Question 1: From the previous assignment, radiative heat transfer between two parallel plates.

Epsilon = 0.1
$Q_{12} = 1035.81 W/m^2$

$Q_{12\ N\ shield} = 1 / (N + 1)\ Q_{12}$

But $Q_{12\ N\ shield} = 1\ \% * 1035.81 = 10.3581$

$10.3581 = 1 / (N + 1)\ 1035.81 W/m^2$

$10.3581 / 1035.81 = 1 / (N + 1)$

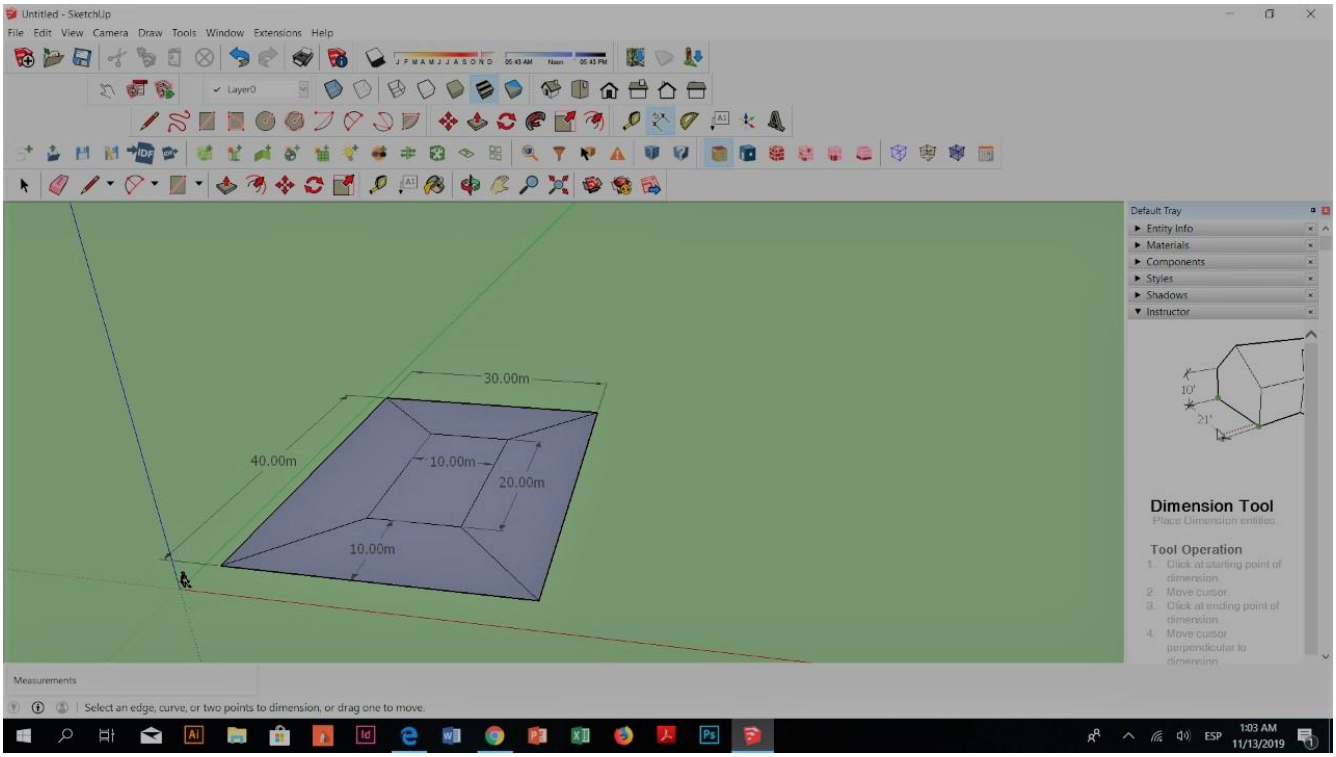
$N + 1 = 100$

$N = 99$

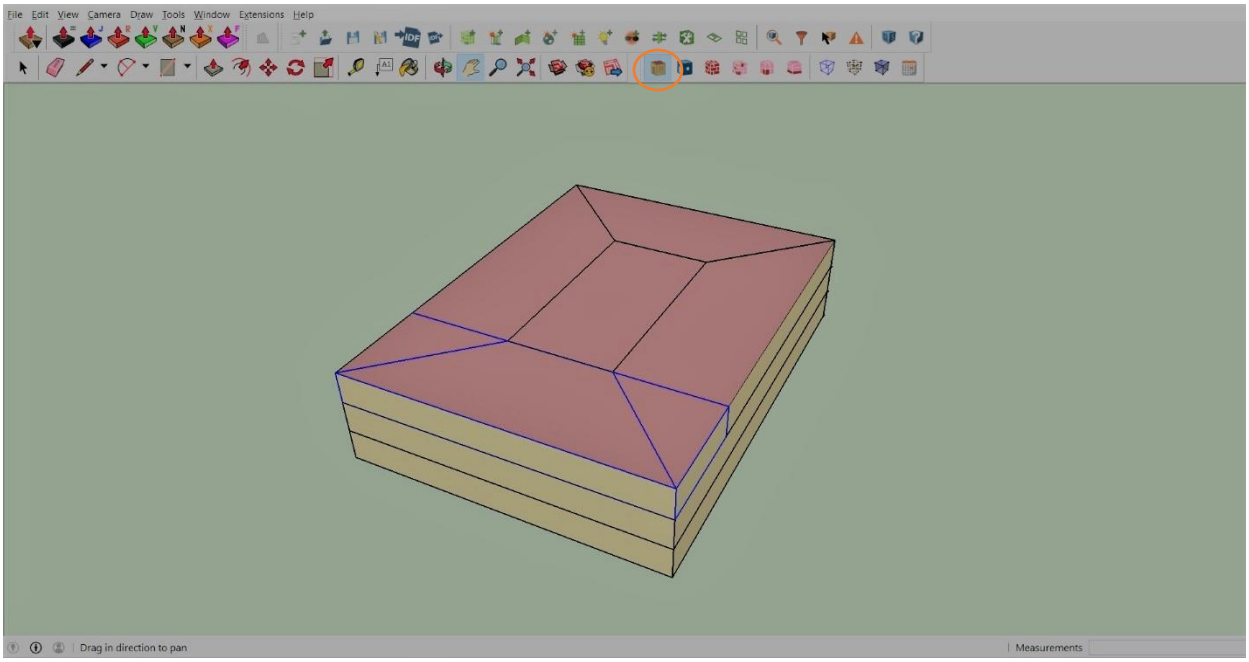
Therefore we need 99 surfaces to have the new heat transfer rate to 1%

Question 2

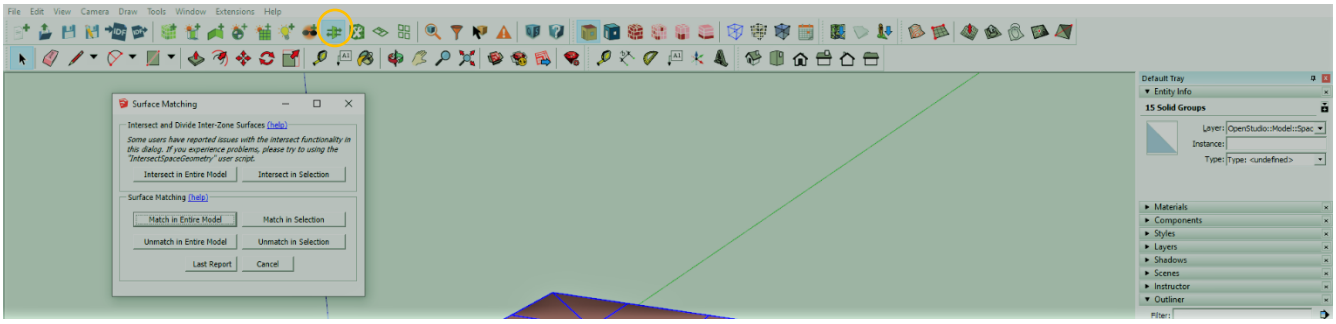
1. Draw a rectangle, with the given dimensions.

