) Repeat for the following values:

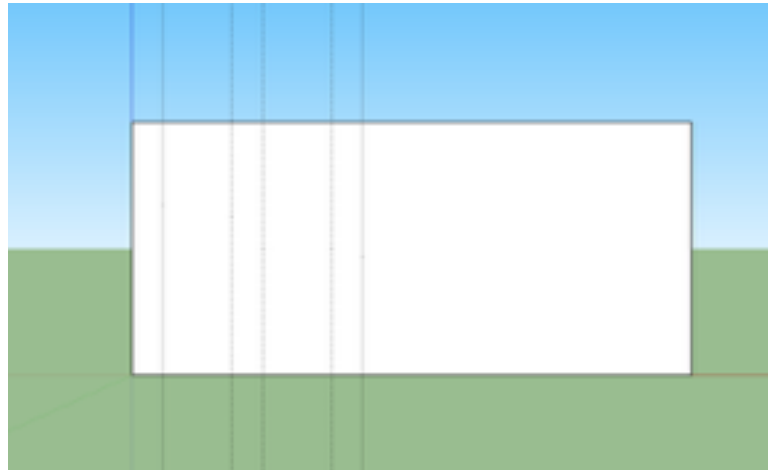
2.35

3.08

4.7

5.43

You should now have 5 vertical guides

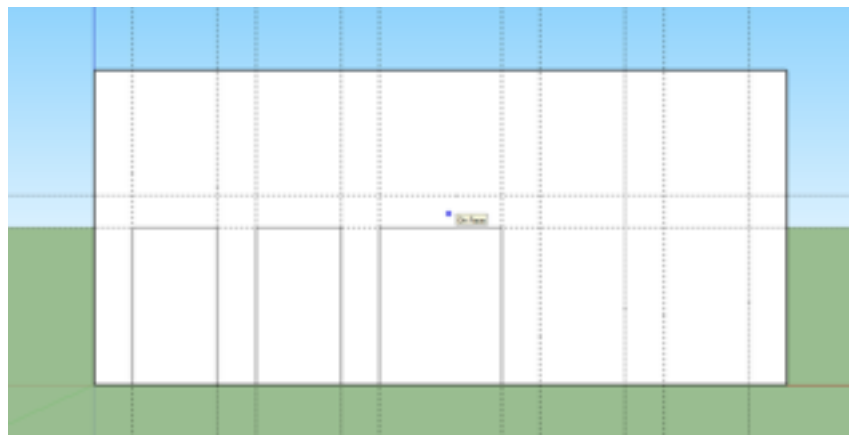


10) Repeat steps 7 and 8 starting from the right edge. At the end you should have 10 vertical guides.

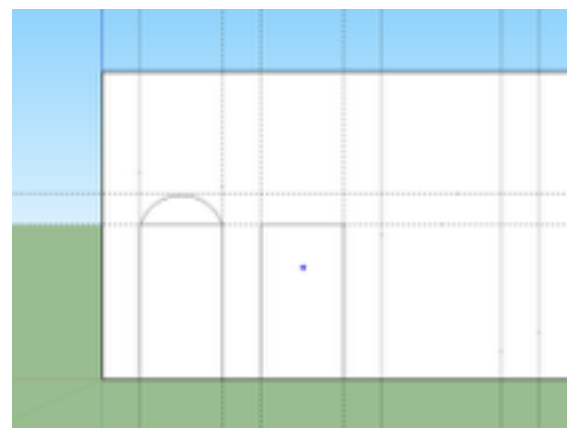
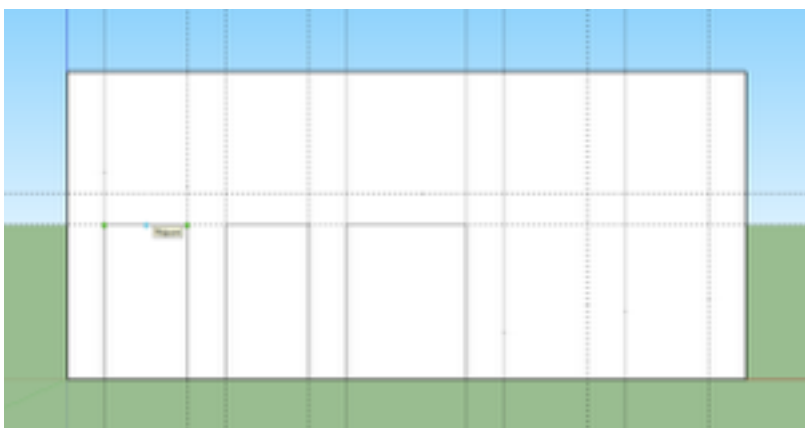
11) Following the same procedure, create two more guides starting from the lower edge. Enter 3 for the first and 3.6 for the second.

