accim

Daniel Sánchez-García

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TUTORIAL:

CHAPTER

ONE

1. REQUIREMENTS

To use accim, the following must be installed:

- **Python 3.9**
  - When installing it, tick the checkbox "Add Python 3.9 to PATH"
  - Disable path length limit
- EnergyPlus (any version between 9.1 and 23.1 those included) in default path (`C:\EnergyPlusV23-1-0`)

Also, Jupyter Notebook is recommended, in order to run the notebooks within path `accim/sample_files/jupyter_notebook`

CHAPTER

TWO

2. INSTALLATION

First of all, you need to install the package. To install the latest version, execute:

```
pip install accim
```

To install some specific version, execute the same code followed by "==version number". For instance, to install version 0.6.11:

```
pip install accim==0.6.11
```

CHAPTER

THREE

3. QUICK TUTORIAL

3.1 3.1 Implementing adaptive setpoint temperatures

This is a very brief explanation of the usage. Therefore, if you don't get the results you expected or get some error, I would recommend reading the 'Detailed use' section at the documentation in the link below.

accim will take as input IDF files those located at the same path as the script. You only need to run the following code:

3.1.1 3.1.1 Short version

```
from accim.sim import accis
accis.addAccis()
```

Once you run this code, you will be asked to enter some information at the terminal or python console to generate the output IDF files.

3.1.2 3.1.2 Long version

```
from accim.sim import accis
accis.addAccis(
    ScriptType=str, # ScriptType: 'vrf_mm', 'vrf_ac', 'ex_mm', 'ex_ac'. For instance:␣
↪ScriptType='vrf_ac',
    SupplyAirTempInputMethod=str, # SupplyAirTempInputMethod: 'supply air temperature',
↪'temperature difference'. For instance: SupplyAirTempInputMethod='supply air temperature',
    Output_keep_existing=bool, # Output_keep_existing: True or False. For instance:␣
↪Output_keep_existing=False,
    Output_type=str, # Output_type: 'simplified', 'standard', 'detailed' or 'custom'. For␣
↪instance: Output_type='standard',
    Output_freqs=list, # Output_freqs: ['timestep', 'hourly', 'daily', 'monthly', 'runperiod'].␣
↪For instance: Output_freqs=['hourly', 'runperiod'],
    Output_gen_dataframe=bool, # Output_keep_existing: True or False. For instance:␣
↪Output_keep_existing=False,
    Output_take_dataframe=pandas Dataframe,
    EnergyPlus_version=str, # EnergyPlus_version: '9.1', '9.2', '9.3', '9.4', '9.5', '9.6', '22.1
↪', '22.2' or '23.1'. For instance: EnergyPlus_version='23.1',
    TempCtrl=str, # TempCtrl: 'temperature' or 'temp', or 'pmv'. For instance: TempCtrl='temp
↪',
    ComfStand=list, # it is the Comfort Standard. Can be any integer from 0 to 21. For␣
```

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```
↪instance: ComfStand=[0, 1, 2, 3],
    CAT=list, # it is the Category. Can be 1, 2, 3, 80, 85 or 90. For instance: CAT=[3,␣
↪80],
    ComfMod=list, # it is Comfort Mode. Can be 0, 1, 2 or 3. For instance: ComfMod=[0,␣
↪3],
    SetpointAcc=float, # it is the accuracy of the setpoint temperatures
    CoolSeasonStart=dd/mm date in string format or integer to represent the day of the␣
↪year, # it is the start date for the cooling season
    CoolSeasonEnd=dd/mm date in string format or integer to represent the day of the␣
↪year, # it is the end date for the cooling season
    HVACmode=list, # it is the HVAC mode. 0 for Full AC, 1 for NV and 2 for MM. For␣
↪instance: HVACmode=[0, 2],
    VentCtrl=list, # it is the Ventilation Control. Can be 0 or 1. For instance:␣
↪VentCtrl=[0, 1],
    MaxTempDiffVOF=float, # When the difference of operative and outdoor temperature␣
↪exceeds MaxTempDiffVOF, windows will be opened the fraction of MultiplierVOF. For␣
↪instance: MaxTempDiffVOF=20,
    MinTempDiffVOF=float, # When the difference of operative and outdoor temperature is␣
↪smaller than MinTempDiffVOF, windows will be fully opened. Between min and max,␣
↪windows will be linearly opened. For instance: MinTempDiffVOF=1,
    MultiplierVOF=float, # Fraction of window to be opened when temperature difference␣
↪exceeds MaxTempDiffVOF. For instance: Multiplier=0.2,
    VSToffset=list, # it is the offset for the ventilation setpoint. Can be any number,␣
↪float or int. For instance: VSToffset=[-1.5, -1, 0, 1, 1.5],
    MinOToffset=list, # it is the offset for the minimum outdoor temperature to␣
↪ventilate. Can be any positive number, float or int. For instance: MinOToffset=[0.5, 1,
↪ 2],
    MaxWindSpeed=list, # it is the maximum wind speed allowed for ventilation. Can be␣
↪any positive number, float or int. For instance: MinOToffset=[2.5, 5, 10],
    ASTtol_start=float, # it is the start of the tolerance sequence. For instance:␣
↪ASTtol_start=0,
    ASTtol_end_input=float, # it is the end of the tolerance sequence. For instance:␣
↪ASTtol_start=2,
    ASTtol_steps=float, # these are the steps of the tolerance sequence. For instance:␣
↪ASTtol_steps=0.25,
    NameSuffix=str # NameSuffix: some text you might want to add at the end of the␣
↪output IDF file name. For instance: NameSuffix='whatever',
    verboseMode=bool # verboseMode: True to print all process in screen, False to not to␣
↪print it. Default is True. For instance: verboseMode=True,
    confirmGen=bool # True to confirm automatically the generation of IDFs; if False, you
↪'ll be asked to confirm in command prompt. Default is False. For instance:␣
↪confirmGen=False,
)
```

3.2 3.1 Other uses

Although the main use of accim is the implementation of adaptive setpoint temperatures, there are some functions, classes and methods that allow to roughly automate the whole process consisting of preparation of the epw and idf files, the simulation runs and the data analysis. For further information, please refer to the How-to Guides section in this documentation, which contains some Jupyter Notebooks that can also be found in accim's installation folder.

CHAPTER

FOUR

4. DETAILED USE AND EXPLANATION OF ARGUMENTS

4.1 4.1 First steps

Four main branches of functions have been developed, which are:

- VRF system with full air-conditioning mode: This mode has been developed mainly to support models originated with OpenStudio, which up to date does not support Airflow Network objects and subsequently Calculated Natural Ventilation. It adds standard VRF systems for each occupied zone and applies the adaptive or PMV-based setpoint temperatures, but only works with full air-conditioning mode.
- VRF system with mixed mode: It adds standard VRF systems for each occupied zone and applies the adaptive or PMV-based setpoint temperatures. Works with Calculated Natural Ventilation, although full air-conditioning mode can also be used. If mixed mode is used, the model must be generally developed with DesignBuilder.
- Existing HVAC system only with full air-conditioning mode: Keeps the existing HVAC systems and modify the existing setpoint temperatures to adaptive or PMV-based setpoint temperatures. However, mixed-mode and naturally ventilated modes are not available in this mode.
- Existing HVAC system with mixed mode: UNDER DEVELOPMENT. IT IS NOT ADVISABLE TO USE IT YET. Keeps the existing HVAC systems and modify the existing setpoint temperatures to adaptive or PMV-based setpoint temperatures, considering mixed-mode. In order to properly work, there must be only one object for heating and another for cooling that can be used to monitor if these are turned on at any timestep (such as `Coil:Cooling:Water` and `Coil:Heating:Water`). Also, these objects must be named following the pattern "Zone name" "Object name". For instance, an `Coil:Heating:Electric` object could be named `Block1:Zone1 PTAC Heating Coil`, given that `Block1:Zone1` is a valid zone name. On the other hand, a `Coil:Cooling:Water` object named `Main Cooling Coil 1` would not be valid, since in this case the room would be `Main`; this is the typical case of some equipment shared by multiple rooms. If this condition is not met, accim will not generate the output IDF files for that input IDF file. For instance, if there are `Coil:Heating:Electric` and `Coil:Heating:DX:SingleSpeed` objects in the same model, simulation will crash. Also, if there is just an `ZoneHVAC:Baseboard:RadiantConvective:Water` used for heating, and cooling is not monitored, simulation will also crash.

Therefore, if you are going to use the VRF system script, you're supposed to have one or multiple IDFs with fixed setpoint temperature, or even without any HVAC objects at all (it doesn't matter, since the module is going to add a standard VRF system for each zone, and the simulation is going to be calculated with these VRF systems), and with Calculated Natural Ventilation if you're going to use the Mixed Mode. On the other hand, if you are going to use any ExistingHVAC script, again you're supposed to have one or multiple IDFs, however in this case there must be a fully functional HVAC system. Therefore, you must be able to successfully run a simulation with fixed setpoint temperatures in order for the accim package to work. The main difference between ExistingHVAC only with full air-conditioning and with mixed mode is that in the latter, the existing HVAC system needs to be mapped in order to monitor if it needs to be activated or not, and windows need to be actuated in case conditions for natural ventilation are favourable. In both cases, when you export the IDF, please do not request ASHRAE 55 or CEN 15251 results. accim will do so by adding the relevant fields to the People objects.

By using any ExistingHVAC script you might not get the results that you expect, even if there are no errors in the accim and simulation processes. The reason lies on the HVAC system itself, and that is why the VRFsystem script has been developed, because it has been tested that it works.

No matter what type or functions are you going to use, the language of the software used to create the input IDF should be English (for example, if you use Designbuilder in Spanish, accim won't work properly), and it's not recommended to use any non-standard characters in the input IDF, just like written accents or "ñ".

Said that, accim will transform all the IDF files located in the same path where script is. Therefore, the quickest way to run the script is opening a prompt command dialog in the folder where the IDF files are located (you can do this by holding Ctrl and right-click inside the folder, and click on 'open PowerShell window here'). Then run Python by typing 'python' in the command prompt.

First you need to import the module 'accis' (stands for Adaptive-Comfort-Control-Implementation Script):

```
>>> from accim.sim import accis
```

And then, you just need to call the accis function:

```
>>> accis.addAccis()
```

Then you'll be asked in the prompt to enter some information so that python knows how do you want to set up the output IDFs:

```
------------------------------------------------------------
Adaptive-Comfort-Control-Implemented Model (ACCIM)
------------------------------------------------------------