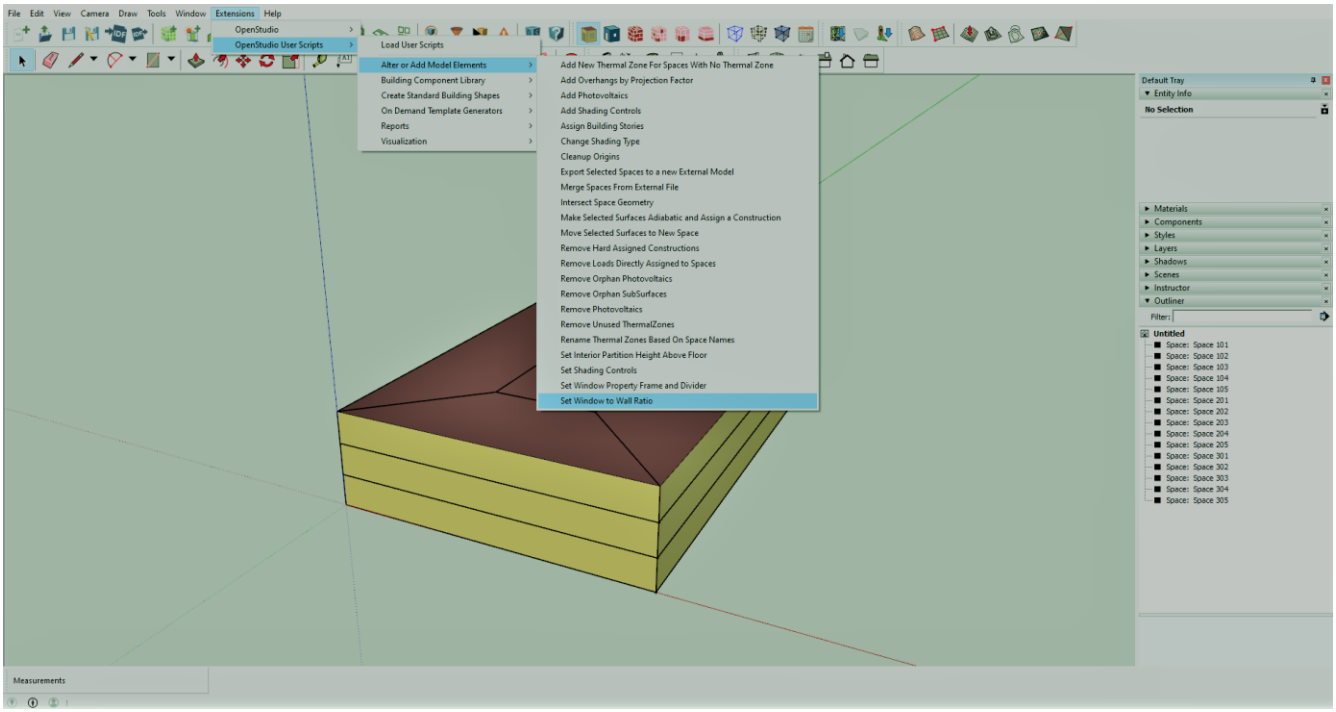


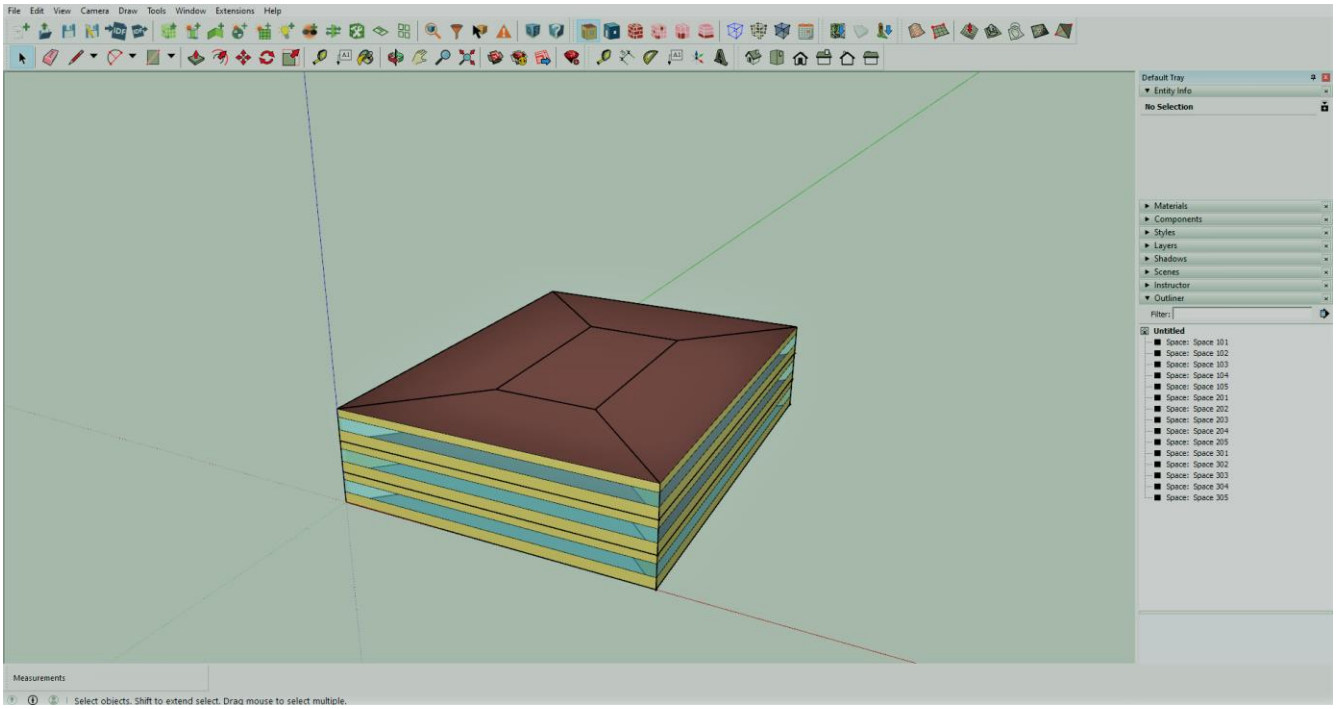
2. Click on ‘create spaces’ from diagram, select the desired of floors and height of building.



3. Click on ‘Surface match’ in order to be able to create windows and select ‘match the entire model”




File Edit View Camera Draw Tools Window Extensions Help
OpenStudio
OpenStudio User Scripts
Load User Scripts
Alter or Add Model Elements
Building Component Library
Create Standard Building Shapes
On Demand Template Generators
Reports
Visualization
Add New Thermal Zone For Spaces With No Thermal Zone
Add Overhangs by Projection Factor
Add Photovoltaics
Add Shading Controls
Assign Building Stories
Change Shading Type
Cleanup Origins
Export Selected Spaces to a new External Model
Merge Spaces From External File
Intersect Space Geometry
Make Selected Surfaces Adiabatic and Assign a Construction
Move Selected Surfaces to New Space
Remove Hard Assigned Constructions
Remove Loads Directly Assigned to Spaces
Remove Orphan Photovoltaics
Remove Orphan SubSurfaces
Remove Photovoltaics
Remove Unused ThermalZones
Rename Thermal Zones Based On Space Names
Set Interior Partition Height Above Floor
Set Shading Controls
Set Window Property Frame and Divider
Set Window to Wall Ratio
Default Tray
Entity Info
No Selection
Materials
Components
Styles
Layers
Shadows
Scenes
Instructor
Outliner
Filter:
Untitled
Space: Space 101
Space: Space 102
Space: Space 103
Space: Space 104
Space: Space 105
Space: Space 201
Space: Space 202
Space: Space 203
Space: Space 204
Space: Space 205
Space: Space 301
Space: Space 302
Space: Space 303
Space: Space 304
Space: Space 305
Measurements