### Drawing the arched doors

12) Select the rectangle tool and draw 3 rectangles at the intersections of the guides. The tool should automatically snap at the intersection points (you should visualise a red x when those points are selected)



13) Select the arc tool. Position the cursor on the upper edge of the first rectangle. Click on the upper left corner of the rectangle and release the button. Repeat for the upper right one. Follow the upper edge with the cursor until you visualise the midpoint. Then move the cursor vertically until you meet the next horizontal guide.



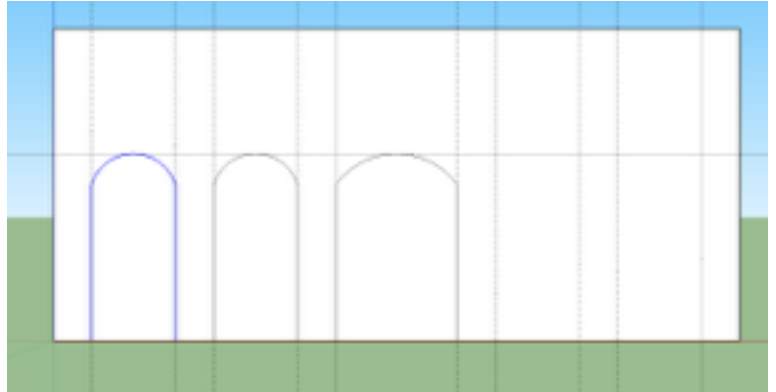
14) Repeat for the following 2 rectangles

15) Select the eraser tool and click on the upper edge of the rectangle/lower edge of the arc. You should now have an arched door. Repeat twice.

### **Duplicate first two doors**

16) On the first arch, select the two sides and the curved top (3 lines). Use control (PC) or shift (MAC) to allow multiple selection.

17) Select the move tool. Click the control (PC) or alt (MAC) button while you drag the arch on the right side of the wall, consistently with the position of the previous ones. You have copied the arch and moved the new copy.



18) Repeat for the final door

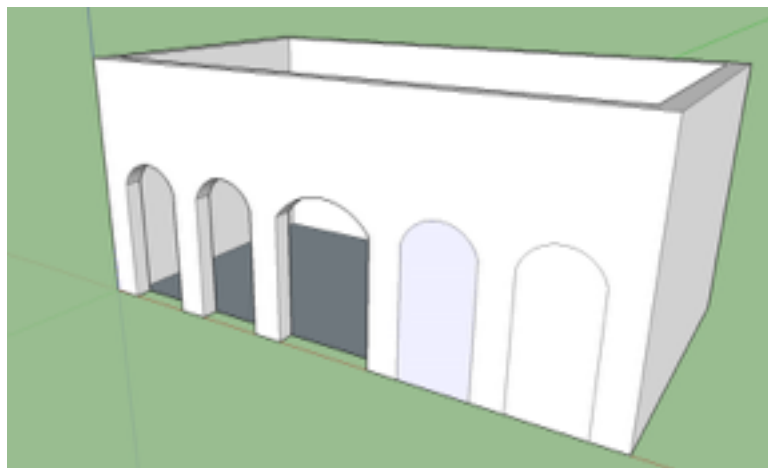
### **Delete guides**

19) Select Edit/Delete Guides

### **Creating the door openings**

20) Rotate the model to have a perspective view

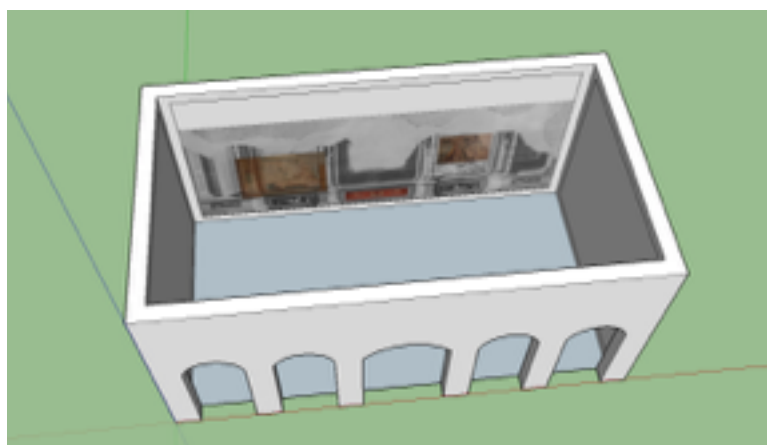
21) Select the push-pull tool and push area of the first arch towards the inside until it disappears. Double click on the other arches. The software will automatically apply the last value of the tool again.



