

WEEK 6 SUBMISSION

QUESTION 1:

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

ANSWER 1:

Solar irradiance:

It is the power per unit area (watt per square metre, W/m^2), received from the Sun in the form of electromagnetic radiation as reported in the wavelength range of the measuring instrument. Solar irradiance is often integrated over a given time period in order to report the radiant energy emitted into the surrounding environment (joule per square metre, J/m^2), during that time period.

Diffuse and direct beam solar radiation:

"Direct radiation" is also sometimes called "beam radiation" or "direct beam radiation". It is used to describe solar radiation traveling on a straight line from the sun down to the surface of the earth.

"Diffuse radiation", on the other hand, describes the sunlight that has been scattered by molecules and particles in the atmosphere but that has still made it down to the surface of the earth.

Direct radiation has a definite direction but diffuse radiation is just going any which way. Because when the radiation is direct, the rays are all travelling in the same direction, an object can block them all at once. This is why shadows are only produced when direct radiation is blocked.

Absorption of solar radiation:

Part of the radiation reaching an object is absorbed and the remainder reflected. Usually the absorbed radiation is converted to thermal energy, increasing the object's temperature.

Air mass:

An air mass is a volume of air defined by its temperature and water vapor content. Air masses cover many hundreds or thousands of miles, and adapt to the characteristics of the surface below them. They are classified according to latitude and their continental or maritime source regions.

The solar radiation density:

The maximum yearly average solar radiation density is the solar constant, which is the solar irradiance which value is 1367W/m^2 .

Solar energy: availability

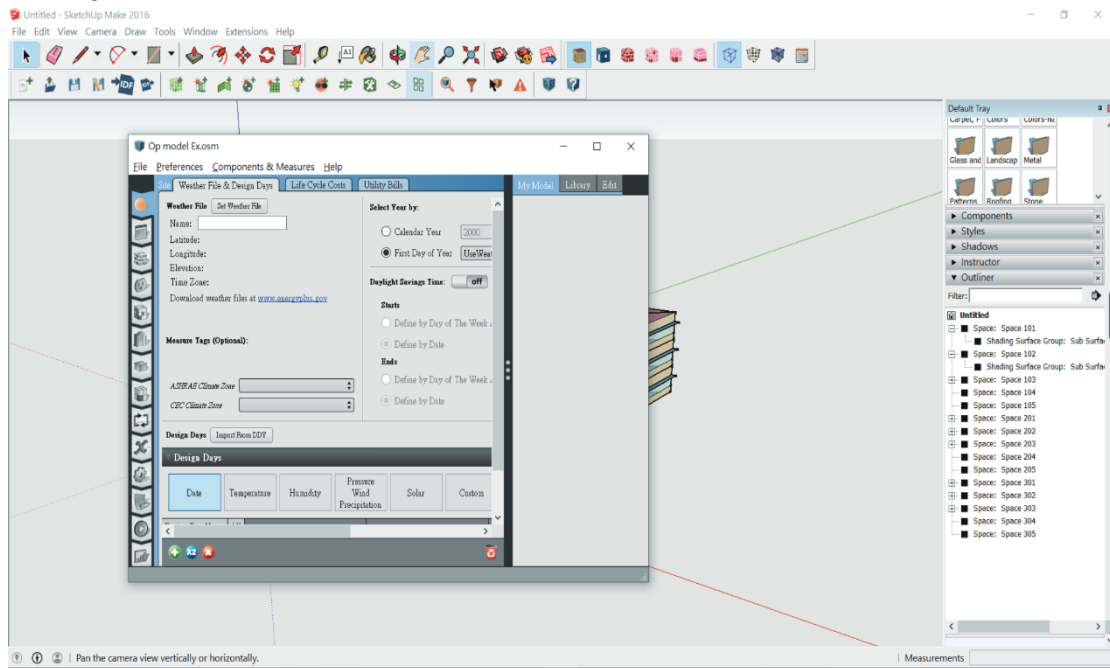
The sun imparts a huge amount of sunlight on the Earth every day, and although about half of it is reflected by the atmosphere, the Earth absorbs about 3,850,000 exajoules of solar energy every year.