File Edit View Camera Draw Tools Window Extensions Help
Default Tray
Entity Info
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Space: Space 201
Space: Space 202
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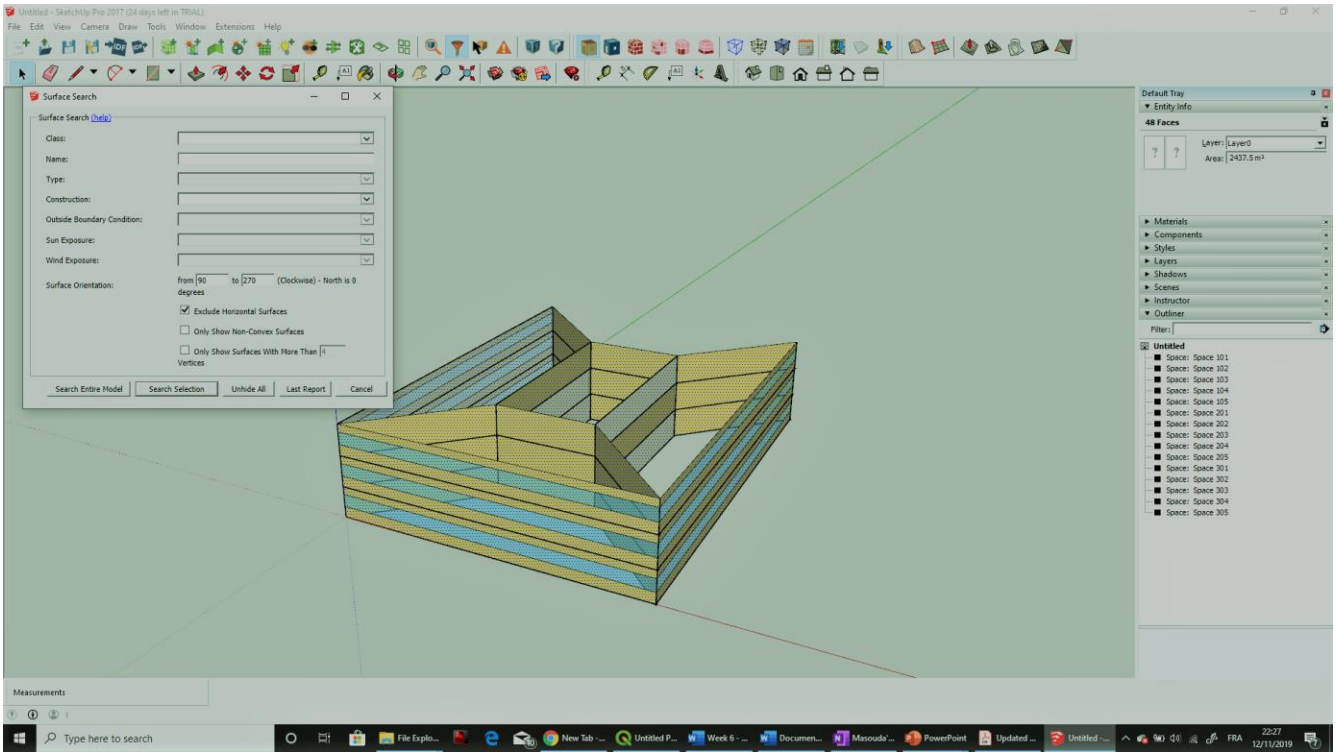