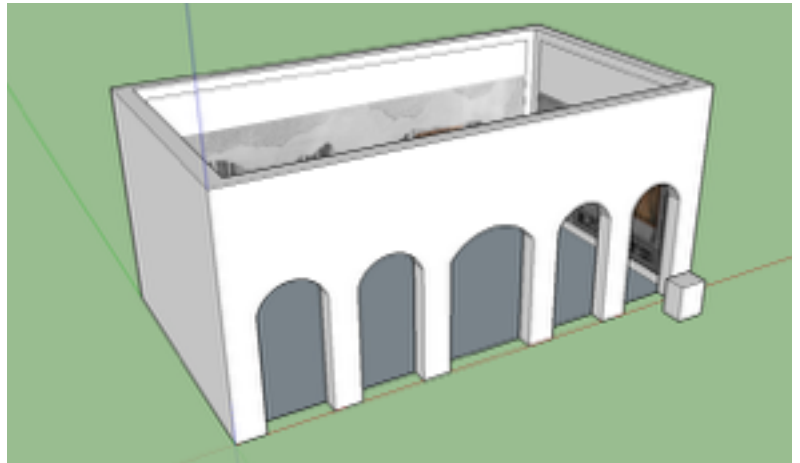
### **Adding textures to the walls**

22) Select one of the non-arched walls. Create an offset of 0.3. Repeat 3 times

23) Go to Edit/Import. From the "files of type" drop-down menu, select "All supported Image Types", then browse the folder where you saved the image files we provided. Select the appropriate one (when looking at the arches, the walls are, respectively, from left to right: south, west, north)

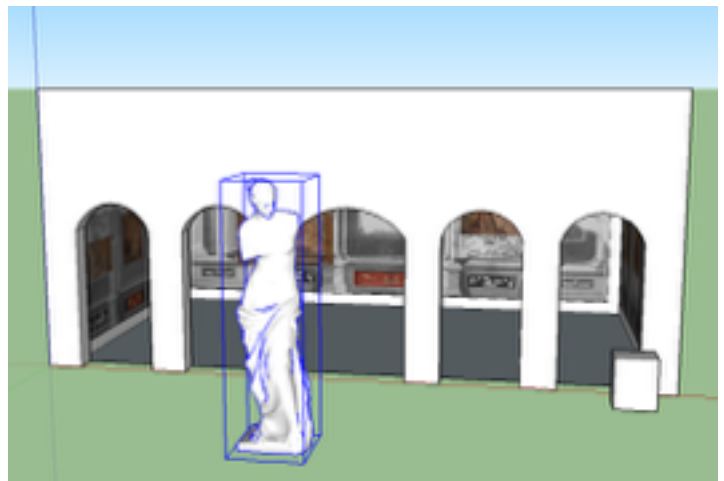


24) Once you click “open” you’ll see a preview of the image you selected, attached to the cursor. Click on the lower left corner of the inner rectangle created with the offset. Then on any point on the right edge of the same rectangle. The image will follow the cursor and adapt to the dimensions of the selected area. Repeat for the other two images.



24 bis) (Only if you want to upload your model to the Sketchfab platform. Feel free to ignore otherwise and move to step 25)

If we want our textures to show in Sketchfab, we have to separate them from the surfaces they are covering, to avoid errors in the Sketchfab visualisation. Select one of the images we have just positioned on the wall, then choose the move tool. Start moving the image slightly away from the surface it is texturing. Be sure that you are moving it on the right axis. Enter the value 0.02. Repeat for all the three images.



### **Adding stock 3D object**

25) Select the rectangle tool and draw a rectangle near the right side of the last arch on the right. It is not important exactly where you put it (use the image as reference). Enter the values: 0.8, 0.6

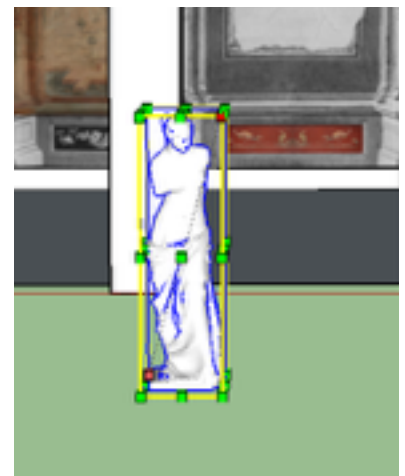
26) Select the push-pull tool and extrude the surface. Enter 0.8 as value.

