Week6_ KKAZAN

13 Kasım 2019 Çarşamba
07:51

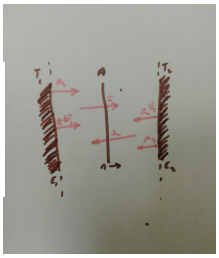
QUESTION 1:

A_1=1.5 m2 , F_{12} = 0.01 , T_1 = 298 K , T_2 = 308 K ,
ε_1 = 0.1 , ε_2 = 0.1, $\varepsilon_{3,1}$ = 0.1 $\varepsilon_{3,2}$ = 0.1
σ = 5.67 * 10^{-8} W/M^{2}k^4

Considering the same example you solved in the previous assignment (radiative heat transfer between two parallel plates), how many shields with epsilon = 0.1 should you add in order to have the new heat transfer to be 1% of the case without shields?

Q =(A σ * (T_1^4 - T_2^4)) / ((1/ ε_1 + 1/ ε_2 - 1) + (1/ ε1 + 1/ ε2 - 1))

$$\dot{Q}_{12,N\,\text{shields}} = \frac{A\sigma(T_1^4 - T_2^4)}{\left(\frac{1}{\varepsilon_1} + \frac{1}{\varepsilon_2} - 1\right) + \left(\frac{1}{\varepsilon_{3,1}} + \frac{1}{\varepsilon_{3,2}} - 1\right) + \cdots + \left(\frac{1}{\varepsilon_{N,1}} + \frac{1}{\varepsilon_{N,2}} - 1\right)}$$



Since all surfaces have equal epsilon values, we can use this formula.;

$$\dot{Q}_{12,N\,\text{shields}} = \frac{A\sigma(T_1^4 - T_2^4)}{(N+1)\left(\frac{1}{\varepsilon} + \frac{1}{\varepsilon} - 1\right)} = \frac{1}{N+1}\dot{Q}_{12,\text{no shield}}$$

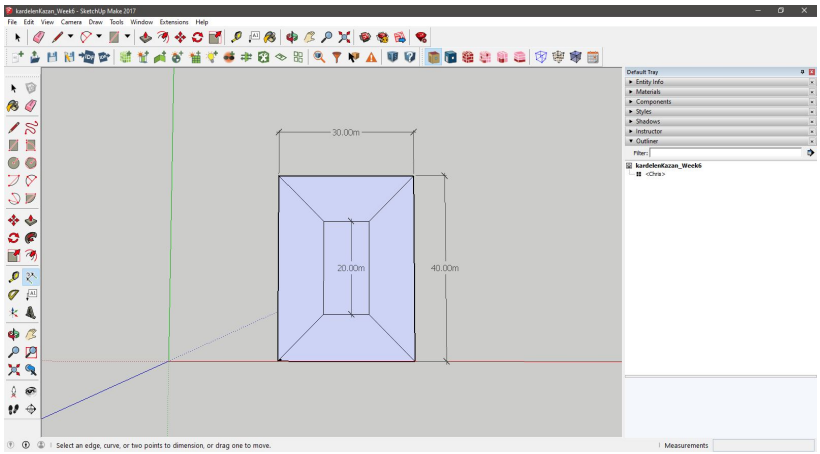
So ; 1/ N+1 = 1/100

N=99

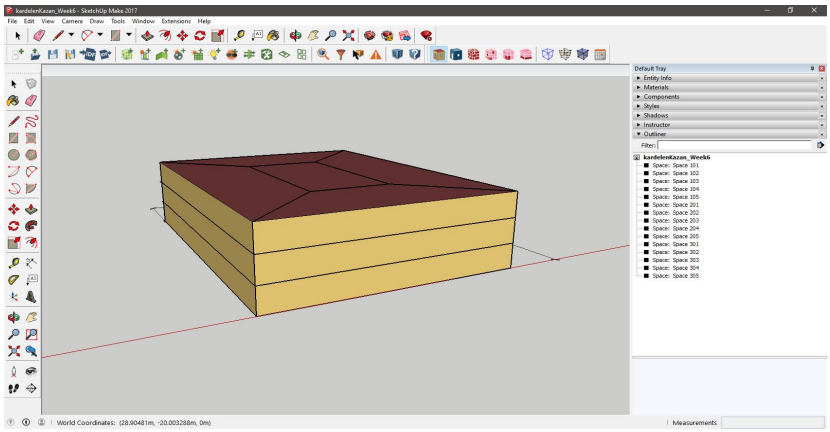
According to calculation ;you have to add 99 shields in order to have the new heat transfer rate to be 1% of the case without shields.