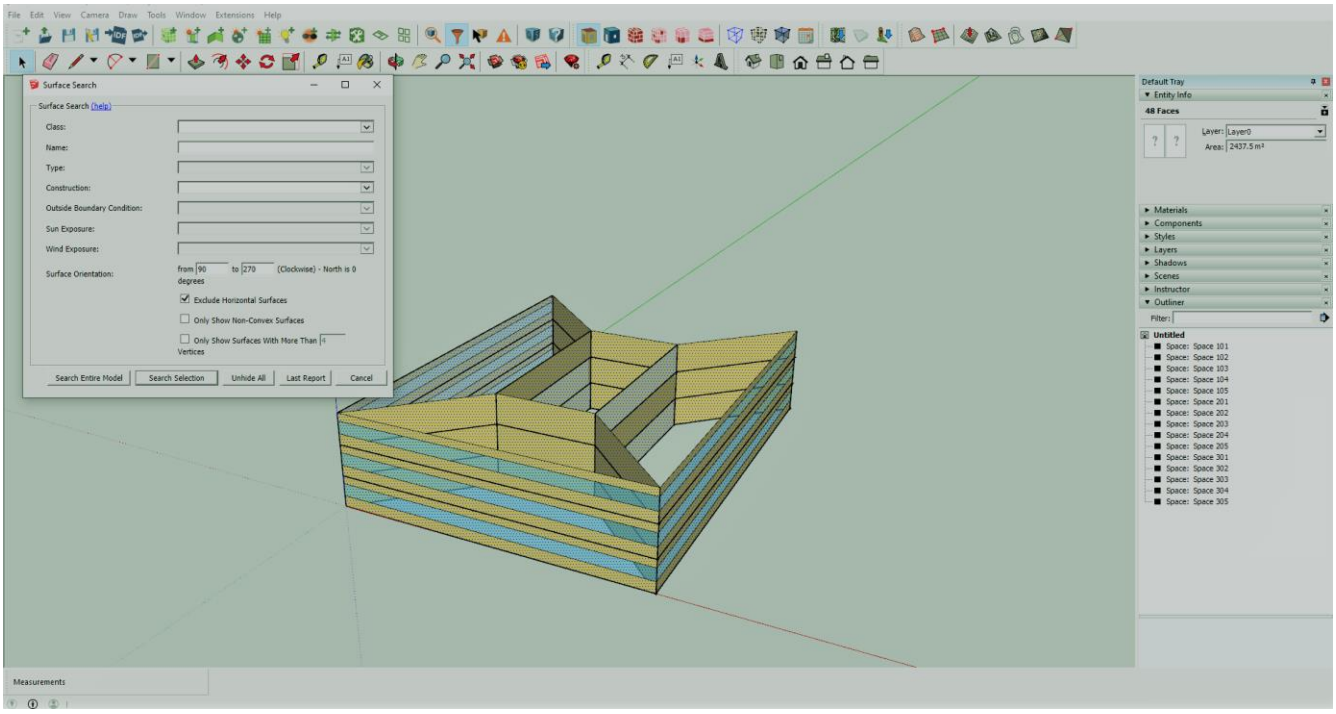
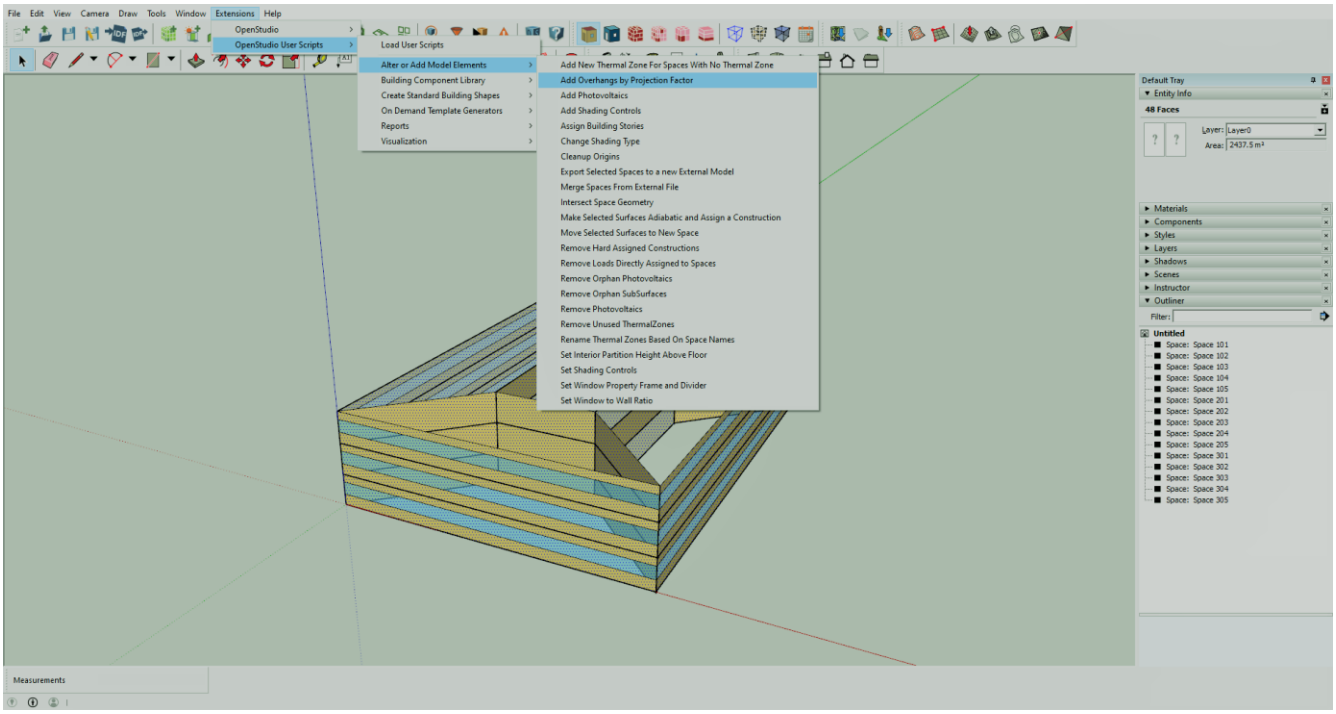
Space: Space 204
Space: Space 205
Space: Space 301
Space: Space 302
Space: Space 303
Space: Space 304
Space: Space 305
Measurements
Select objects. Shift to extend select. Drag mouse to select multiple.

