Task 1 :
Provide a summary of the main concepts that went through about solar radiation (formulas are not needed)

The solar radiation
The sun continuously in the form of electromagnetic waves around the radiation of energy called solar radiation, is the sun to the space of the electromagnetic wave and particle flow.The energy transmitted by solar radiation is called solar radiant energy.Solar radiation is a kind of short-wave radiation.

Solar radiation spectrum
Solar radiation is electromagnetic energy emitted by the sun.The max yearly average power density
- Out of the earth's atmosphere 1367W/m2 (solar constant)
- On the Earth's surface 1000W/m2
Solar radiation wavelength field: from 0.3 to 2.5 micrometer

Solar radiation characteristics
The solar radiation, which crosses the atmosphere to reach the Earth's surface, is modified (attenuation), both in spectral distribution and in total irradiance.
That is due to dispersion (molecular and particle scattering) and absorption phenomena.

Direct (beam) and diffuse radiation
The solar radiation reaching the Earths surface can be divided into two types of solar radiation: Direct beam solar radiation and diffuse solar radiation.
As sunlight passes through the atmosphere, some of it enters the surface of the Earth direct and undisturbed- the so- called beam solar radiation. Beam solar radiation throws sharp shadows and can atmosphere it is absorbed, scattered, or reflected by dust, water vapor, clouds, pollutants, etc.Diffuse solar radiation does not throw sharp shadows and cannot be focused.

Atmospheric Absorption
Solar radiation absorption is due to some atmospheric components, especially ozone, water and carbon dioxide, which absorb the incident radiation in specific wavelength bands consequently modifying its energetic spectrum.
Stratospheric ozone absorb almost all the ultraviolet component of the solar radiation for wavelength less than 0.29 μ m
The absorb solar energy is converted into internal energy and therefore reemitted in the far infrared(long wave) in all the directions.

Air mass
The sun to the zenith crosses the minimum thickness of the atmosphere, the sun with an elevated zenith angle crosses a large thickness of the atmosphere.
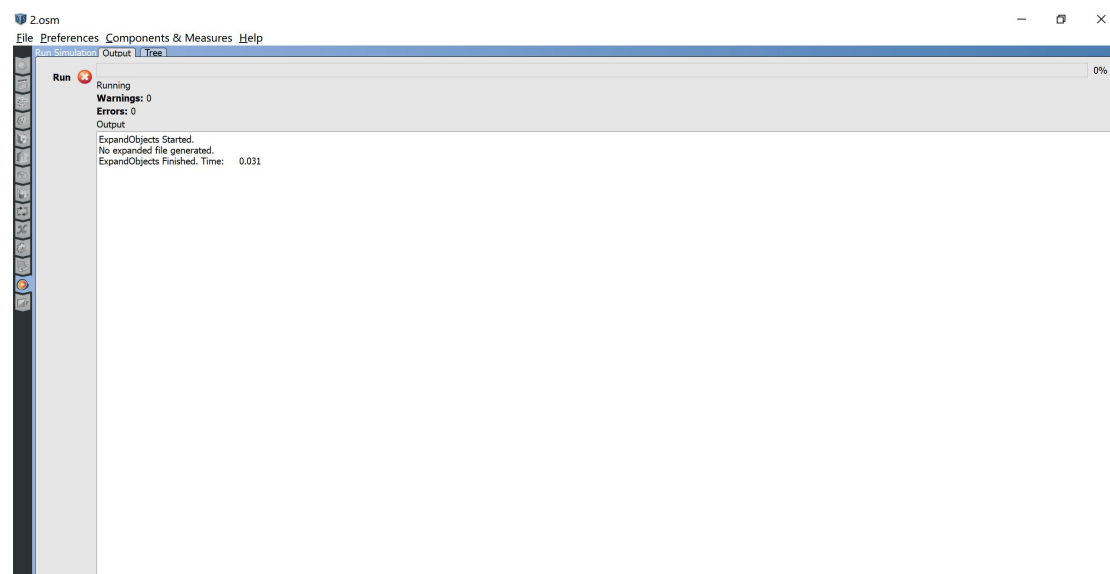
Solar energy: availability

The solar radiation, available on the Earth's surface for conversion in the other energy forms, depends on the sun position, the weather condition, the site altitude over the sea level and the daylight hours.