QUESTION 2:

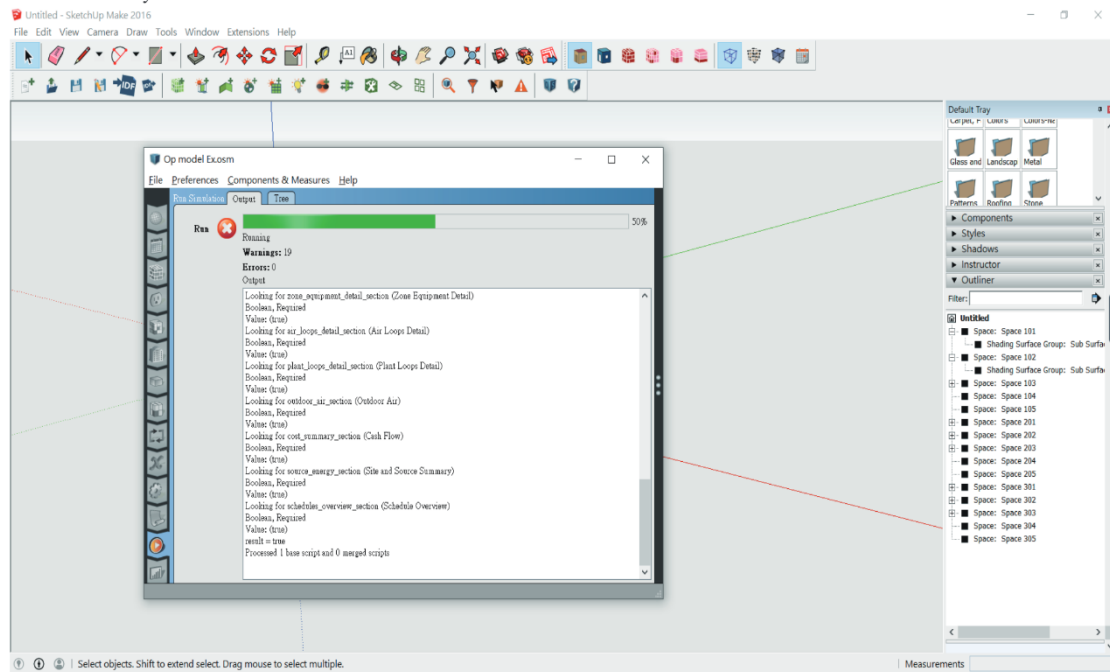
create a pdf file with screenshots of all of the steps we went through in the second lesson on OpenStudio and explain briefly the reason behind the use of each step (in your own words!).

ANSWER 2:

Adding weather data.