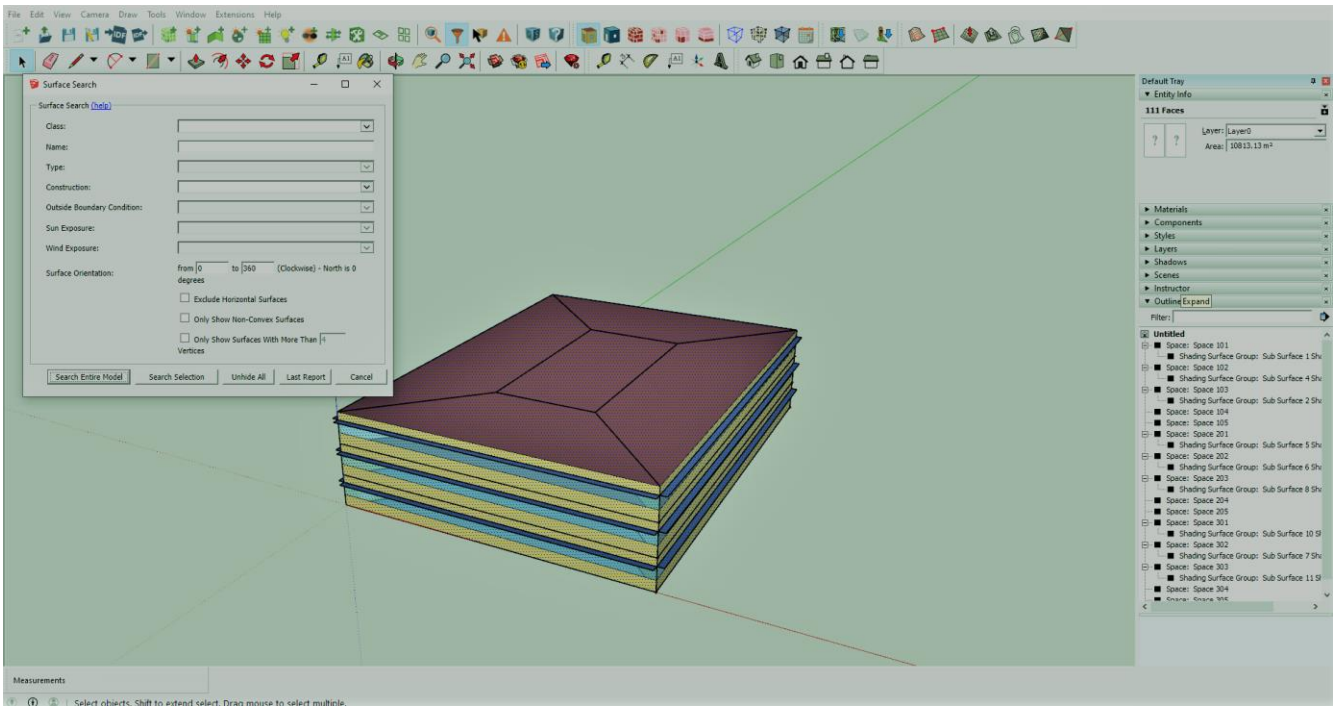
4. With search surfaces, select all the facades apart from the northern façade for shading.