27) From the main menu, go to windows/components

28) A dialogue box has now appeared on your screen. In the search field type “ancient statue” and press enter.

29) Click on the icon of the Venus of Milo and wait until the download is complete. Then close the window.

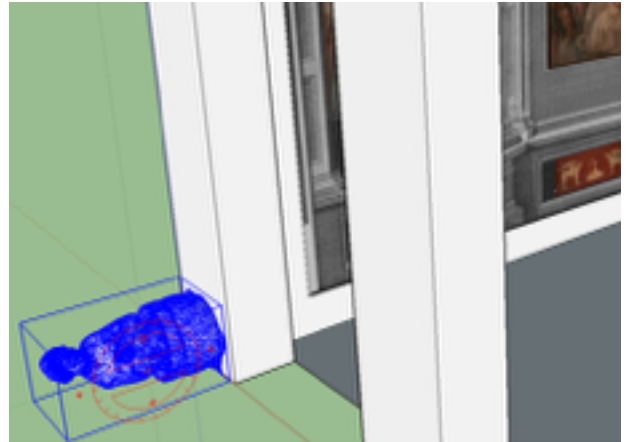
30) The statue should be now connected to your cursor. Click to make it independent (you see a blue box around it).



31) Select the scale tool. All the vertexes of the blue binding box are now green cubes. Select the one at the top right corner and start dragging it. You are now scaling the statue uniformly. Enter the value 0.5. The statue is now half the size it was when we downloaded it.

32) Select the move tool and place the statue on the pedestal you have just created.

33) Take some time to look at the model. Then decide where you want to place the pedestal to support the 3D model created in the previous exercise. Decide how large, wide and high it has to be.



### Importing your 3D object

34) From the main menu select File/Import. This time select from the types menu "collada files". Find the file from your previous exercise and open it. Wait for the download to be completed.

35) The file is now attached to your cursor. It is very likely to appear near the origin point (where the three axes intersect) and to be very, very small. Click to separate the mesh from the cursor and then select the scale tool.



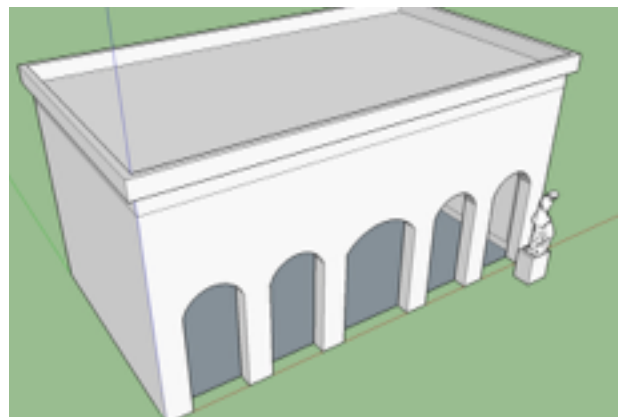
36) Using the uniform scaling option (click and drag one of the corners of the binding box) enlarge it enough to bring it to scale. Then move it to the top of the pedestal you created. If you need to rotate the artefact, with the move tool selected, bring the cursor over one of the red crosses you see on each face, until a circle appears. If you click and drag you're now rotating the object. You can do it manually or enter an angle value and press enter.

### Building the cornice

37) Select Camera/Standard views/Left

38) Select the rectangle tool and draw a rectangle on top of the building. Enter the values 7.5,0.5

39) Select the push-pull tool and extrude the rectangle 13.2. The building is now entirely covered.