Task 2: Y create a pdf file with screenshots of all of the steps we went through in the second lesson on OpenStudio and explain briefly the reason behind the use of each step (in your own words)
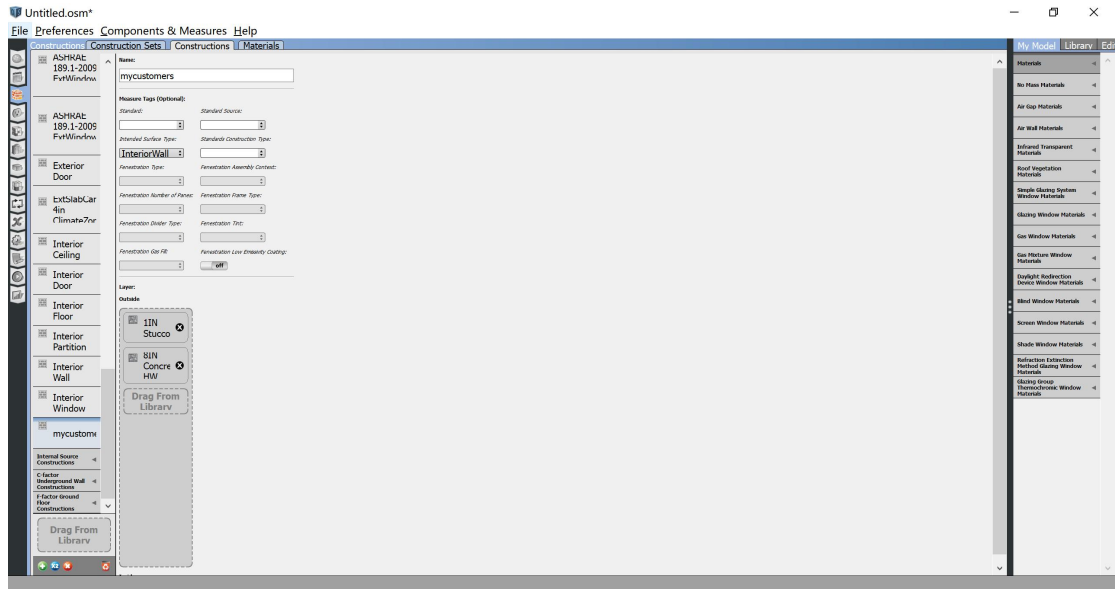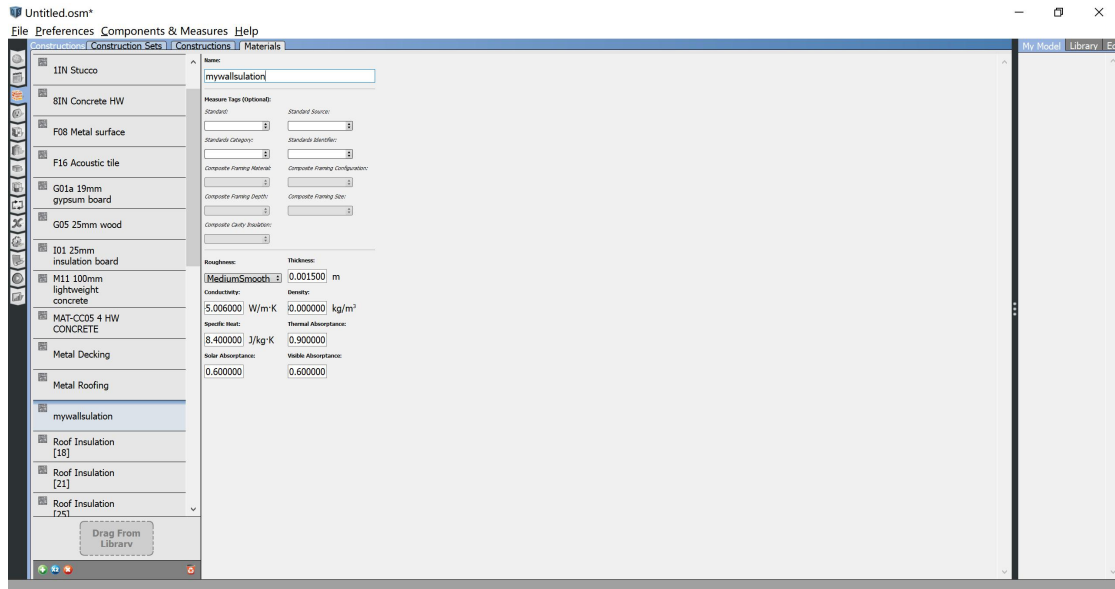
1) Add weather data
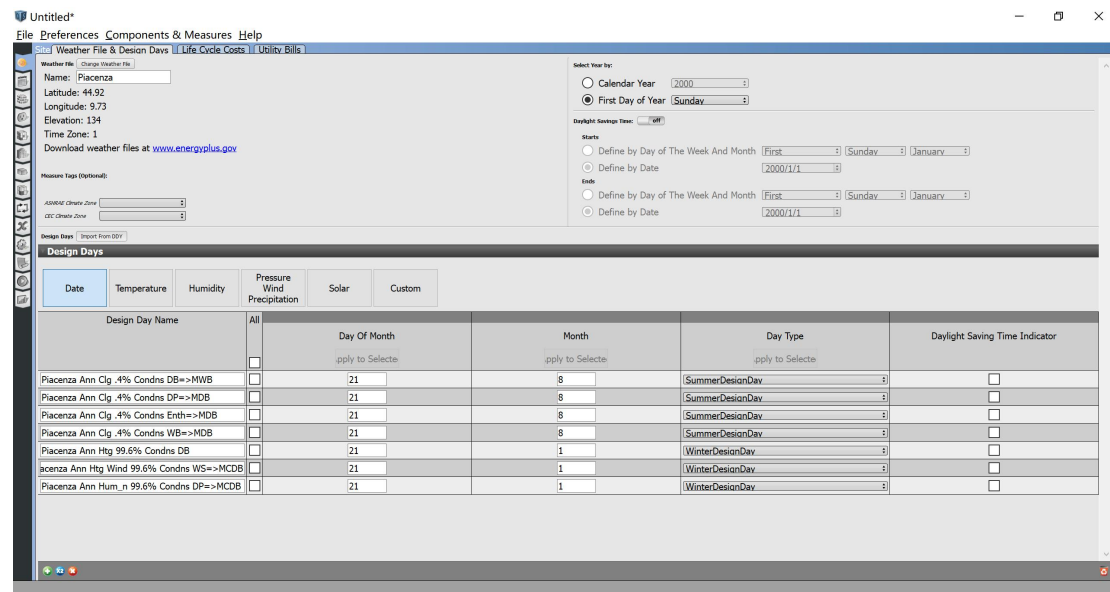
2)run simulation