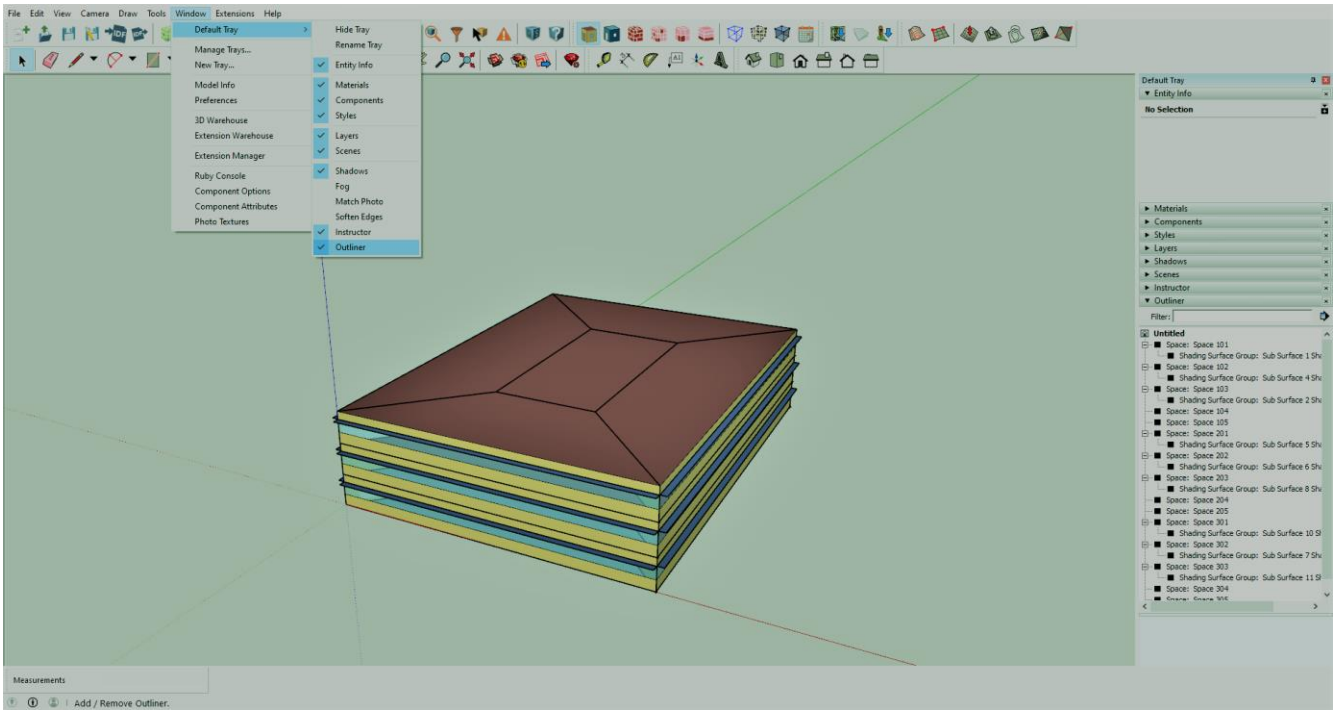


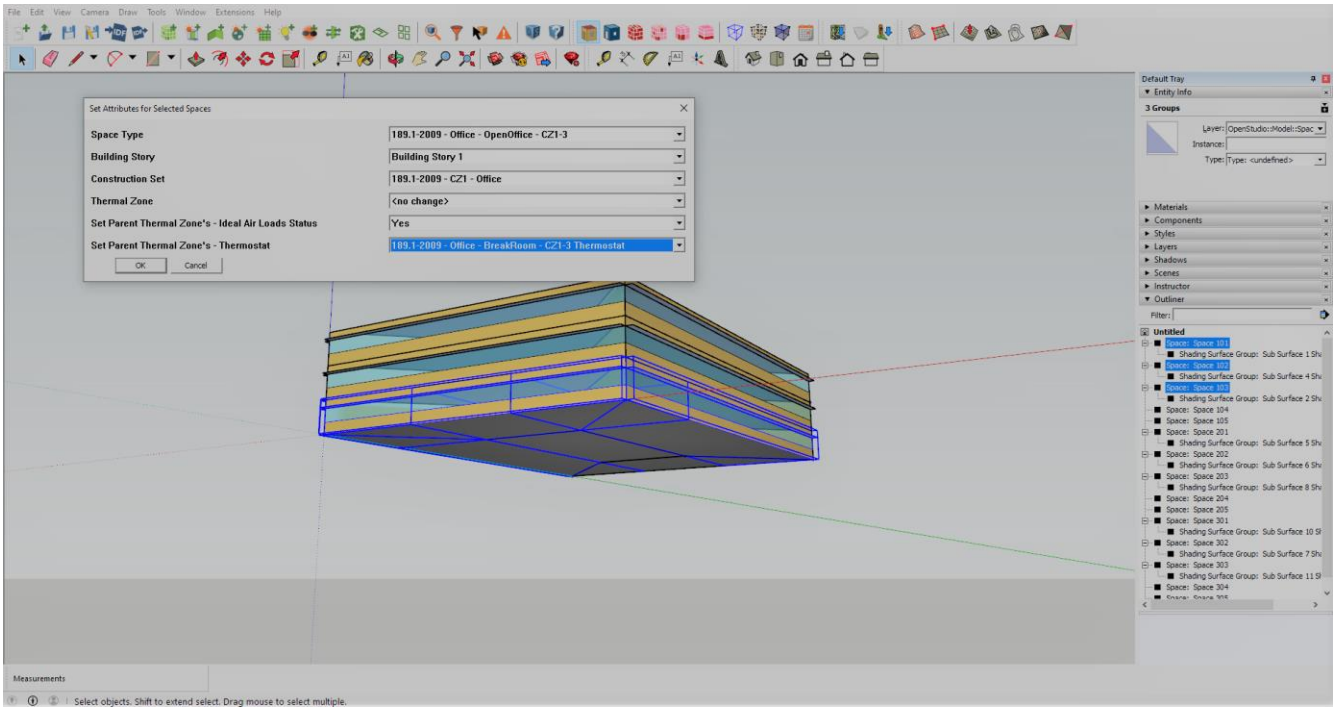
5. Using extensions, click ‘add overhang’ to add an overhang to the building.