This tool allows to apply adaptive setpoint temperatures.
For further information, please read the documentation:
https://accim.readthedocs.io/en/master/
For a visual understanding of the tool, please visit the following jupyter notebooks:
-    Using addAccis() to apply adaptive setpoint temperatures
https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_
↪notebooks/addAccis/using_addAccis.ipynb
-    Using rename_epw_files() to rename the EPWs for proper data analysis after␣
↪simulation
https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_
↪notebooks/rename_epw_files/using_rename_epw_files.ipynb
-    Using runEp() to directly run simulations with EnergyPlus
https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_
↪notebooks/runEp/using_runEp.ipynb
-    Using the class Table() for data analysis
https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_
↪notebooks/Table/using_Table.ipynb

Now, you are going to be asked to enter some information for different arguments to␣
↪generate the output IDFs with adaptive setpoint temperatures.
If you are not sure about how to use these parameters, please take a look at the␣
↪documentation in the following link:
https://accim.readthedocs.io/en/master/4_detailed%20use.html

Please, enter the following information:

Enter the ScriptType (
```

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```
for VRFsystem with full air-conditioning mode: vrf_ac;
for VRFsystem with mixed-mode: vrf_mm;
for ExistingHVAC with mixed mode: ex_mm;
for ExistingHVAC with full air-conditioning mode: ex_ac
): vrf_mm

Enter the SupplyAirTempInputMethod (
for Supply Air Temperature: supply air temperature;
for Temperature Difference: temperature difference;
): temperature difference

Do you want to keep the existing outputs (true or false)?: false

Enter the Output type (standard, simplified, detailed or custom): standard

Enter the Output frequencies separated by space (timestep, hourly, daily, monthly,␣
↪runperiod): hourly runperiod

Do you want to generate a dataframe to see all outputs? (true or false): false

Enter the EnergyPlus version (9.1 to 23.1): 23.1

Enter the Temperature Control method (temperature or pmv): temperature
```

where:

- ScriptType can be 'vrf_mm', 'vrf_ac', 'ex_mm' or 'ex_ac', and it refers to the type of functions as explained above
- SupplyAirTempInputMethod can be 'supply air temperature' or 'temperature difference', and it is the supply air temperature input method for the VRF systems.
- Existing outputs in the IDF can be kept if entered 'true'. Otherwise, if entered 'false', it will be removed for clarity purposes at results stage.
- Output_type can be 'standard', 'detailed', 'simplified' or 'custom' and it refers to the simulation results: 'standard' means that results will contain the full selection relevant to accim;'detailed' is mainly used for testing the software tool; 'simplified' means that results are just going to be the hourly operative temperature and VRF consumption of each zone, mainly used when you need the results not to be heavy files, because you are going to run a lot of simulations and capacity is limited; and finally, 'custom' allows the user to specify the outputs to be kept or removed by entering them in the python console.
- Output_freqs (Output frequencies) can be timestep, hourly, daily, monthly and/or runperiod, and these must be entered separated by space. It will add the specified output type (standard or simplified) in all entered frequencies.
- Also, a pandas DataFrame instance can be created containing all Output:Variable objects. This allows the user to filter the DataFrame as needed, so that it only contains the needed Output:Variable objects, and then it can be entered in the argument `Output_take_dataframe`
- EnergyPlus_version can be from '9.1' to '23.1'. It is the version of EnergyPlus you have installed in your computer. If you enter '9.1', accim will look for the E+9.1.0 IDD file in path "C:\EnergyPlusV9-1-0".
- Temperature Control method can be 'temperature' or 'temp', or 'pmv'. If 'temp' is used, the setpoint will be the operative temperature, otherwise if 'pmv' is used, the setpoint will be the PMV index.

accis will show on the prompt command dialog all the objects it adds, and those that doesn't need to be added because were already in the IDF, and finally ask you to enter some values to set up the IDFs as you desire. Please refer to the

section titled 'Setting up the target IDFs'.

Once you run the simulations, you might get some EnergyPlus warnings and severe errors. This is something I'm currently working on.

4.2 4.2 Setting up the target IDFs

If you have run `accis.addAccis()`, you will be asked in the prompt to enter a few more values separated by space to set up the desired IDFs. However, you can also skip the command prompt process by running accis directly including the arguments in the function, whose usage would be:

```
>>> accis.addAccis(str, # ScriptType: 'vrf_mm', 'vrf_ac', 'ex_mm', 'ex_ac'
>>>                 str, # SupplyAirTempInputMethod: 'supply air temperature', 'temperature␣
↪difference'
>>>                 bool, # Output_keep_existing: True or False
>>>                 str, # Output_type: 'simplified', 'standard', 'detailed' or 'custom'
>>>                 list, # Output_freqs: ['timestep', 'hourly', 'daily', 'monthly', 'runperiod']
>>>                 bool, # Output_gen_dataframe: True or False
>>>                 pandas DataFrame, # Output_take_dataframe
>>>                 str, # EnergyPlus_version: '9.1', '9.2', '9.3', '9.4', '9.5', '9.6', '22.1',
↪'22.2' or '23.1'
>>>                 str, # TempCtrl: 'temperature' or 'temp', or 'pmv'
>>>                 list, # ComfStand, which is the Comfort Standard
>>>                 list, # CAT, which is the Category
>>>                 list, # ComfMod, which is Comfort Mode
>>>                 float, # SetpointAcc, which defines the accuracy of the setpoint␣
↪temperatures
>>>                 str containing a date in format dd/mm, or an int # CoolSeasonStart
>>>                 str containing a date in format dd/mm, or an int # CoolSeasonEnd
>>>                 list, # HVACmode, which is the HVAC mode
>>>                 list, # VentCtrl, which is the Ventilation Control
>>>                 float, # MaxTempDiffVOF
>>>                 float, # MinTempDiffVOF
>>>                 float, # MultiplierVOF
>>>                 list, # VSToffset
>>>                 list, # MinOToffset
>>>                 list, # MaxWindSpeed
>>>                 float, # ASTtol start
>>>                 float, # ASTtol end
>>>                 float, # ASTtol steps
>>>                 str # NameSuffix: some text you might want to add at the end of the␣
↪output IDF file name
>>>                 bool # verboseMode: True to print all process in screen, False to not␣
↪to print it. Default is True.
>>>                 bool # confirmGen: True to confirm automatically the generation of␣
↪IDFs; if False, you'll be asked to confirm in command prompt. Default is False.
>>>                 )
```

Some example of the usage could be:

```
>>> accis.addAccis(ScriptType='vrf_mm', # ScriptType: 'vrf_mm', 'vrf_ac', 'ex_mm', 'ex_ac'
>>>                 SupplyAirTempInputMethod='supply air temperature', #␣
```

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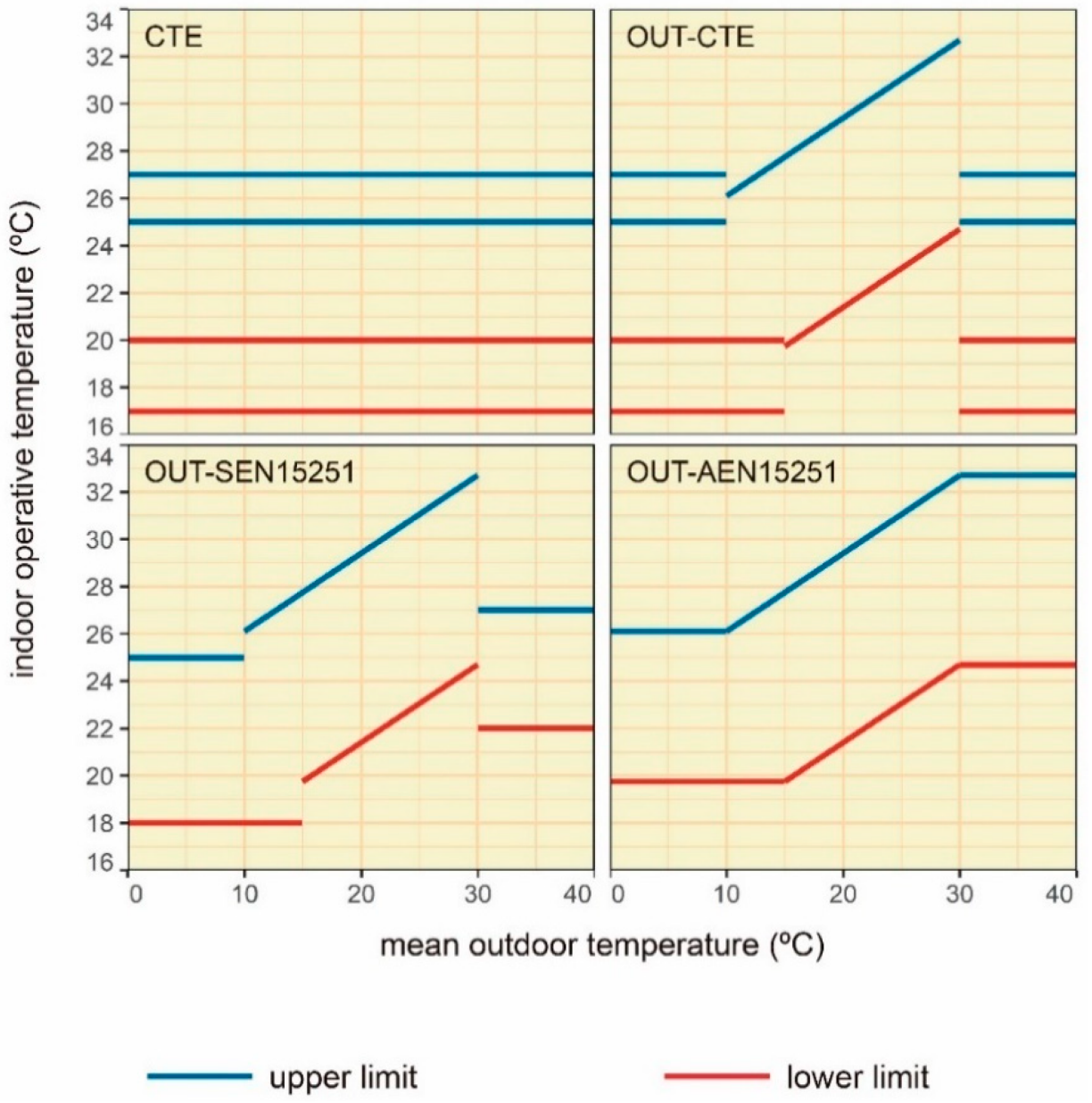
```
↪SupplyAirTempInputMethod: 'supply air temperature', 'temperature difference'
>>>                 Output_keep_existing=False, # Output_keep_existing: True or False
>>>                 Output_type='standard', # Output_type: 'simplified' or 'standard'
>>>                 Output_freqs=['hourly', 'runperiod'], # Output_freqs: ['timestep',
↪'hourly', 'daily', 'monthly', 'runperiod']
>>>                 Output_gen_dataframe=False,
>>>                 # we just omit Output_take_dataframe
>>>                 EnergyPlus_version='9.5', # EnergyPlus_version: '9.1', '9.2', '9.3', '9.4',
↪ '9.5', '9.6', '22.1', '22.2' or '23.1'
>>>                 TempCtrl='temp', # Temperature Control: 'temperature' or 'temp', or 'pmv'
>>>                 ComfStand=[0, 1, 2, 3], # ComfStand, which is the Comfort Standard
>>>                 CAT=[1, 2, 3, 80, 90], # CAT, which is the Category
>>>                 ComfMod=[0, 1, 2, 3], # ComfMod, which is Comfort Mode
>>>                 SetpointAcc=10, # Therefore, setpoints will be rounded to the first␣
↪decimal
>>>                 # we just omit CoolSeasonStart, since the default date is May 1st
>>>                 # we just omit CoolSeasonEnd, since the default date is September 1st
>>>                 HVACmode=[0, 1, 2], # HVACmode, which is the HVAC mode
>>>                 VentCtrl=[0, 1], # VentCtrl, which is the Ventilation Control
>>>                 MaxTempDiffVOF=20, # When the difference of operative and outdoor␣
↪temperature exceeds 20°C, windows will be opened the fraction of MultiplierVOF.
>>>                 MinTempDiffVOF=1, # When the difference of operative and outdoor␣
↪temperature is smaller than 1°C, windows will be fully opened. Between min and max,␣
↪windows will be linearly opened.
>>>                 MultiplierVOF=20, # Fraction of window to be opened when temperature␣
↪difference exceeds MaxTempDiffVOF.
>>>                 VSToffset=[0, 1, 2], # VSToffset, which is the Ventilation Setpoint␣
↪Temperature offset
>>>                 MinOToffset=[0, 1, 2], # MinOToffset, which is the Minimum Outdoor␣
↪Temperature offset
>>>                 MaxWindSpeed=[10, 20, 30], # MaxWindSpeed, which is th Maximum Wind␣
↪Speed
>>>                 ASTtol_start=0, # ASTtol_start, which is the start of the tolerance␣
↪sequence
>>>                 ASTtol_end_input=2, # ASTtol_end_input, which is the end of the␣
↪tolerance sequence
>>>                 ASTtol_steps=0.25, # ASTtol_steps, which are the steps of the␣
↪tolerance sequence
>>>                 NameSuffix='standard' # Name Suffix: for example, just in case you␣
↪want to clarify the outputs
>>>                 )
```