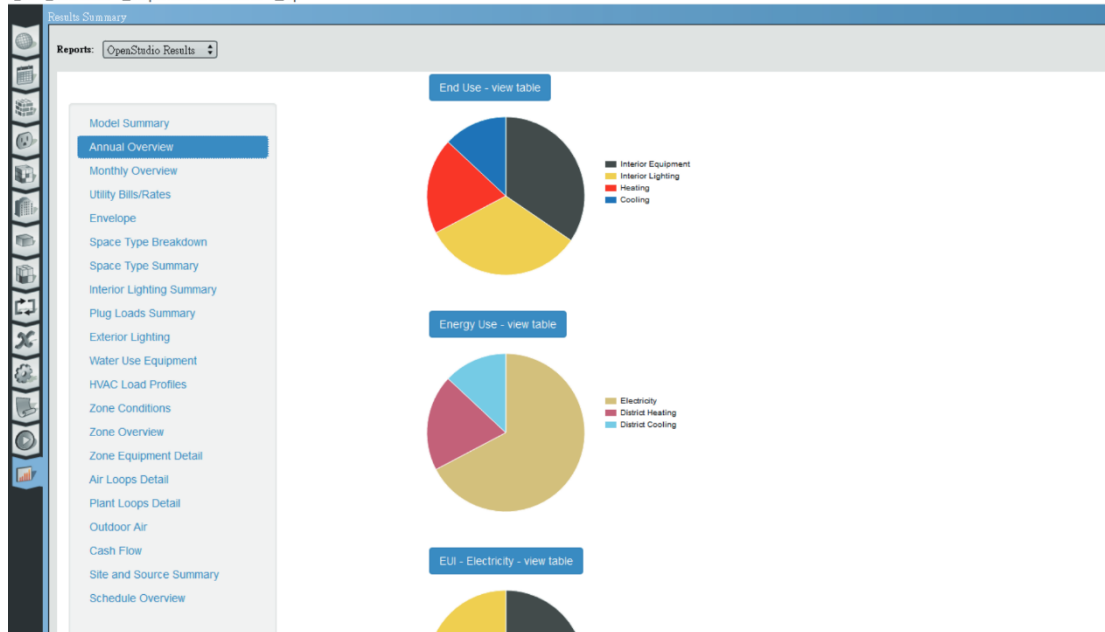
Run the analysis



Op model Ex.osm

Op model Ex.osm

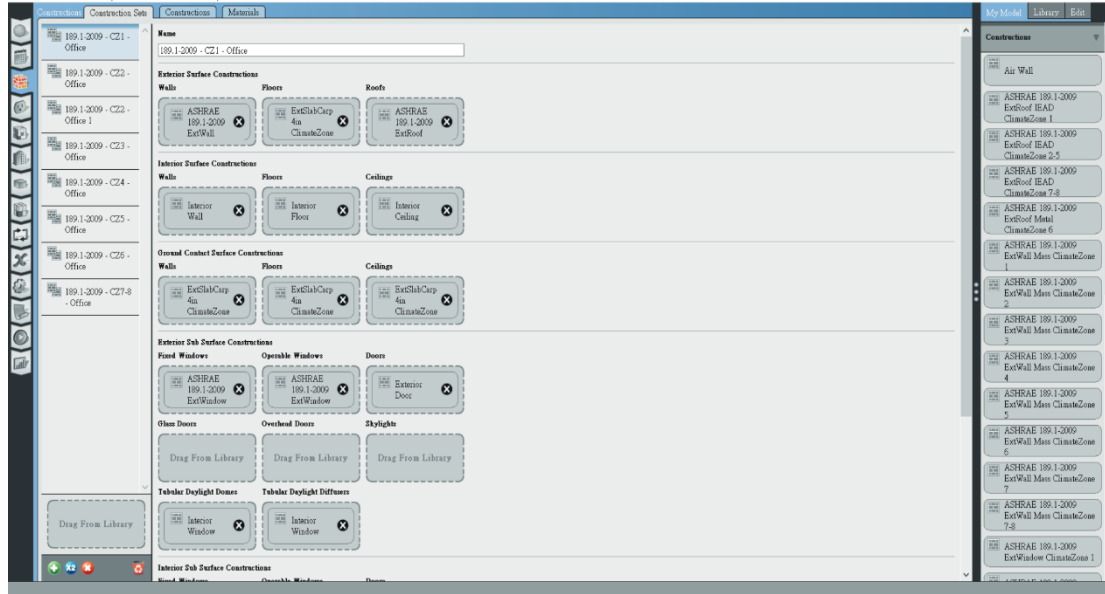
File Preferences Components & Measures Help