QUESTION 2:

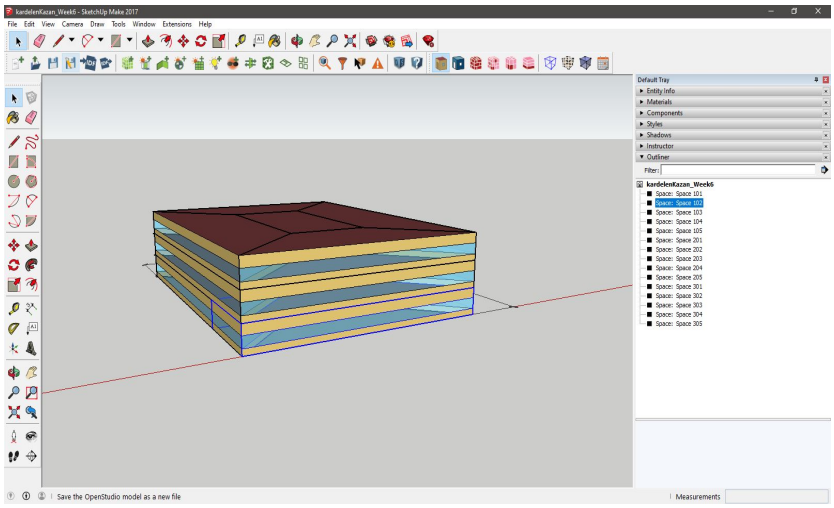
STEP1: you create diagram of an office building with 40 m x 30m



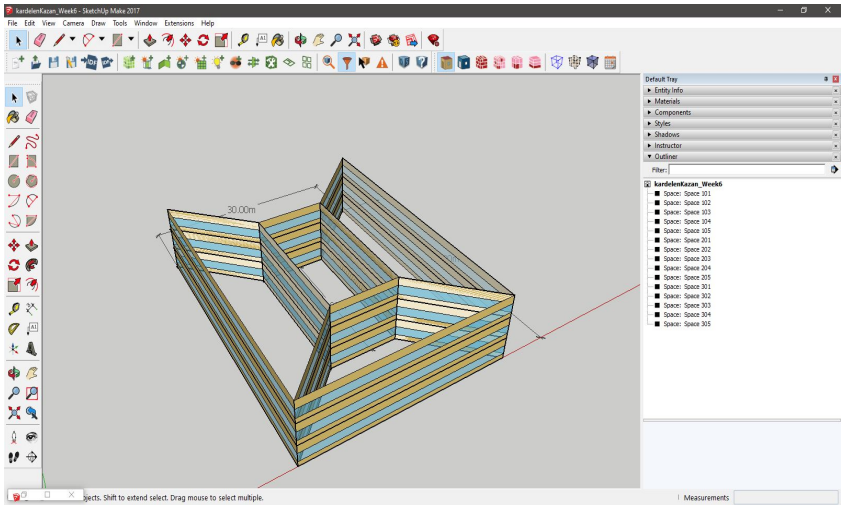
STEP2: to create levels of the model ,Use the "create space from diagram" tool, give the level heigh and level number.