For clarity purposes, it's recommended to specify the argument name as well, as shown above. If you don't specify all arguments, you'll be ask to enter them at the prompt command, and these values will be used instead of those specified in the function call. Each argument is explained below:

- ComfStand: refers to the thermal comfort standard or model to be applied. Enter any number from 0 to 22 to select the comfort standard or model to be used; you can see which model is each number in the table below. For example, if you enter '0 1 2 3', you'll get IDFs for CTE, EN16798-1, ASHRAE 55 and the local model developed by Rijal et al for Japanese dwellings. If you don't enter any number, it'll ask you to enter the numbers again.

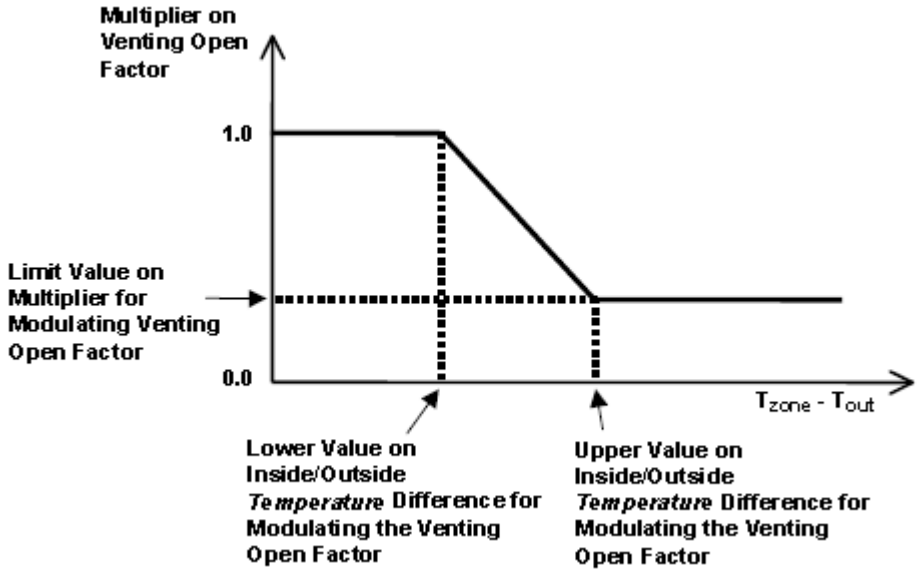
ComfStandNo.	ComfStandName	Area	Reference	
0	ESPCTE	Spain	The Government of Spain. Royal Decree 314/2006. Approving the Spanish Technical Building Code CTE-DB-HE-1 2013:1–43. https://www.boe.es/eli/es/rd/2006/03/17/314 (accessed August 6, 2021).	
1	INTEN16798	Europe	European committee for standardization. EN 16798-1:2019 Energy performance of buildings. Ventilation for buildings. Indoor environmental input parameters for design and assessment of energy performance of buildings addressing indoor air quality, thermal environment, lighting and acoustics. 2019. https://en.tien da.aenor.com/norma-bsi-bs-en-16798-1-2019-000000000030297474 (accessed August 6, 2021).	
2	INTASHRAE55	Worldwide	ASHRAE Standard 55-2020 Thermal Environmental Conditions for Human Occupancy, ASHRAE Standard (2020).	
3	JPNRijal	Japan	Rijal, H. B., Humphreys, M. A., & Nicol, J. F. (2019). Adaptive model and the adaptive mechanisms for thermal comfort in Japanese dwellings. Energy and Buildings, 202, 109371. https://doi.org/10.1016/j.enbuild.2019.109371	
4	CHNGBT50785Cold	China	MOHURD, Evaluation Standard for Indoor Thermal Environment in Civil Buildings (GB/T 50785-2012), Ministry of Housing and Urban-Rural Development (MOHURD), Beijing, China, 2012.	
5	CHNGBT50785HotMild	China	MOHURD, Evaluation Standard for Indoor Thermal Environment in Civil Buildings (GB/T 50785-2012), Ministry of Housing and Urban-Rural Development (MOHURD), Beijing, China, 2012.	
6	CHNYang	China	Yang, L., Fu, R., He, W., He, Q., & Liu, Y. (2020). Adaptive thermal comfort and climate responsive building design strategies in dry–hot and dry–cold areas: Case study in Turpan, China. Energy and Buildings, 209, 109678. https://doi.org/10.1016/j.enbuild.2019.109678	
7	INDIMACCNV	India	Manu, S., Shukla, Y., Rawal, R., Thomas, L. E., & de Dear, R. (2016). Field studies of thermal comfort across multiple climate zones for the subcontinent: India Model for Adaptive Comfort (IMAC). Building and Environment, 98, 55–70. https://doi.org/10.1016/j.buildenv.2015.12.019	
8	INDIMACCMM	India	Manu, S., Shukla, Y., Rawal, R., Thomas, L. E., & de Dear, R. (2016). Field studies of thermal comfort across multiple climate zones for the subcontinent: India Model for Adaptive Comfort (IMAC). Building and Environment, 98, 55–70. https://doi.org/10.1016/j.buildenv.2015.12.019	
9	INDIMACR7DRM	India	Rawal, R., Shukla, Y., Vardhan, V., Asrani, S., Schweiker, M., de Dear, R., Garg, V., Mathur, J., Prakash, S., Diddi, S., Ranjan, S. V., Siddiqui, A. N., & Somani, G. (2022). Adaptive thermal comfort model based on field studies in five climate zones across India. Building and Environment, 219, 109187. https://doi.org/10.1016/J.BUILDENV.2022.109187	
10	INDIMACR30DRM	India	Rawal, R., Shukla, Y., Vardhan, V., Asrani, S., Schweiker, M., de Dear, R., Garg, V., Mathur, J., Prakash, S., Diddi, S., Ranjan, S. V., Siddiqui, A. N., & Somani, G. (2022). Adaptive thermal comfort model based on field studies in five climate zones across India. Building and Environment, 219, 109187. https://doi.org/10.1016/J.BUILDENV.2022.109187	
11	INDDhaka	India	Dhaka, S., Mathur, J., Brager, G., & Honnekeri, A. (2015). Assessment of thermal environmental conditions and quantification of thermal adaptation in naturally ventilated buildings in composite climate of India. Building and Environment, 86, 17–28. https://doi.org/10.1016/J.BUILDENV.2014.11.024	
12	ROMUdrea	Romani	Udrea, I., Croitoru, C., Nastase, I., Crutescu, R., & Badescu, V. (2018). First adaptive thermal comfort equation for naturally ventilated buildings in Bucharest, Romania. International Journal of Ventilation, 17(3), 149–165. https://doi.org/10.1080/14733315.	