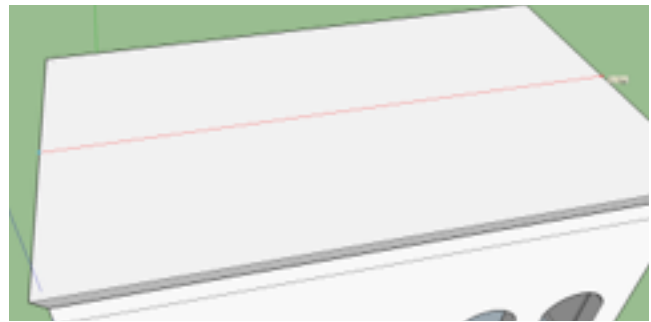


40) Select the offset tool and create an outer rectangle of the top surface. Enter the value 0.2

41) Extrude the outer rectangle by 0.5

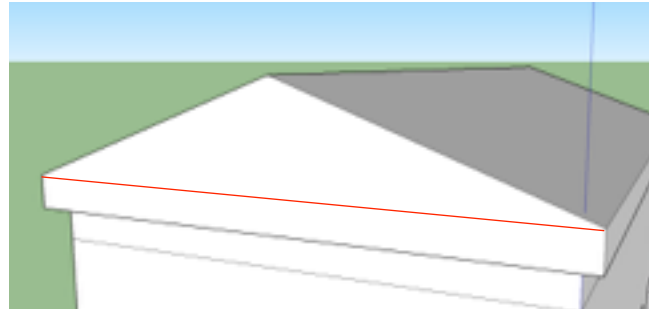
42) Double click the inner surface to make it even.

43) Select the eraser tool and delete the extra lines from the upper surface.

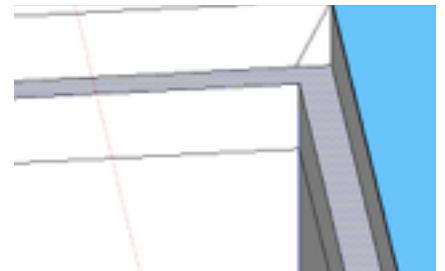


### **Raising the roof**

44) Select the pencil tool and move it along the edge until you see the mid point. Draw a line to the mid point on the opposite edge

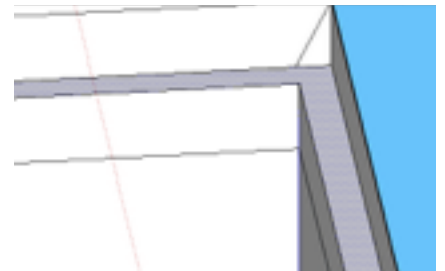


45) Select the line, pick the move tool and move the line up 1.5. Use the blue dotted line as a reference for moving elements vertically.



### **Cutting back the cornice**

46) Select the pencil tool and draw a line that joins the two vertices in the pediment, creating the base line of a triangle.



47) Go back to the left view, and also select "parallel projection".

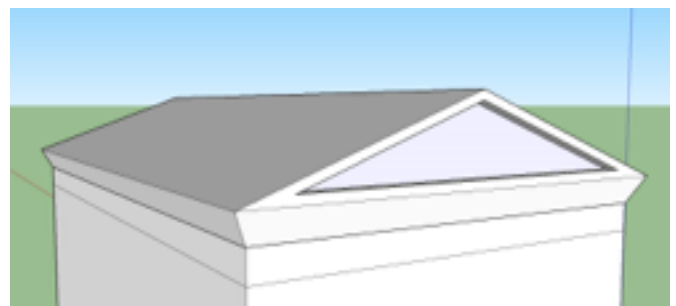


48) Select the pencil tool again, and draw a line joining the upper right corner of the second rectangle to the upper right corner of the first one.

49) Revert to perspective view.

50) Select the lower surface of the second rectangle.

51) Select the follow me tool, and double click on the triangle you drew previously. This is how your two elements should look now



### **Adding details to pediment**

52) Select the offset tool and create an inner line inside the pediment

53) Repeat on the other side, just by double clicking.

54) Select the push pull tool and push the inner surface inside by 0.15

55) Repeat on the other side.

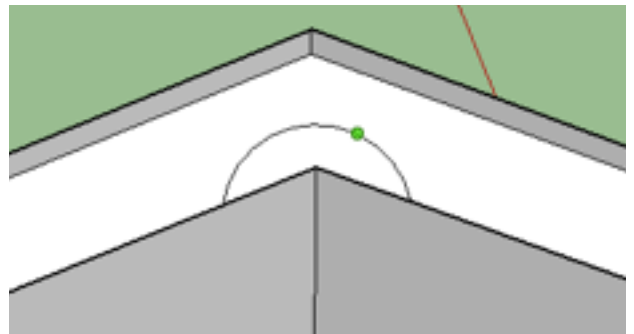
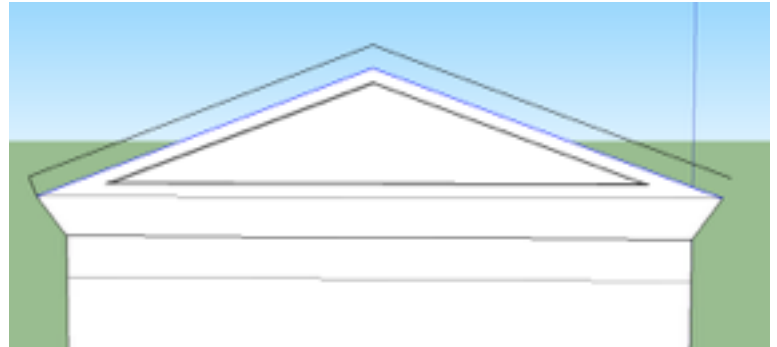
56) Select all the sides of the pediment but the base.