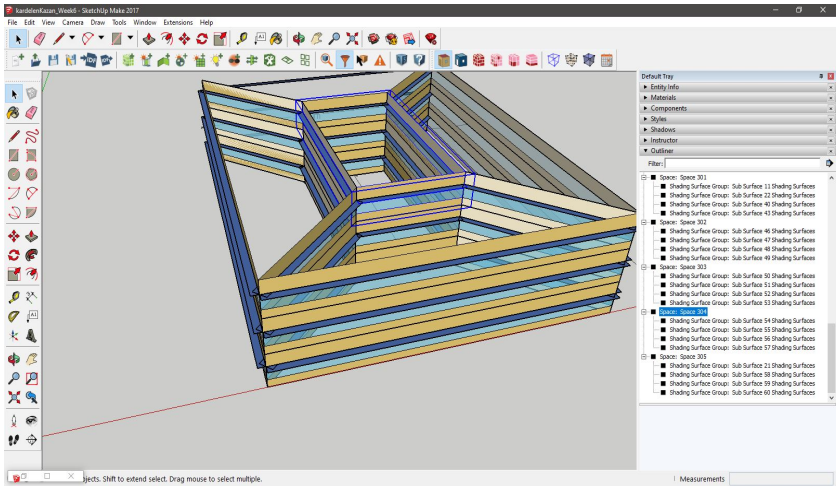
STEP3: ıf you want to create the windows for model, you should follow these step;
Select the model -> extension -> open studio use scripts -> alter or add model elements -> set window



STEP4: To add all part of the model except north, you should following steps.(because we don't want outer shading in the north.)
Select th model-> use " search surfaces" tool

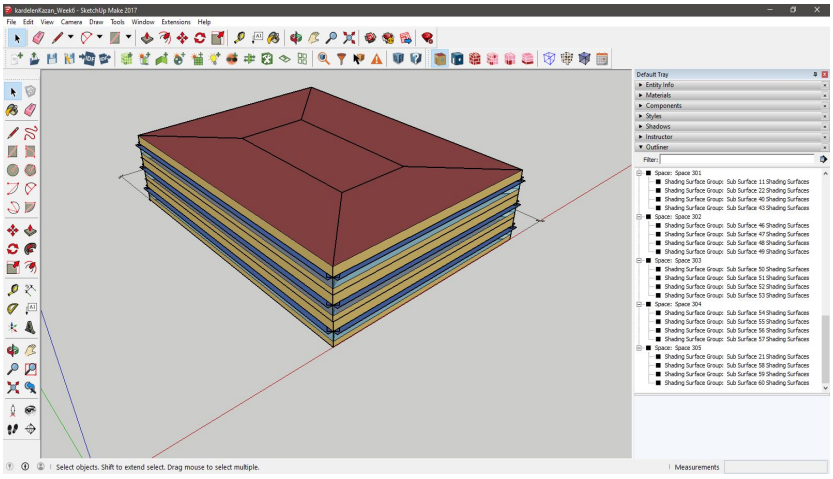


STEP5: to add external shading follow these steps;
Select the model-> extension -> open studio use scripts -> alter or add model elements -> add overhangs by factors



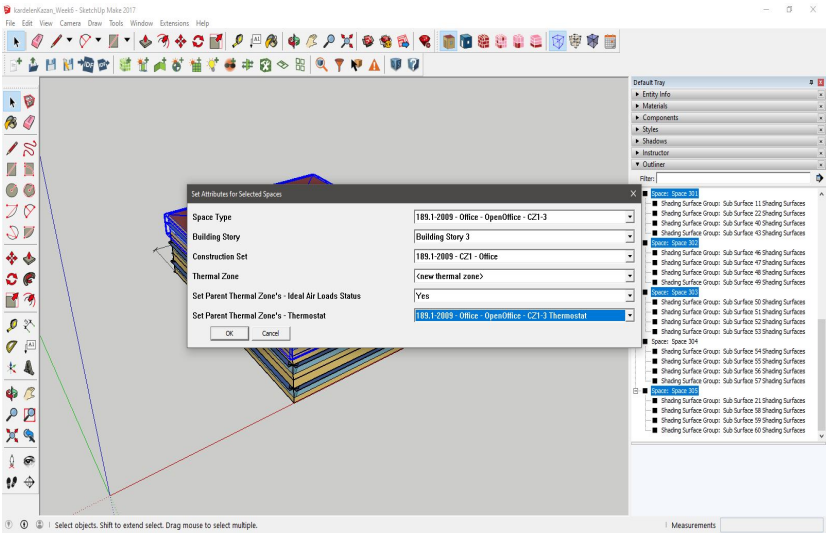
And to unhide the all model with north part you should get back into the step 4 and enter the first version of the numbers.