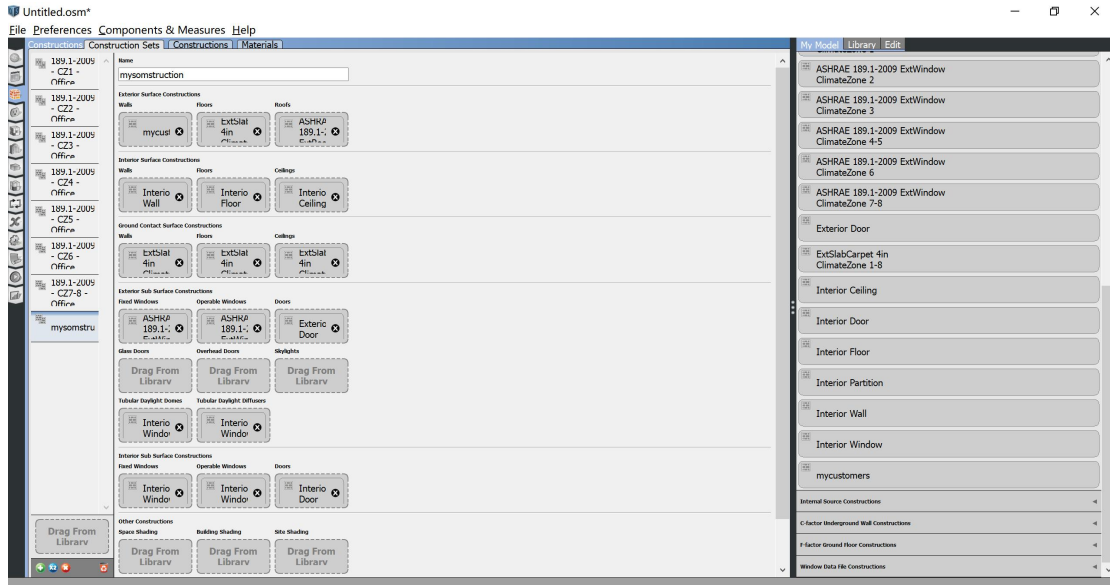
3)results analysis

4)construction-construction set: customize the building and rename it "myconstruction"
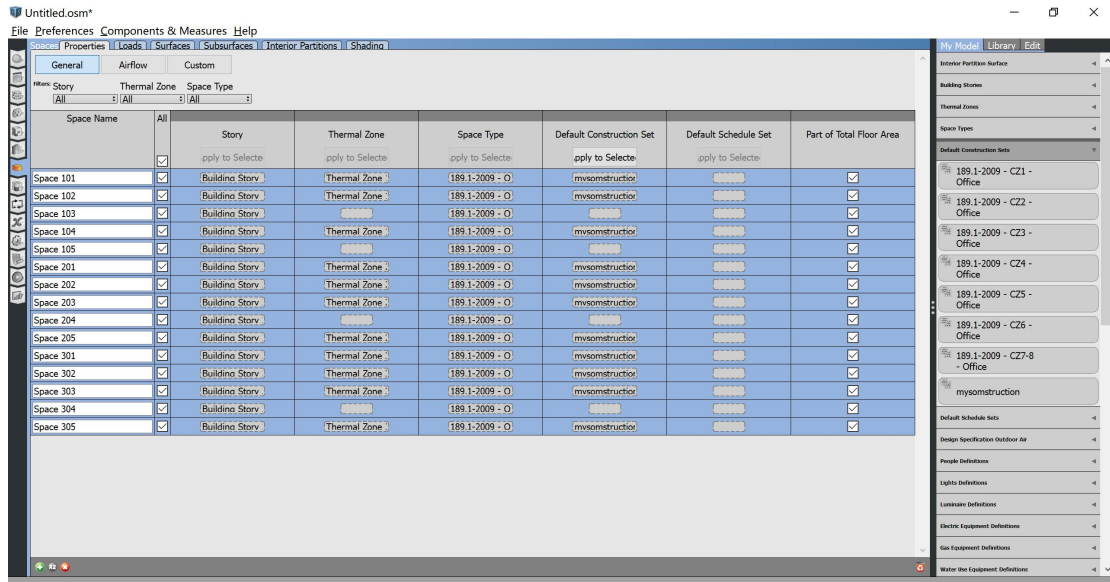

5)constructions--custom my structure

6) constructions--custom the material of my wall

7) Insert my customer into my construction set

8)"space"window: insert "myconstructionset" and apply it into the whole building

9)go to schedule set and custom all the information about people, light, electric...

File Preferences Components & Measures Help

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Loads

189.1-2009 - Office - Corridor - CZ4-8 People Definition

189.1-2009 - Office - IT_Room - CZ1-3 People Definition

189.1-2009 - Office - IT_Room - CZ4-8 People Definition

189.1-2009 - Office - Lobby - CZ1-3 People Definition

189.1-2009 - Office - Lobby - CZ4-8 People Definition

189.1-2009 - Office - OpenOffice - CZ4-8 People Definition

mycustompeople

189.1-2009 - Office - PrintRoom - CZ1-3 People Definition

189.1-2009 - Office - PrintRoom - CZ4-8 People Definition

189.1-2009 - Office - Restroom - CZ1-3 People Definition

189.1-2009 - Office - Restroom - CZ4-8 People Definition

189.1-2009 - Office - Vending - CZ1-3 People Definition

189.1-2009 - Office - Vending - CZ4-8 People Definition

189.1-2009 - Office - WholeBuilding - Lg Office - CZ1-3 People Definition

189.1-2009 - Office - WholeBuilding - Lg Office - CZ4-8 People Definition

Drag From Library

Name:
mycustompeople

Number of People: People per Space Floor Area: Space Floor Area per Person:
                    0.056511   people/m^2 m^2/person

Fraction Radiant: Sensible Heat Fraction: Carbon Dioxide Generation Rate:
0.300000   calculate   0.000038   L/s·W

Ruleset Schedules