57) With the offset tool create a 0.2 external offset.

58) With the pencil tool, close the open edges

59) Push the offset back by 0.25

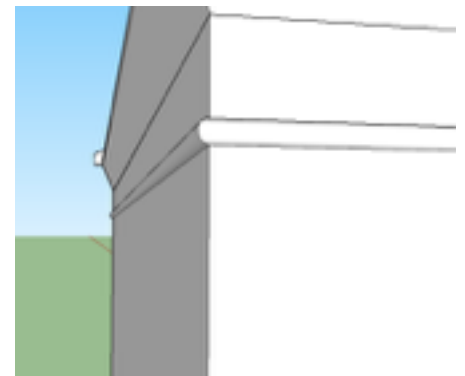
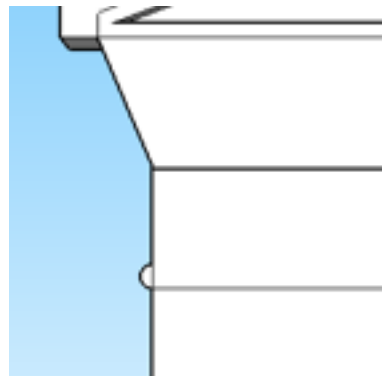
60) Repeat on the other side.



### **Adding roof ridge tile**

61) Draw an arch on the ridge of the roof to create a ridge tile.

62) Extrude it to the other end.



### **Adding a cornice moulding**

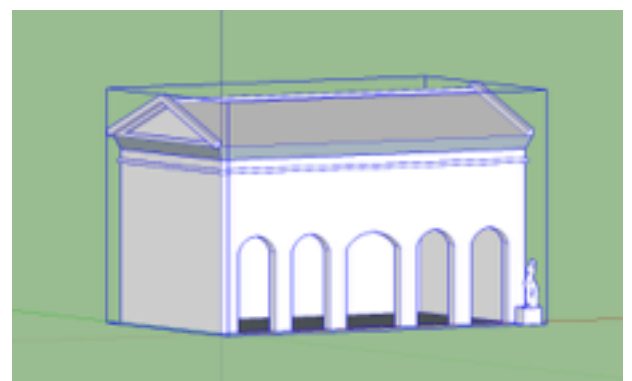
63) Select the left view.

64) With the arch tool, draw an arch on the side of the building (using the line on the wall as reference, as shown in the picture) to create a moulding

65) Select the horizontal line below the arch on all four walls (but none of the surfaces), then select the follow me tool and click on the arch's area. You should see the moulding go all around the building.

### **Grouping the elements**

66) Select all (Control+A in Windows and Command+A in MAC), then, from the menu "Edit", select "Make group". There is a blue box around all the elements: they are now a single entity that can be easily moved and rotated together.





### **Adding geographic information**

(You may want to skip these steps if you want to upload your model on Sketchfab)

67) From the menu “File”, select “Geo-location” and then “Add location”. In the text field type: Pompeii, Italy. You will see satellite images from Google Maps. Identify the Temple of Isis in the map (at the back of the large theatre, in the area shown in the screenshot), then click “Select region”.

68) Move the four pin icons at the corner of the selected region, until you have more or less the area shown in the screenshot. Then click “Grab”, in the top right corner of the window. The portion of Google map is now imported in your Sketchup model.



69) Move the model on its exact location (using the screenshot for reference): the scale is already consistent.

70) Go back to the “File” menu, select “Geo-location” and, this time, click “Show terrain”. You can now see the 3D model in the context of some rough, but still effective, terrain information .

**Now your exercise is finished! But you can keep adding details, textures or external objects. You can find more tutorials on the Sketchup website.**