- CAT: refers to the category of the thermal comfort model applied. Most of the Comfort Standards work with 80 and 90% acceptability levels, except the European EN 16798-1 (works with Categories 1, 2 and 3), the Chinese GB/T 50785 (works with categories 1 and 2), and the India Model for Adaptive Comfort - Commercial (which works with 80, 85 and 90% acceptability levels). So, for example, if you are going to use the EN16798-1 (ComfStand = 1), you can enter '1 2 3' to generate setpoint temperatures for Categories 1, 2 and 3. Or, if you are going to use the IMAC Commercial in naturally ventilated mode (ComfStand = 7), you can enter '80 85 90' to generate setpoint temperatures for these acceptability levels. All categories are referenced in the full list of setpoint temperatures at the end of this section. Please note that the Category values must be consistent with the Comfort Standard values previously entered. If, for instance, you enter '1' in the Comfort Standard value (means you're asking for EN16798 model), but then enter '80' or '90' in the Category value (which are categories used in ASHRAE55), you won't get the results you want.
- ComfMod: is the Comfort Mode, and refers to the setpoint behaviour. It controls if the setpoints are static (when ComfMod = 0 or 0.X) or adaptive (when ComfMod = 1 or 1.X, 2 or 3). When they are adaptive, it also controls the comfort model applied when the adaptive model is not applicable (that is, when the running mean outdoor temperature limits are exceeded), in which case a PMV-based model is applied. Each ComfMod for each ComfStand and CAT is referenced at the full list of setpoint temperatures. Please refer to the research article https://www.mdpi.com/1996-1073/12/8/1498 for more information. Figure below shows the variation of setpoint temperatures when ComfMod 0 (upper left), 1 (upper right), 2 (lower left) and 3 (lower right), when ComfStand is 1 (EN 16798-1, although figure shows the superseded standard, but the setpoint behaviour is similar)
- SetpointAcc: refers to the accuracy of the setpoint temperatures. Any number, integer or float, can be entered in this argument. For instance, if 1 was entered, the cooling setpoint would be rounded to the nearest integer below adaptive upper comfort limit minus tolerance (ASTtol), and the heating setpoint would be rounded to the nearest integer above adaptive lower comfort limit plus tolerance. If 27.46 and 20.46 were the upper and lower comfort limits and its tolerances were respectively -0.1 and +0.1, then the nearest integers to 27.36 and 20.56 would be 27 and 21, and therefore, these would be the cooling and heating setpoint temperatures. If 2 was used instead, then the rounding would be done to the nearest half. If 10 were used, the rounding would be done to the first decimal. If 0.5 or 0.1 were used, the rounding would be done respectively every 2 or 10 celsius degrees.
- CoolSeasonStart: it is the start of the cooling season, only used when EN16798-1, ASHRAE 55 or ISO7730 are entered in ComfStand (respectively, ComfStand = 1, 2 and 22) and setpoint behaviour is set to static (i.e. ComfMod = 0). This argument can take the number of the day in the year (i.e. an integer) or a string containing a date in format dd/mm (for instance, "01/05"). Values of CoolSeasonStart greater than CoolSeasonEnd can be used, therefore denoting the location of the EPW file should be in the south hemisphere.
- CoolSeasonEnd: Similar to CoolSeasonStart, but it is the end of the cooling season. Again, only used when EN16798-1, ASHRAE 55 or ISO7730 are entered in ComfStand (respectively, ComfStand = 1, 2 and 22) and setpoint behaviour is set to static (i.e. ComfMod = 0). Again, this argument can take the number of the day in the year (i.e. an integer) or a string containing a date in format dd/mm (for instance, "01/05"). Values of CoolSeasonEnd smaller than CoolSeasonStart can be used, therefore denoting the location of the EPW file should be in the south hemisphere.
- HVACmode: refers to the HVAC mode applied. Enter 0 for Fully Air-conditioned (AC), 1 for Naturally ventilated (NV) and/or 2 for Mixed Mode (MM). Please note that Calculated natural ventilation must be enabled so that Mixed Mode works. So, for example, if you enter '0 1 2' you'll be getting all HVAC modes, or if you just enter '0 1' you'll be getting just Fully Air-conditioned and Naturally ventilated.
- VentCtrl: refers to the ventilation control, only used in for NV and MM. When using NV, If you enter '0', ventilation will be allowed if operative temperature exceeds neutral temperature (also known as comfort temperature); if you enter '1', ventilation will be allowed if operative temperature exceeds the upper comfort limit. In other words, sets the value of the neutral temperature or the upper comfort limit to the Ventilation Setpoint Temperature (VST). When using MM, 0 = Ventilates above neutral temperature and fully opens doors and windows; 1 = Ventilates above lower comfort limit and fully opens doors and windows; 2 = Ventilates above neutral temperature and opens doors and windows based on the customised venting opening factor; and 3 = Ventilates above lower comfort limit and opens doors and windows based on the customised venting opening factor. Either way,


CTE
OUT-CTE
OUT-SEN15251
OUT-AEN15251
indoor operative temperature (ºC)
mean outdoor temperature (ºC)
upper limit
lower limit

if you enter '0 1' you'll be getting both ventilation control modes.

- MaxTempDiffVOF: Maximum Temperature Difference for Venting Opening Factor. Maximum temperature difference between indoor operative and outdoor temperatures, which when exceeded, windows and doors are opened only the fraction specified in the MultiplierVOF argument. If temperature difference oscillates between maximum and minimum, the windows and doors are opened based on the linear equation. Follows the same operation as explained in Designbuilder help website.
- MinTempDiffVOF: Minimum Temperature Difference for Venting Opening Factor. Minimum temperature difference between indoor operative and outdoor temperatures, which when smaller, windows and doors are fully opened. If temperature difference oscillates between maximum and minimum, the windows and doors are opened based on the linear equation. Follows the same operation as explained in Designbuilder help website.
- MultiplierVOF: Multiplier for modulating the Venting Opening Factor. The fraction of the windows that will be opened when temperature difference exceeds MaxTempDiffVOF. Follows the same operation as explained in Designbuilder help website.



- VSToffset: stands for Ventilation Setpoint Temperature (VST) offset, again only used in Mixed Mode (HVAC Mode '2'). Applies the entered values as an offset to the VST, in Celsius degrees. Values entered can be positive or negative float or integers, and must be space-separated. For example, if you enter '-2 -1 0 1 2' you'll be getting offsets of -2°C, -1°C, 0°C, 1°C and 2°C to the VST. If you don't enter any number, it'll be used '0' as the default value.
- MinOToffset: stands for Minimum Outdoor Temperature offset, again only used in Mixed Mode (HVAC Mode '2'). Sets the minimum outdoor temperature an offset to the heating setpoint temperature. For example, if you enter '1' (please, note that the numbers must be positive), ventilation won't be allowed if outdoor temperature falls below 1°C below the heating setpoint, in order to prevent from entering excessive cold. Therefore, below said limit, windows are closed and, if needed, air conditioning starts to work. Entered values can be float or integers, but always positive numbers, and must be space-separated. For example, if you enter '0 1 2' you'll be getting offsets of 0°C, 1°C and 2°C to the heating setpoint temperature. If you don't enter any number, it'll be used '50' as the default value (that is 50°C below heating setpoint temperature, and therefore no limit is applied).
- MaxWindSpeed: stands for maximum wind speed, again only used in Mixed Mode (HVAC Mode '2'). Sets the maximum wind speed in which ventilation is allowed, in m/s. Therefore, if you enter '20', ventilation won't be allowed if wind speed is greater than 20 m/s. Entered values can be float or integers, but always positive numbers, and must be space-separated. For example, if you enter '5 10 15 20' you'll be getting different IDFs with maximum wind speeds of 5 m/s, 10 m/s, 15 m/s and 20 m/s. If you don't enter any number, it'll be used '50' as the default value (that is 50 m/s, and therefore no limit is applied).

- ASTtol: stands for Adaptive Setpoint Temperature tolerance. It applies the number that you enter as a tolerance for the adaptive heating and cooling setpoint temperatures. The original problem was that, if we assigned the adaptive setpoint straight to the comfort limit (i.e. you enter '0' for ASTtol), there were a few hours that fell outside the comfort zone because of the error in some decimals in the simulation of the operative temperature. Therefore, the original purpose of this feature is to control that all hours are comfortable hours (i.e. operative temperature falls within the comfort zone), and we can make that sure by considering a little tolerance of 0.10 °C. For example, say that adaptive cooling and heating setpoints are originally 29.5 and 21.5°C at some day; if you enter '1' for ASTtol, then the setpoints would be modified to 28.5 and 22.5°C (1°C below original cooling setpoint, and 1°C above original heating setpoint). The function will create a sequence of numbers based on the entered values. So, numbers must be entered in 3 stages: first, the start of the sequence; second, the end of the sequence, and third, the steps. So for example, if you enter '0' for the start, '1' for the end, and '0.25' for the steps, you would be getting ASTtol values of 0°C, 0.25°C, 0.5°C, 0.75°C and 1°C. If you don't enter any number, it'll be used '0.1' as the default value (as previously said, to make sure all hours are comfortable hours), and you would be getting only one variation of 0.1°C.
- NameSuffix: the text you would like to add at the end of the file name.
- verboseMode: True to print all process in screen, False to not to print it. Default is True.
- confirmGen: Generally, this argument should be left as default. True to confirm automatically the generation of IDFs; if False, you'll be asked to confirm in command prompt. Default is False. So, if you are going to set it True, be sure about the number of IDFs you are going to generate, because these might be thousands.

So, below you can see a sample name of an IDF created by using accim's VRFsystem functions. The package takes the original IDF file as a reference, saves a copy, run all the functions so that setpoint temperatures are transformed from static to adaptive, an changes its name based on the values previously entered:

TestModel_onlyGeometryForVRFsystem[CS_INT EN16798[CA_1[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[sta

where:

- 'TestModel_onlyGeometryForVRFsystem' is the name of the original IDF.
- CS refers to the Comfort Standard, and it's followed by the thermal comfort standard applied (could be 'ESP CTE', 'INT EN16798', 'INT ASHRAE55', 'JPN Rijal', etc).
- CA refers to the Category, which could be 1, 2 or 3 if CS is EN16798, 80 or 90 if CS is ASHRAE55 or other models, or 80, 85 or 90 in case of the IMAC C.
- CM refers to the Comfort Mode, which could be 0 (Static), 1, 2, or 3 (Adaptive modes).
- HM refers to the HVAC Mode, which could be 0 (Full air conditioning), 1 (Naturally ventilated), or 2 (Mixed Mode).
- VC refers to the Ventilation Control, which could be 0, 1, 2 or 3.
- VO refers to the Ventilation setpoint temperature offset, which could be any number, float or integer, positive or negative.
- MT refers to the Minimum Outdoor Temperature offset, which could be any number, float or integer, but always positive number.
- MW refers to the Maximum Wind Speed, which could be any number, float or integer, but always positive number.
- AT refers to the Adaptive Setpoint Temperature offset, which could be any number, float or integer, but always positive number. Please remember this number comes from a 3-stage process (refer to the explanation above).
- 'standard' is the suffix, which can be whatever you want. For example, this allows you to make a for loop with 'standard', 'simplified' and 'timestep' and run the simulations with all type of outputs.

If some inputs are not used or don't make sense, you'll be able to se an 'X' in the output IDF file. For example, if you use CTE as Comfort Standard, then the inputs for Category and Comfort Mode (which are only for EN16798-1 and ASHRAE 55) are not used in the process, and the output IDF would contain in its name 'CS_ESP CTE[CA_X[CM_X'.