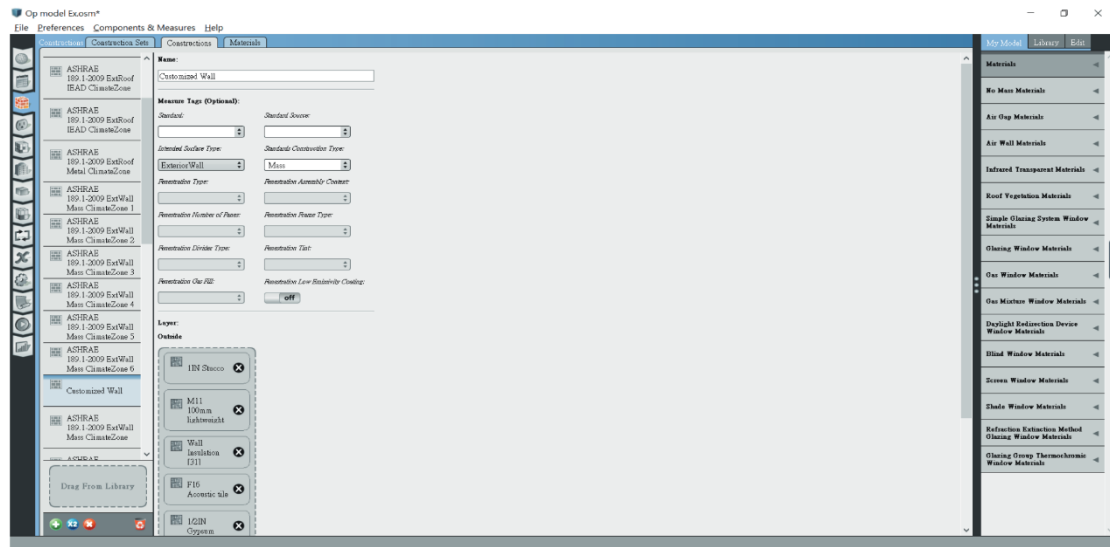
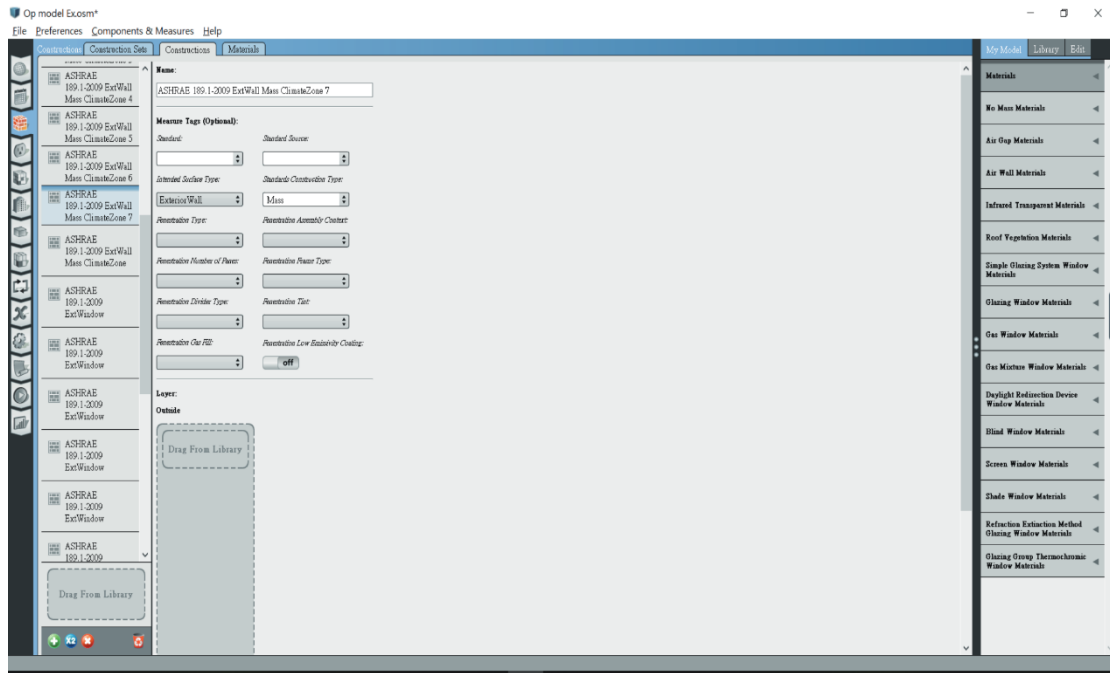
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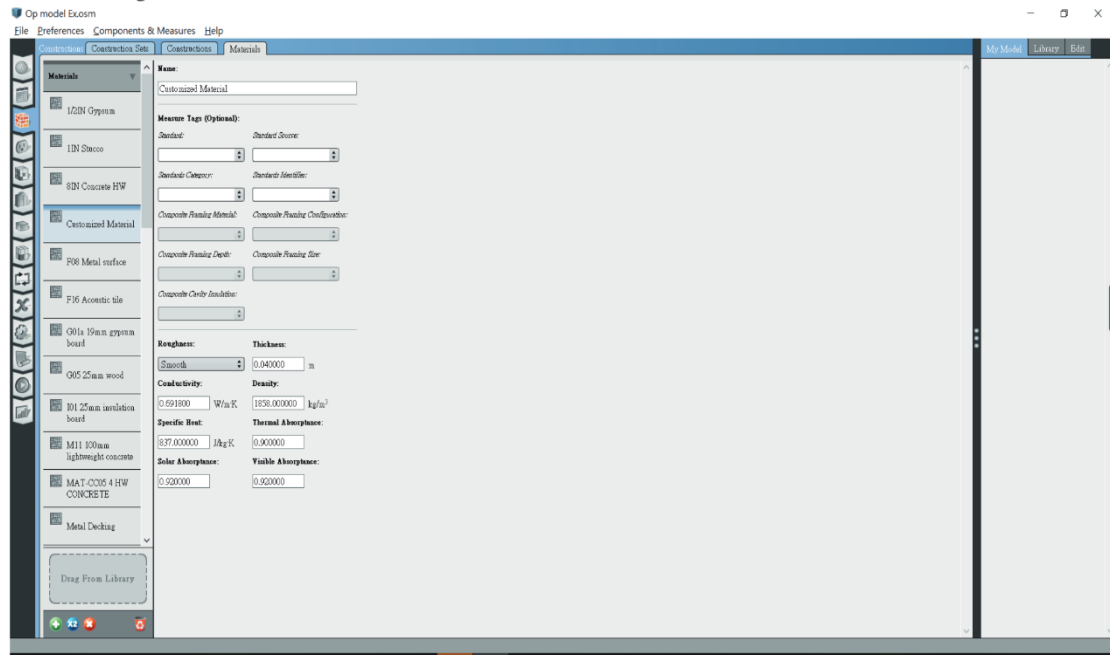
File Preferences Components & Measures Help



Customizing the walls



Customizing materials



Applying the customized walls to construction