STEP6: to Open outliner ;
Window -> default tray -> outliner

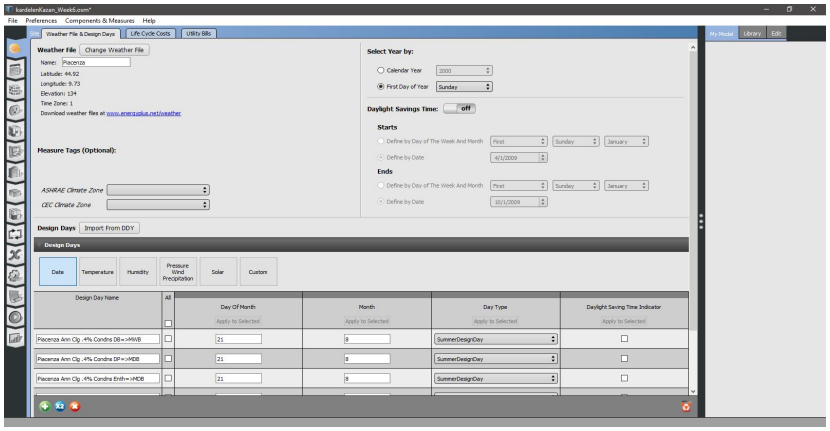


STEP7: to give data to the spaces,you should follow these steps;
Choose the spaces (101 ,102 ,103 ,105) ->click on set attributes for selected spaces -> give data

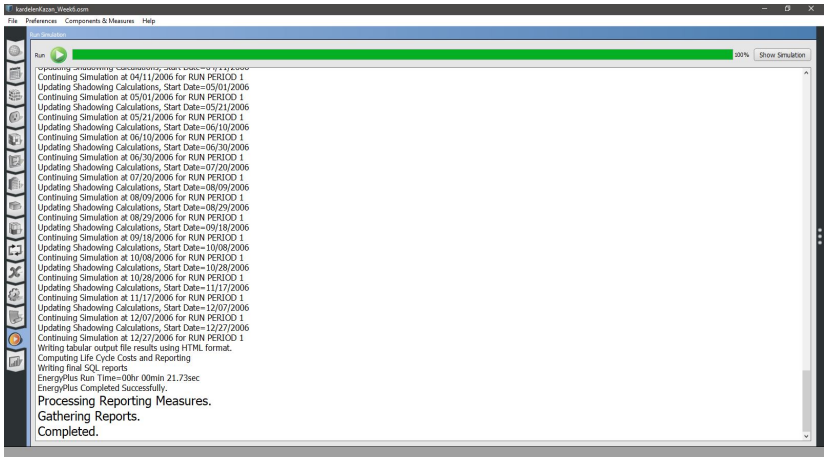
And you should use these stpes for every level

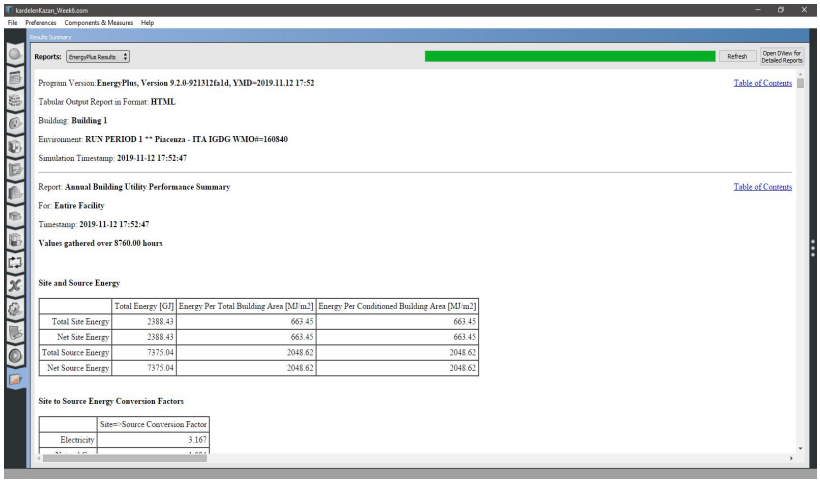


STEP7:you save your file with the extension. After that you enter open studio software . So you can take a report with your file.