Another similar case occurs if you use Full air-conditioning HVAC Mode (i.e. enter '0' for HVAC Mode), or if you use the 'ex_ac' ScriptType, where the output IDF would contain in its name '[HM_0[VC_X[VO_X[MT_X[MW_X'.

4.3 4.3 Full list of setpoint temperatures

Depending on the arguments ComfStand, CAT and ComfMod, cooling and heating setpoint temperatures will be the following:

(If it is too small, you can look at it also at the Github repository)

4.4 4.4 Putting it into practice: Adaptive setpoint temperatures step by step

You can see a Jupyter Notebook either in the How-to Guide section of this documentation or in the link below:

https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_notebooks/addAccis/using_addAccis.ipynb

You can also execute it at your computer. You just need to find the folder containing the .ipynb and all other files at the accim package folder within your site_packages path, in

accim/sample_files/jupyter_notebooks/addAccis

The path should be something like this, with your username instead of YOUR_USERNAME:

C:\Users\YOUR_USERNAME\AppData\Local\Programs\Python\Python39\Lib\site-packages\accim\sample_files\jupyter_notebooks\add

Then, you just need to copy the folder to a different path (i.e. Desktop), open a cmd dialog pointing at it, and run "jupyter notebook". After that, an internet browser will pop up, and you will be able to open the .ipynb file.

You can also see an example below. The input file is included within `accim/sample_files/sample IDFs` folder, and it was originally named `TestModel_onlyGeometryForVRFsystem_2zones_CalcVent_V2310.idf`, but for clarity purposes in this case has been renamed to "TestModel.idf".

So, say you have an IDF in some folder, called 'TestModel.idf'. So, you can either open an IDE or simply a CMD dialog pointing at that path and execute python. Let's run the functions to get the energy models with adaptive setpoint temperatures.

```
>>> from accim.sim import accis
>>> accis.addAccis()
```

When we hit enter, we'll be asked to enter some information regarding the ScriptType, the Outputs and the EnergyPlus version:

```
------------------------------------------------------------
Adaptive-Comfort-Control-Implemented Model (ACCIM)
------------------------------------------------------------

This tool allows to apply adaptive setpoint temperatures.
For further information, please read the documentation:
https://accim.readthedocs.io/en/master/
For a visual understanding of the tool, please visit the following jupyter notebooks:
-    Using addAccis() to apply adaptive setpoint temperatures
https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_
```

(continues on next page)

