Surface Inside Face Solar Radiation Heat Gain Rate [W](TimeStep)

*These “inside face solar radiation heat gain” output variables describe the heat transferred by solar radiation onto the inside face.*

Surface Inside Face Internal Gains Radiation Heat Gain Rate[W](TimeStep)

*These “inside face internal gains radiation heat gain” output variables describe the heat transferred by longwave infrared thermal radiation onto the inside face that emanated from internal gains such as lights, electric equipment, and people.*

Surface Outside Face Solar Radiation Heat Gain Rate [W](TimeStep)

These “outside face solar radiation” output variables describe the heat transferred by the absorption of solar radiation at the outside face.

Zone Infiltration Sensible Heat Loss Energy [J]

*The sensible (temperature) heat loss that occurs when the infiltration air temperature (outdoor****) <*** *zone air temperature.*

Zone Air System Sensible Heating Energy

Zone Air System Sensible Cooling Energy

*Zone Air System Sensible Heating (and Cooling) Energy (and Rate) all report the heating or cooling delivered by the HVAC system to a zone. These values are calculated by multiplying the supply air mass flow rate by the difference between the supply air temperature and the zone air temperature. This does not always indicate the operation of heating or cooling coils. For example, cooling will be reported if the supply air is cooled due to the introduction of outside air, even if all coils are off.*

Zone Total Internal Convective Heating Energy

*These output variables represent the sum of convective gains from specific sources (e.g. equipment) throughout the space or zone in Watts (for rate) or joules. This includes convective gain from People, Lights, Electric Equipment, Gas Equipment, Other Equipment, Hot Water Equipment, and Steam Equipment.*

A picture containing shoji

Description automatically generated

T\_a ambient temperature

T\_z mean air temperature

(T\_g ground temperature is constant, 18 Celsius degrees)

Q\_HVAC\_cooling, Q\_HVAC\_heating

Q\_Infiltration\_Heat\_Loss

q\_internal\_convective\_heat\_gain

A picture containing shoji

Description automatically generated

Continue working on RC model

Transfer to python

How to improve?

Jaewan paper configuration

Construction setting for ABCD derivation

A typical objective function is the summation of squared residual between the actual operation and the model prediction through all iterations, n.

Obj\_func errors, and swarm total loss

sum(abs(y\_model - y\_measure))

there is no need to average the objective function loss.

Open plan office 9.9 \* 10.5 \* 3 m

1.52 meter cavity