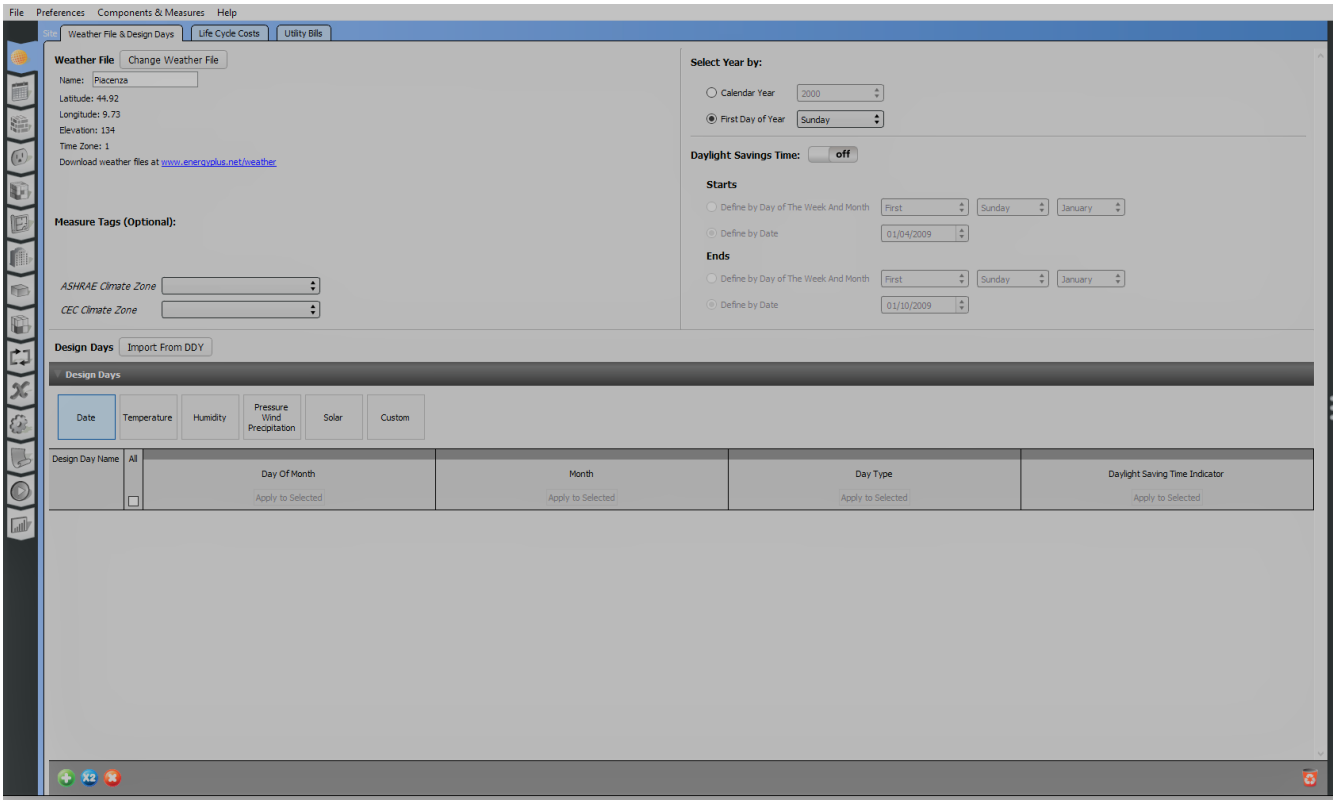
6.Select the surfaces apart from the horizontal surface, activate the ‘outliner’ and set the attributes on all the floors.

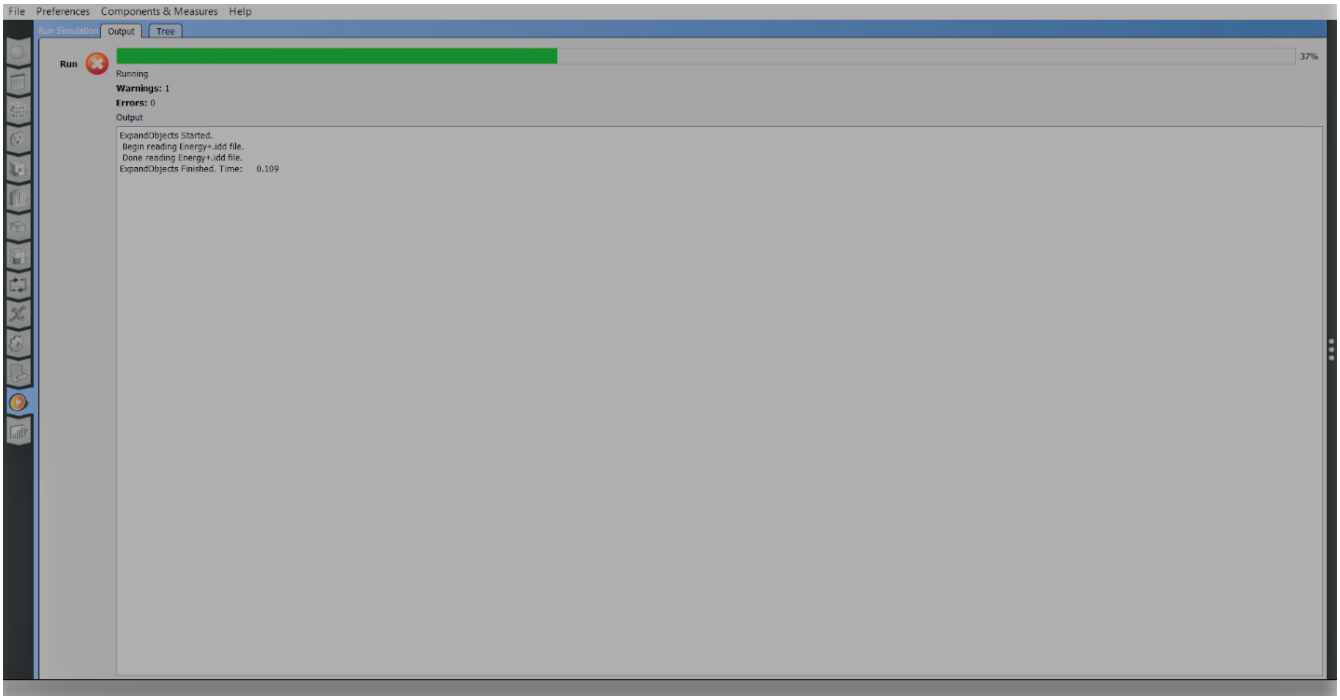




7. Save the Open studio model from sketchup.

8. Import the weather of piacenza and run the model.





9.Check the table for energy results.