ComfStand		CAT	ComfMod	PMV-based model when adaptive is not applicable	Season / Climate zone	Cooling setpoint temperature (°C)			Heating setpoint temperature (°C)		
						WMOT < ACSTall	ACSTall < WMOT < ACSTaul	ACSTaul < WMOT	WMOT < AHSTall	AHSTall < WMOT < AHSTaul	AHSTaul < WMOT
0	CTE	NA	NA			23:00-08:00h: 27 / 08:00-23:00h: 25			23:00-08:00h: 17 / 08:00-23:00h: 20		
1	INT EN16798-1	1	0		SS	25.5			23.5		
					WS	25			21		
			1	Spanish Building Code	All	27-25	RMOT*0.33+18.8+2	27-25	17-20	RMOT*0.33+18.8-3	17-20
			2	EN16798-1 Static	All	25	RMOT*0.33+18.8+2	25.5	21	RMOT*0.33+18.8-3	23.5
			3	Adap. Limits Horizont. Extended	All	10*0.33+18.8+2	RMOT*0.33+18.8+2	30*0.33+18.8+2	10*0.33+18.8-3	RMOT*0.33+18.8-3	30*0.33+18.8-3
		2	0		SS	26			23		
					WS	25			20		
			1	Spanish Building Code	All	27-25	RMOT*0.33+18.8+3	27-25	17-20	RMOT*0.33+18.8-4	17-20
			2	EN16798-1 Static	All	25	RMOT*0.33+18.8+3	26	20	RMOT*0.33+18.8-4	23
			3	Adap. Limits Horizont. Extended	All	10*0.33+18.8+3	RMOT*0.33+18.8+3	30*0.33+18.8+3	10*0.33+18.8-4	RMOT*0.33+18.8-4	30*0.33+18.8-4
		3	0		SS	27			22		
					WS	25			18		
			1	Spanish Building Code	All	27-25	RMOT*0.33+18.8+4	27-25	17-20	RMOT*0.33+18.8-5	17-20
			2	EN16798-1 Static	All	25	RMOT*0.33+18.8+4	27	18	RMOT*0.33+18.8-5	22
			3	Adap. Limits Horizont. Extended	All	10*0.33+18.8+4	RMOT*0.33+18.8+4	30*0.33+18.8+4	10*0.33+18.8-5	RMOT*0.33+18.8-5	30*0.33+18.8-5
2	INT ASHRAE55	80	0		SS	27			22		
					WS	25			19		
			1	CTE	All	27-25	PMOT*0.31+17.8+3.5	27-25	17-20	PMOT*0.31+17.8-3.5	17-20
			2	ISO 7730	All	25	PMOT*0.31+17.8+3.5	27	19	PMOT*0.31+17.8-3.5	22
			3	Adap. Limits Horizont. Extended	All	10*0.31+17.8+3.5	PMOT*0.31+17.8+3.5	33.5*0.31+17.8+3.5	10*0.31+17.8-3.5	PMOT*0.31+17.8-3.5	33.5*0.31+17.8-3.5
		90	0		SS	26			23		
					WS	24			20		
			1	CTE	All	27-25	PMOT*0.31+17.8+2.5	27-25	17-20	PMOT*0.31+17.8-2.5	17-20
			2	ISO 7730	All	24	PMOT*0.31+17.8+2.5	26	20	PMOT*0.31+17.8-2.5	23
			3	Adap. Limits Horizont. Extended	All	10*0.31+17.8+2.5	PMOT*0.31+17.8+2.5	33.5*0.31+17.8+2.5	10*0.31+17.8-2.5	PMOT*0.31+17.8-2.5	33.5*0.31+17.8-2.5
3	JPN Rijal	80	0		All	28			18		
			1	COOLBIZ	All	28	PMOT*0.48+14.4+3.5	28	18	PMOT*0.48+14.4-3.5	18
			2	ISO 7730	All	25	PMOT*0.48+14.4+3.5	27	19	PMOT*0.48+14.4-3.5	22
			3	Adap. Limits Horizont. Extended	All	5*0.48+14.4+3.5	PMOT*0.48+14.4+3.5	30*0.48+14.4+3.5	5*0.48+14.4-3.5	PMOT*0.48+14.4-3.5	30*0.48+14.4-3.5
		90	0		All	27			19		
			1	COOLBIZ	All	27	PMOT*0.48+14.4+2.5	27	19	PMOT*0.48+14.4-2.5	19
			2	ISO 7730	All	24	PMOT*0.48+14.4+2.5	26	20	PMOT*0.48+14.4-2.5	23
			3	Adap. Limits Horizont. Extended	All	5*0.48+14.4+2.5	PMOT*0.48+14.4+2.5	30*0.48+14.4+2.5	5*0.48+14.4-2.5	PMOT*0.48+14.4-2.5	30*0.48+14.4-2.5
4	CHN GB/T 50785 - Cold	1 (90%)	-	Adap. Limits Horizont. Extended	All	18*0.77+12.04	PMOT*0.77+12.04	28*0.77+12.04	18*0.87+2.76	PMOT*0.87+2.76	28*0.87+2.76
		2 (75-90%)	-	Adap. Limits Horizont. Extended	All	18*0.73+15.28	PMOT*0.73+15.28	30*0.73+15.28	16*0.91-0.48	PMOT*0.91-0.48	28*0.91-0.48
5	CHN GB/T 50785 - Hot & Mild	1 (90%)	-	Adap. Limits Horizont. Extended	All	18*0.77+9.34	PMOT*0.77+9.34	28*0.77+9.34	18*0.87-0.31	PMOT*0.87-0.31	28*0.87-0.31
		2 (75-90%)	-	Adap. Limits Horizont. Extended	All	18*0.73+12.72	PMOT*0.73+12.72	30*0.73+12.72	16*0.91-3.69	PMOT*0.91-3.69	28*0.91-3.69
6	CHN Yang	80	0		All	?			?		
			1		All	?	?	?	?	?	?
			2	ISO 7730	All	25	PMOT*0.30+25.9	27	19	PMOT*0.32+14.88	22
			3	Adap. Limits Horizont. Extended	All	-7*0.30+25.9	PMOT*0.30+25.9	30*0.30+25.9	-7*0.32+14.88	PMOT*0.32+14.88	30*0.32+14.88
		90	0		All	?			?		
			1		All	?	?	?	?	?	?
			2	ISO 7730	All	24	PMOT*0.30+23.6	26	20	PMOT*0.31+17.14	23
			3	Adap. Limits Horizont. Extended	All	-7*0.30+23.6	PMOT*0.30+23.6	30*0.30+23.6	-7*0.31+17.14	PMOT*0.31+17.14	30*0.31+17.14
7	IND IMAC C NV	80	0		All	PMOT*0.078+23.25+2.72			PMOT*0.078+23.25-2.72		
			1	Indian Building Code	All	PMOT*0.078+23.25+2.72	PMOT*0.54+12.83+4.1	PMOT*0.078+23.25+2.72	PMOT*0.078+23.25-2.72	PMOT*0.54+12.83-4.1	PMOT*0.078+23.25-2.72
			2	ISO 7730	All	25	PMOT*0.54+12.83+4.1	27	19	PMOT*0.54+12.83-4.1	22
			3	Adap. Limits Horizont. Extended	All	12.5*0.54+12.83+4.1	PMOT*0.54+12.83+4.1	31*0.54+12.83+4.1	12.5*0.54+12.83-4.1	PMOT*0.54+12.83-4.1	31*0.54+12.83-4.1
		85	0		All	PMOT*0.078+23.25+2.11			PMOT*0.078+23.25-2.11		
			1	Indian Building Code	All	PMOT*0.078+23.25+2.11	PMOT*0.54+12.83+3.3	PMOT*0.078+23.25+2.11	PMOT*0.078+23.25-2.11	PMOT*0.54+12.83-3.3	PMOT*0.078+23.25-2.11
			2	ISO 7730	All	24.5	PMOT*0.54+12.83+3.3	26.5	19.5	PMOT*0.54+12.83-3.3	22.5
			3	Adap. Limits Horizont. Extended	All	12.5*0.54+12.83+3.3	PMOT*0.54+12.83+3.3	31*0.54+12.83+3.3	12.5*0.54+12.83-3.3	PMOT*0.54+12.83-3.3	31*0.54+12.83-3.3
		90	0		All	PMOT*0.078+23.25+1.5			PMOT*0.078+23.25-1.5		
			1	Indian Building Code	All	PMOT*0.078+23.25+1.5	PMOT*0.54+12.83+2.4	PMOT*0.078+23.25+1.5	PMOT*0.078+23.25-1.5	PMOT*0.54+12.83-2.4	PMOT*0.078+23.25-1.5
			2	ISO 7730	All	24	PMOT*0.54+12.83+2.4	26	20	PMOT*0.54+12.83-2.4	23
			3	Adap. Limits Horizont. Extended	All	12.5*0.54+12.83+2.4	PMOT*0.54+12.83+2.4	31*0.54+12.83+2.4	12.5*0.54+12.83-2.4	PMOT*0.54+12.83-2.4	31*0.54+12.83-2.4
8	IND IMAC C MM	80	0		All	PMOT*0.078+23.25+2.72			PMOT*0.078+23.25-2.72		
			1	Indian Building Code	All	PMOT*0.078+23.25+2.72	PMOT*0.28+17.87+5.9	PMOT*0.078+23.25+2.72	PMOT*0.078+23.25-2.72	PMOT*0.28+17.87-5.9	PMOT*0.078+23.25-2.72
			2	ISO 7730	All	25	PMOT*0.28+17.87+5.9	27	19	PMOT*0.28+17.87-5.9	22
			3	Adap. Limits Horizont. Extended	All	13*0.28+17.87+5.9	PMOT*0.28+17.87+5.9	38.5*0.28+17.87+5.9	13*0.28+17.87-5.9	PMOT*0.28+17.87-5.9	38.5*0.28+17.87-5.9
		85	0		All	PMOT*0.078+23.25+2.11			PMOT*0.078+23.25-2.11		
			1	Indian Building Code	All	PMOT*0.078+23.25+2.11	PMOT*0.28+17.87+4.8	PMOT*0.078+23.25+2.11	PMOT*0.078+23.25-2.11	PMOT*0.28+17.87-4.8	PMOT*0.078+23.25-2.11
			2	ISO 7730	All	24.5	PMOT*0.28+17.87+4.8	26.5	19.5	PMOT*0.28+17.87-4.8	22.5
			3	Adap. Limits Horizont. Extended	All	13*0.28+17.87+4.8	PMOT*0.28+17.87+4.8	38.5*0.28+17.87+4.8	13*0.28+17.87-4.8	PMOT*0.28+17.87-4.8	38.5*0.28+17.87-4.8
		90	0		All	PMOT*0.078+23.25+1.5			PMOT*0.078+23.25-1.5		
			1	Indian Building Code	All	PMOT*0.078+23.25+1.5	PMOT*0.28+17.87+3.5	PMOT*0.078+23.25+1.5	PMOT*0.078+23.25-1.5	PMOT*0.28+17.87-3.5	PMOT*0.078+23.25-1.5
			2	ISO 7730	All	24	PMOT*0.28+17.87+3.5	26	20	PMOT*0.28+17.87-3.5	23
			3	Adap. Limits Horizont. Extended	All	13*0.28+17.87+3.5	PMOT*0.28+17.87+3.5	38.5*0.28+17.87+3.5	13*0.28+17.87-3.5	PMOT*0.28+17.87-3.5	38.5*0.28+17.87-3.5
9	IND IMAC R 7DRM	80	0		All	PMOT*0.078+23.25+2.72			PMOT*0.078+23.25-2.72		
			1	Indian Building Code	All	PMOT*0.078+23.25+2.72	PMOT*0.39+18.42+3.6	PMOT*0.078+23.25+2.72	PMOT*0.078+23.25-2.72	PMOT*0.39+18.42-3.6	PMOT*0.078+23.25-2.72
			2	ISO 7730	All	25	PMOT*0.39+18.42+3.6	27	19	PMOT*0.39+18.42-3.6	22
			3	Adap. Limits Horizont. Extended	All	5.5*0.39+18.42+3.6	PMOT*0.39+18.42+3.6	33*0.39+18.42+3.6	5.5*0.39+18.42-3.6	PMOT*0.39+18.42-3.6	33*0.39+18.42-3.6
		90	0		All	PMOT*0.078+23.25+1.5			PMOT*0.078+23.25-1.5		
			1	Indian Building Code	All	PMOT*0.078+23.25+1.5	PMOT*0.39+18.42+2.15	PMOT*0.078+23.25+1.5	PMOT*0.078+23.25-1.5	PMOT*0.39+18.42-2.15	PMOT*0.078+23.25-1.5
			2	ISO 7730	All	24	PMOT*0.39+18.42+2.15	26	20	PMOT*0.39+18.42-2.15	23
			3	Adap. Limits Horizont. Extended	All	5.5*0.39+18.42+2.15	PMOT*0.39+18.42+2.15	33*0.39+18.42+2.15	5.5*0.39+18.42-2.15	PMOT*0.39+18.42-2.15	33*0.39+18.42-2.15
10	IND IMAC R 30DRM	80	0		All	RMOT*0.078+23.25+2.72			RMOT*0.078+23.25-2.72		