Compact Schedules
Constant Schedules
Fixed Interval Schedules
Variable Interval Schedules
Constructions
Internal Source Constructions
C-factor Underground Wall Constructions
F-factor Ground Floor Constructions
Window Data File Constructions

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Loads

CZ4-8 Electric Equipment Definition

189.1-2009 - Office - Restroom - CZ1-3 Electric Equipment Definition

189.1-2009 - Office - Restroom - CZ4-8 Electric Equipment Definition

189.1-2009 - Office - Vending - CZ1-3 Electric Equipment Definition

189.1-2009 - Office - Vending - CZ4-8 Electric Equipment Definition

189.1-2009 - Office - WholeBuilding - Lg Office - CZ1-3 Electric Equipment Definition

189.1-2009 - Office - WholeBuilding - Lg Office - CZ4-8 Electric Equipment Definition

189.1-2009 - Office - WholeBuilding - Md Office - CZ1-3 Electric Equipment Definition

189.1-2009 - Office - WholeBuilding - Md Office - CZ4-8 Electric Equipment Definition

189.1-2009 - Office - WholeBuilding - Sm Office - CZ1-3 Electric Equipment Definition

mycustomelectric

189.1-2009 - Office - WholeBuilding - Sm Office - CZ4-8 Electric Equipment Definition

Gas Equipment Definitions
Steam Equipment Definitions
Other Equipment Definitions

Drag From Library

Name:
mycustomelectric

Design Level: Energy Per Space Floor Area: Energy Per Person:
       W   5.812512   W/m^2 W/person

Fraction Latent: Fraction Radiant:
0.000000   0.000000

Fraction Lost:
0.000000

Ruleset Schedules
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Constant Schedules
Fixed Interval Schedules
Variable Interval Schedules
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F-factor Ground Floor Constructions
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