You should select run tool and clik on the tool for the project


kardelenKazan_Week6.osm
File Preferences Components & Measures Help
Run
100%
Show Simulation
Continuing Simulation at 04/11/2006 for RUN PERIOD 1
Updating Shadowing Calculations, Start Date=05/01/2006
Continuing Simulation at 05/01/2006 for RUN PERIOD 1
Updating Shadowing Calculations, Start Date=05/21/2006
Continuing Simulation at 05/21/2006 for RUN PERIOD 1
Updating Shadowing Calculations, Start Date=06/10/2006
Continuing Simulation at 06/10/2006 for RUN PERIOD 1
Updating Shadowing Calculations, Start Date=06/30/2006
Continuing Simulation at 06/30/2006 for RUN PERIOD 1
Updating Shadowing Calculations, Start Date=07/20/2006
Continuing Simulation at 07/20/2006 for RUN PERIOD 1
Updating Shadowing Calculations, Start Date=08/09/2006
Continuing Simulation at 08/09/2006 for RUN PERIOD 1
Updating Shadowing Calculations, Start Date=08/29/2006
Continuing Simulation at 08/29/2006 for RUN PERIOD 1
Updating Shadowing Calculations, Start Date=09/18/2006
Continuing Simulation at 09/18/2006 for RUN PERIOD 1
Updating Shadowing Calculations, Start Date=10/08/2006
Continuing Simulation at 10/08/2006 for RUN PERIOD 1
Updating Shadowing Calculations, Start Date=10/28/2006
Continuing Simulation at 10/28/2006 for RUN PERIOD 1
Updating Shadowing Calculations, Start Date=11/17/2006
Continuing Simulation at 11/17/2006 for RUN PERIOD 1
Updating Shadowing Calculations, Start Date=12/07/2006
Continuing Simulation at 12/07/2006 for RUN PERIOD 1
Updating Shadowing Calculations, Start Date=12/27/2006
Continuing Simulation at 12/27/2006 for RUN PERIOD 1
Writing tabular output file results using HTML format.
Computing Life Cycle Costs and Reporting
Writing final SQL reports
EnergyPlus Run Time=00hr 00min 21.73sec
EnergyPlus Completed Successfully.
Processing Reporting Measures.
Gathering Reports.
Completed.


kardelenKazan_Week6.osm
File Preferences Components & Measures Help
Reports:
EnergyPlus Results
Refresh
Open D/dev for Detailed Reports
Program Version:EnergyPlus, Version 9.2.0-921312fa1d, YMD=2019.11.12 17:52
Table of Contents
Tabular Output Report in Format: HTML
Building: Building 1
Environment: RUN PERIOD 1 ** Piacenza - ITA IGDG WMO#=160840
Simulation Timestamp: 2019-11-12 17:52:47
Report: Annual Building Utility Performance Summary
Table of Contents
For: Entire Facility
Timestamp: 2019-11-12 17:52:47
Values gathered over 8760.00 hours
Site and Source Energy
Total Energy [GJ] | Energy Per Total Building Area [MJ/m2] | Energy Per Conditioned Building Area [MJ/m2]
Total Site Energy 2388.43 663.45 663.45
Net Site Energy 2388.43 663.45 663.45
Total Source Energy 7375.04 2048.62 2048.62
Net Source Energy 7375.04 2048.62 2048.62
Site to Source Energy Conversion Factors
Site=>Source Conversion Factor
Electricity 3.167