			1	Indian Building Code	All	RMOT*0.078+23.25+2.72	RMOT*0.42+17.6+3.6	RMOT*0.078+23.25+2.72	RMOT*0.078+23.25-2.72	RMOT*0.42+17.6-3.6	RMOT*0.078+23.25-2.72
			2	ISO 7730	All	25	RMOT*0.42+17.6+3.6	27	19	RMOT*0.42+17.6-3.6	22
			3	Adap. Limits Horizont. Extended	All	5.5*0.42+17.6+3.6	RMOT*0.42+17.6+3.6	33*0.42+17.6+3.6	5.5*0.42+17.6-3.6	RMOT*0.42+17.6-3.6	33*0.42+17.6-3.6
		90	0		All	RMOT*0.078+23.25+1.5			RMOT*0.078+23.25-1.5		
			1	Indian Building Code	All	RMOT*0.078+23.25+1.5	RMOT*0.42+17.6+2.15	RMOT*0.078+23.25+1.5	RMOT*0.078+23.25-1.5	RMOT*0.42+17.6-2.15	RMOT*0.078+23.25-1.5
			2	ISO 7730	All	24	RMOT*0.42+17.6+2.15	26	20	RMOT*0.42+17.6-2.15	23
			3	Adap. Limits Horizont. Extended	All	5.5*0.42+17.6+2.15	RMOT*0.42+17.6+2.15	33*0.42+17.6+2.15	5.5*0.42+17.6-2.15	RMOT*0.42+17.6-2.15	33*0.42+17.6-2.15
11	IND Dhaka	80	0		All	RMOT*0.078+23.25+2.72			RMOT*0.078+23.25-2.72		
			1	Indian Building Code	All	RMOT*0.078+23.25+2.72	RMOT*0.75+5.37+3.5	RMOT*0.078+23.25+2.72	RMOT*0.078+23.25-2.72	RMOT*0.75+5.37-3.5	RMOT*0.078+23.25-2.72
			2	ISO 7730	All	25	RMOT*0.75+5.37+3.5	27	19	RMOT*0.75+5.37-3.5	22
			3	Adap. Limits Horizont. Extended	All	?*0.75+5.37+3.5	RMOT*0.75+5.37+3.5	?*0.75+5.37+3.5	?*0.75+5.37-3.5	RMOT*0.75+5.37-3.5	?*0.75+5.37-3.5
		90	0		All	RMOT*0.078+23.25+1.5			RMOT*0.078+23.25-1.5		
			1	Indian Building Code	All	RMOT*0.078+23.25+1.5	RMOT*0.75+5.37+2.5	RMOT*0.078+23.25+1.5	RMOT*0.078+23.25-1.5	RMOT*0.75+5.37-2.5	RMOT*0.078+23.25-1.5
			2	ISO 7730	All	24	RMOT*0.75+5.37+2.5	26	20	RMOT*0.75+5.37-2.5	23
			3	Adap. Limits Horizont. Extended	All	?*0.75+5.37+2.5	RMOT*0.75+5.37+2.5	?*0.75+5.37+2.5	?*0.75+5.37-2.5	RMOT*0.75+5.37-2.5	?*0.75+5.37-2.5
12	ROM Udrea	80	0		All	27			20		
			1	Romanian Building Code	All	27	PMOT*0.25+19.7+2.89	27	20	PMOT*0.25+19.7-2.89	20
			2	ISO 7730	All	25	PMOT*0.25+19.7+2.89	27	19	PMOT*0.25+19.7-2.89	22
			3	Adap. Limits Horizont. Extended	All	10*0.25+19.7+2.89	PMOT*0.25+19.7+2.89	33.5*0.25+19.7+2.89	10*0.25+19.7-2.89	PMOT*0.25+19.7-2.89	33.5*0.25+19.7-2.89
		90	0		All	25.5			21.5		
			1	Romanian Building Code	All	25.5	PMOT*0.25+19.7+1.7	25.5	21.5	PMOT*0.25+19.7-1.7	21.5
			2	ISO 7730	All	24	PMOT*0.25+19.7+1.7	26	20	PMOT*0.25+19.7-1.7	23
			3	Adap. Limits Horizont. Extended	All	10*0.25+19.7+1.7	PMOT*0.25+19.7+1.7	33.5*0.25+19.7+1.7	10*0.25+19.7-1.7	PMOT*0.25+19.7-1.7	33.5*0.25+19.7-1.7
13	AUS Williamson	80	0.1		CZ1, 2, 3	6:00 to 23:00: 27; else: 24			6:00 to 12:00: 20; else: 18		
			0.2		CZ4	6:00 to 23:00: 26; else: 24			6:00 to 12:00: 20; else: 18		
			0.3		CZ5	6:00 to 23:00: 25; else: 24			6:00 to 12:00: 20; else: 18		
			0.4		CZ6, 7	6:00 to 23:00: 24; else: 24			6:00 to 12:00: 20; else: 18		
			0.5		CZ8	6:00 to 23:00: 23; else: 24			6:00 to 12:00: 20; else: 18		
			1.1	Australian Building Code	CZ1, 2, 3	6 to 23h: 27; else: 24	RMOT*0.26+15.9+4.55	6 to 23h: 27; else: 24	6 to 12am: 20; else: 18	RMOT*0.26+15.9-4.55	6 to 12am: 20; else: 18
			1.2	Australian Building Code	CZ4	6 to 23h: 26; else: 24	RMOT*0.26+15.9+4.55	6 to 23h: 26; else: 24	6 to 12am: 20; else: 18	RMOT*0.26+15.9-4.55	6 to 12am: 20; else: 18
			1.3	Australian Building Code	CZ5	6 to 23h: 25; else: 24	RMOT*0.26+15.9+4.55	6 to 23h: 25; else: 24	6 to 12am: 20; else: 18	RMOT*0.26+15.9-4.55	6 to 12am: 20; else: 18
			1.4	Australian Building Code	CZ6, 7	6 to 23h: 24; else: 24	RMOT*0.26+15.9+4.55	6 to 23h: 24; else: 24	6 to 12am: 20; else: 18	RMOT*0.26+15.9-4.55	6 to 12am: 20; else: 18
			1.5	Australian Building Code	CZ8	6 to 23h: 23; else: 24	RMOT*0.26+15.9+4.55	6 to 23h: 23; else: 24	6 to 12am: 20; else: 18	RMOT*0.26+15.9-4.55	6 to 12am: 20; else: 18
			2	ISO 7730	All	25	RMOT*0.26+15.9+4.55	27	19	RMOT*0.26+15.9-4.55	22
			3	Adap. Limits Horizont. Extended	All	10*0.26+15.9+4.55	RMOT*0.26+15.9+4.55	25*0.26+15.9+4.55	10*0.26+15.9-4.55	RMOT*0.26+15.9-4.55	25*0.26+15.9-4.55
		90	0.1		CZ1, 2, 3	6:00 to 23:00: 26; else: 23			6:00 to 12:00: 21; else: 19		
			0.2		CZ4	6:00 to 23:00: 25; else: 23			6:00 to 12:00: 21; else: 19		
			0.3		CZ5	6:00 to 23:00: 24; else: 23			6:00 to 12:00: 21; else: 19		
			0.4		CZ6, 7	6:00 to 23:00: 23; else: 23			6:00 to 12:00: 21; else: 19		
			0.5		CZ8	6:00 to 23:00: 22; else: 23			6:00 to 12:00: 21; else: 19		
			1.1	Australian Building Code	CZ1, 2, 3	6 to 23h: 26; else: 23	RMOT*0.26+15.9+3.45	6 to 23h: 26; else: 23	6 to 12am: 21; else: 19	RMOT*0.26+15.9-3.45	6 to 12am: 21; else: 19
			1.2	Australian Building Code	CZ4	6 to 23h: 25; else: 23	RMOT*0.26+15.9+3.45	6 to 23h: 25; else: 23	6 to 12am: 21; else: 19	RMOT*0.26+15.9-3.45	6 to 12am: 21; else: 19
			1.3	Australian Building Code	CZ5	6 to 23h: 24; else: 23	RMOT*0.26+15.9+3.45	6 to 23h: 24; else: 23	6 to 12am: 21; else: 19	RMOT*0.26+15.9-3.45	6 to 12am: 21; else: 19
			1.4	Australian Building Code	CZ6, 7	6 to 23h: 23; else: 23	RMOT*0.26+15.9+3.45	6 to 23h: 23; else: 23	6 to 12am: 21; else: 19	RMOT*0.26+15.9-3.45	6 to 12am: 21; else: 19
			1.5	Australian Building Code	CZ8	6 to 23h: 22; else: 23	RMOT*0.26+15.9+3.45	6 to 23h: 22; else: 23	6 to 12am: 21; else: 19	RMOT*0.26+15.9-3.45	6 to 12am: 21; else: 19
			2	ISO 7730	All	24	RMOT*0.26+15.9+3.45	26	20	RMOT*0.26+15.9-3.45	23
			3	Adap. Limits Horizont. Extended	All	10*0.26+15.9+3.45	RMOT*0.26+15.9+3.45	25*0.26+15.9+3.45	10*0.26+15.9-3.45	RMOT*0.26+15.9-3.45	25*0.26+15.9-3.45
14	AUS DeDear	80	0.1		CZ1, 2, 3	6:00 to 23:00: 27; else: 24			6:00 to 12:00: 20; else: 18		
			0.2		CZ4	6:00 to 23:00: 26; else: 24			6:00 to 12:00: 20; else: 18		
			0.3		CZ5	6:00 to 23:00: 25; else: 24			6:00 to 12:00: 20; else: 18		
			0.4		CZ6, 7	6:00 to 23:00: 24; else: 24			6:00 to 12:00: 20; else: 18		
			0.5		CZ8	6:00 to 23:00: 23; else: 24			6:00 to 12:00: 20; else: 18		
			1.1	Australian Building Code	CZ1, 2, 3	6 to 23h: 27; else: 24	PMOT*0.26+16.75+4.5	6 to 23h: 27; else: 24	6 to 12am: 20; else: 18	PMOT*0.26+16.75-4.5	6 to 12am: 20; else: 18
			1.2	Australian Building Code	CZ4	6 to 23h: 26; else: 24	PMOT*0.26+16.75+4.5	6 to 23h: 26; else: 24	6 to 12am: 20; else: 18	PMOT*0.26+16.75-4.5	6 to 12am: 20; else: 18
			1.3	Australian Building Code	CZ5	6 to 23h: 25; else: 24	PMOT*0.26+16.75+4.5	6 to 23h: 25; else: 24	6 to 12am: 20; else: 18	PMOT*0.26+16.75-4.5	6 to 12am: 20; else: 18
			1.4	Australian Building Code	CZ6, 7	6 to 23h: 24; else: 24	PMOT*0.26+16.75+4.5	6 to 23h: 24; else: 24	6 to 12am: 20; else: 18	PMOT*0.26+16.75-4.5	6 to 12am: 20; else: 18
			1.5	Australian Building Code	CZ8	6 to 23h: 23; else: 24	PMOT*0.26+16.75+4.5	6 to 23h: 23; else: 24	6 to 12am: 20; else: 18	PMOT*0.26+16.75-4.5	6 to 12am: 20; else: 18
			2	ISO 7730	All	25	PMOT*0.26+16.75+4.5	27	19	PMOT*0.26+16.75-4.5	22
			3	Adap. Limits Horizont. Extended	All	8*0.26+16.75+4.5	PMOT*0.26+16.75+4.5	27*0.26+16.75+4.5	8*0.26+16.75-4.5	PMOT*0.26+16.75-4.5	27*0.26+16.75-4.5
		90	0.1		CZ1, 2, 3	6:00 to 23:00: 26; else: 23			6:00 to 12:00: 21; else: 19		
			0.2		CZ4	6:00 to 23:00: 25; else: 23			6:00 to 12:00: 21; else: 19		
			0.3		CZ5	6:00 to 23:00: 24; else: 23			6:00 to 12:00: 21; else: 19		
			0.4		CZ6, 7	6:00 to 23:00: 23; else: 23			6:00 to 12:00: 21; else: 19		
			0.5		CZ8	6:00 to 23:00: 22; else: 23			6:00 to 12:00: 21; else: 19		
			1.1	Australian Building Code	CZ1, 2, 3	6 to 23h: 26; else: 23	PMOT*0.26+16.75+3.5	6 to 23h: 26; else: 23	6 to 12am: 21; else: 19	PMOT*0.26+16.75-3.5	6 to 12am: 21; else: 19
			1.2	Australian Building Code	CZ4	6 to 23h: 25; else: 23	PMOT*0.26+16.75+3.5	6 to 23h: 25; else: 23	6 to 12am: 21; else: 19	PMOT*0.26+16.75-3.5	6 to 12am: 21; else: 19
			1.3	Australian Building Code	CZ5	6 to 23h: 24; else: 23	PMOT*0.26+16.75+3.5	6 to 23h: 24; else: 23	6 to 12am: 21; else: 19	PMOT*0.26+16.75-3.5	6 to 12am: 21; else: 19
			1.4	Australian Building Code	CZ6, 7	6 to 23h: 23; else: 23	PMOT*0.26+16.75+3.5	6 to 23h: 23; else: 23	6 to 12am: 21; else: 19	PMOT*0.26+16.75-3.5	6 to 12am: 21; else: 19
			1.5	Australian Building Code	CZ8	6 to 23h: 22; else: 23	PMOT*0.26+16.75+3.5	6 to 23h: 22; else: 23	6 to 12am: 21; else: 19	PMOT*0.26+16.75-3.5	6 to 12am: 21; else: 19
			2	ISO 7730	All	24	PMOT*0.26+16.75+3.5	26	20	PMOT*0.26+16.75-3.5	23
			3	Adap. Limits Horizont. Extended	All	8*0.26+16.75+3.5	PMOT*0.26+16.75+3.5	27*0.26+16.75+3.5	8*0.26+16.75-3.5	PMOT*0.26+16.75-3.5	27*0.26+16.75-3.5
15	BRA Rupp NV	80	0		WS	23.5			21		
					SS	25.5			22.5		
			1	ABNT NBR 16401-2 Standard	All	23.5	PMOT*0.56+12.74+3.8	25.5	21	PMOT*0.56+12.74-3.8	22.5
			2	ISO 7730	All	25	PMOT*0.56+12.74+3.8	27	19	PMOT*0.56+12.74-3.8	22
			3	Adap. Limits Horizont. Extended	All	16.9*0.56+12.74+3.8	PMOT*0.56+12.74+3.8	24.8*0.56+12.74+3.8	16.9*0.56+12.74-3.8	PMOT*0.56+12.74-3.8	24.8*0.56+12.74-3.8
		90	0		WS	23			21.5		
					SS	25			23		
			1	ABNT NBR 16401-2 Standard	All	23	PMOT*0.56+12.74+2.8	25	21.5	PMOT*0.56+12.74-2.8	23
			2	ISO 7730	All	24	PMOT*0.56+12.74+2.8	26	20	PMOT*0.56+12.74-2.8	23
			3	Adap. Limits Horizont. Extended	All	16.9*0.56+12.74+2.8	PMOT*0.56+12.74+2.8	24.8*0.56+12.74+2.8	16.9*0.56+12.74-2.8	PMOT*0.56+12.74-2.8	24.8*0.56+12.74-2.8
16	BRA Rupp AC	80	0		WS	23.5			21		
					SS	25.5			22.5		
			1	ABNT NBR 16401-2 Standard	All	23.5	PMOT*0.09+22.32+2.1	25.5	21	PMOT*0.09+22.32-2.1	22.5
			2	ISO 7730	All	25	PMOT*0.09+22.32+2.1	27	19	PMOT*0.09+22.32-2.1	22
			3	Limits Horizont. Extended	All	16.4*0.09+22.32+2.1	PMOT*0.09+22.32+2.1	25.7*0.09+22.32+2.1	16.4*0.09+22.32-2.1	PMOT*0.09+22.32-2.1	25.7*0.09+22.32-2.1
		90	0		WS	23			21.5		
					SS	25			23		
			1	ABNT NBR 16401-2 Standard	All	25	PMOT*0.09+22.32+1.1	25	23	PMOT*0.09+22.32-1.1	23
			2	ISO 7730	All	24	PMOT*0.09+22.32+1.1	26	20	PMOT*0.09+22.32-1.1	23
			3	Limits Horizont. Extended	All	16.4*0.09+22.32+1.1	PMOT*0.09+22.32+1.1	25.7*0.09+22.32+1.1	16.4*0.09+22.32-1.1	PMOT*0.09+22.32-1.1	25.7*0.09+22.32-1.1
17	MEX Oropeza Arid	80	0		All	25			20		
			1	Relevant static setpoints for Mex	WS	25	PMOT*0.48+13.9+3	25	20	PMOT*0.48+13.9-3	20
					SS	25	PMOT*0.59+9.6+3	25	20	PMOT*0.59+9.6-3	20
			2	ISO 7730	WS	27	PMOT*0.48+13.9+3	25	19	PMOT*0.48+13.9-3	22
					SS	27	PMOT*0.59+9.6+3	25	19	PMOT*0.59+9.6-3	22
			3	Adap. Limits Horizont. Extended	WS	11.25*0.48+13.9+3	PMOT*0.48+13.9+3	25.25*0.48+13.9+3	11.25*0.48+13.9-3	PMOT*0.48+13.9-3	25.25*0.48+13.9-3
					SS	23*0.59+9.6+3	PMOT*0.59+9.6+3	45*0.59+9.6+3	23*0.59+9.6-3	PMOT*0.59+9.6-3	45*0.59+9.6-3
		90	0		All	25			20		
			1	Relevant static setpoints for Mex	WS	25	PMOT*0.48+13.9+2	25	20	PMOT*0.48+13.9-2	20
					SS	25	PMOT*0.59+9.6+2	25	20	PMOT*0.59+9.6-2	20
			2	ISO 7730	WS	26	PMOT*0.48+13.9+2	24	20	PMOT*0.48+13.9-2	23
					SS	26	PMOT*0.59+9.6+2	24	20	PMOT*0.59+9.6-2	23
			3	Adap. Limits Horizont. Extended	WS	11.25*0.48+13.9+2	PMOT*0.48+13.9+2	25.25*0.48+13.9+2	11.25*0.48+13.9-2	PMOT*0.48+13.9-2	25.25*0.48+13.9-2
					SS	23*0.59+9.6+2	PMOT*0.59+9.6+2	45*0.59+9.6+2	23*0.59+9.6-2	PMOT*0.59+9.6-2	45*0.59+9.6-2
18	MEX Oropeza DryTropic	80	0		All	25			20		
			1	Relevant static setpoints for Mex	WS	25	PMOT*0.84+5.3+3	25	20	PMOT*0.84+5.3-3	20
					SS	25	PMOT*0.96-3.6+3	25	20	PMOT*0.96-3.6-3	20
			2	ISO 7730	WS	27	PMOT*0.84+5.3+3	25	19	PMOT*0.84+5.3-3	22
					SS	27	PMOT*0.96-3.6+3	25	19	PMOT*0.96-3.6-3	22
			3	Adap. Limits Horizont. Extended	WS	15.5*0.84+5.3+3	PMOT*0.84+5.3+3	27.5*0.84+5.3+3	15.5*0.84+5.3-3	PMOT*0.84+5.3-3	27.5*0.84+5.3-3
					SS	23*0.96-3.6+3	PMOT*0.96-3.6+3	34*0.96-3.6+3	23*0.96-3.6-3	PMOT*0.96-3.6-3	34*0.96-3.6-3
		90	0		All	25			20		
			1	Relevant static setpoints for Mex	WS	25	PMOT*0.84+5.3+2	25	20	PMOT*0.84+5.3-2	20
					SS	25	PMOT*0.96-3.6+2	25	20	PMOT*0.96-3.6-2	20
			2	ISO 7730	WS	26	PMOT*0.84+5.3+2	24	20	PMOT*0.84+5.3-2	23
					SS	26	PMOT*0.96-3.6+2	24	20	PMOT*0.96-3.6-2	23
			3	Adap. Limits Horizont. Extended	WS	15.5*0.84+5.3+2	PMOT*0.84+5.3+2	27.5*0.84+5.3+2	15.5*0.84+5.3-2	PMOT*0.84+5.3-2	27.5*0.84+5.3-2
					SS	23*0.96-3.6+2	PMOT*0.96-3.6+2	34*0.96-3.6+2	23*0.96-3.6-2	PMOT*0.96-3.6-2	34*0.96-3.6-2
19	MEX Oropeza Temperate	80	0		All	25			20		
			1	Relevant static setpoints for Mex	WS	25	PMOT*0.27+17.9+2	25	20	PMOT*0.27+17.9-2	20
					SS	25	PMOT*0.53+10.3+1	25	20	PMOT*0.53+10.3-1	20
			2	ISO 7730	WS	27	PMOT*0.27+17.9+2	25	19	PMOT*0.27+17.9-2	22
					SS	27	PMOT*0.53+10.3+1	25	19	PMOT*0.53+10.3-1	22
			3	Adap. Limits Horizont. Extended	WS	5*0.27+17.9+2	PMOT*0.27+17.9+2	25.25*0.27+17.9+2	5*0.27+17.9-2	PMOT*0.27+17.9-2	25.25*0.27+17.9-2
					SS	11.75*0.53+10.3+1	PMOT*0.53+10.3+1	25.25*0.53+10.3+1	11.75*0.53+10.3-1	PMOT*0.53+10.3-1	25.25*0.53+10.3-1
		90	0		All	25			20		
			1	Relevant static setpoints for Mex	WS	25	PMOT*0.27+17.9+3	25	20	PMOT*0.27+17.9-3	20
					SS	25	PMOT*0.53+10.3+2	25	20	PMOT*0.53+10.3-2	20
			2	ISO 7730	WS	26	PMOT*0.27+17.9+3	24	20	PMOT*0.27+17.9-3	23
					SS	26	PMOT*0.53+10.3+2	24	20	PMOT*0.53+10.3-2	23
			3	Adap. Limits Horizont. Extended	WS	5*0.27+17.9+3	PMOT*0.27+17.9+3	25.25*0.27+17.9+3	5*0.27+17.9-3	PMOT*0.27+17.9-3	25.25*0.27+17.9-3
					SS	11.75*0.53+10.3+2	PMOT*0.53+10.3+2	25.25*0.53+10.3+2	11.75*0.53+10.3-2	PMOT*0.53+10.3-2	25.25*0.53+10.3-2
20	MEX Oropeza HumTropic	80	0		All	25			20		
			1	Relevant static setpoints for Mex	WS	25	PMOT*0.38+15.7+2	25	20	PMOT*0.38+15.7-2	20
					SS	25	PMOT*0.47+9.07+5	25	20	PMOT*0.47+9.07-5	20
			2	ISO 7730	WS	27	PMOT*0.38+15.7+2	25	19	PMOT*0.38+15.7-2	22
					SS	27	PMOT*0.47+9.07+5	25	19	PMOT*0.47+9.07-5	22
			3	Adap. Limits Horizont. Extended	WS	13*0.38+15.7+2	PMOT*0.38+15.7+2	29.75*0.38+15.7+2	13*0.38+15.7-2	PMOT*0.38+15.7-2	29.75*0.38+15.7-2
					SS	23*0.47+9.07+5	PMOT*0.47+9.07+5	45*0.47+9.07+5	23*0.47+9.07-5	PMOT*0.47+9.07-5	45*0.47+9.07-5
		90	0		All	25			20		
			1	Relevant static setpoints for Mex	WS	25	PMOT*0.38+15.7+3	25	20	PMOT*0.38+15.7-3	20
					SS	25	PMOT*0.47+9.07+6	25	20	PMOT*0.47+9.07-6	20
			2	ISO 7730	WS	26	PMOT*0.38+15.7+3	24	20	PMOT*0.38+15.7-3	23
					SS	26	PMOT*0.47+9.07+6	24	20	PMOT*0.47+9.07-6	23
			3	Adap. Limits Horizont. Extended	WS	13*0.38+15.7+3	PMOT*0.38+15.7+3	29.75*0.38+15.7+3	13*0.38+15.7-3	PMOT*0.38+15.7-3	29.75*0.38+15.7-3
					SS	23*0.47+9.07+6	PMOT*0.47+9.07+6	45*0.47+9.07+6	23*0.47+9.07-6	PMOT*0.47+9.07-6	45*0.47+9.07-6
21	CHL Perez-Fargallo	80	0	?	All	?			?		
			1	?	All	?	?	?	?	?	?
			2	ISO 7730	All	25	PMOT*0.678+13.51+4	27	19	PMOT*0.678+13.51-4	22
			3	Adap. Limits Horizont. Extended	All	6.5*0.678+13.51+4	PMOT*0.678+13.51+4	20*0.678+13.51+4	6.5*0.678+13.51-4	PMOT*0.678+13.51-4	20*0.678+13.51-4
		90	0	?	All	?			?		
			1	?	All	?	?	?	?	?	?
			2	ISO 7730	All	24	PMOT*0.678+13.51+2.5	26	20	PMOT*0.678+13.51-2.5	23
			3	Adap. Limits Horizont. Extended	All	6.5*0.678+13.51+2.5	PMOT*0.678+13.51+2.5	20*0.678+13.51+2.5	6.5*0.678+13.51-2.5	PMOT*0.678+13.51-2.5	20*0.678+13.51-2.5
22	INT ISO7730	1: A	0	-	WS	23			21		
				-	SS	25.5			23.5		
		2: B	0	-	WS	24			20		
				-	SS	26			23		
		3: C	0	-	WS	25			19		
				-	SS	27			22		

PMOT: Prevailing mean outdoor temperature; RMOT: Running mean outdoor temperature; WS: Winter season; SS: Summer season; NA: Not applicable;

ACSTall: Adaptive Cooling Setpoint Temperature applicability lower limit; ACSTaul: Adaptive Cooling Setpoint Temperature applicability upper limit;

AHSTall: Adaptive Heating Setpoint Temperature applicability lower limit; AHSTaul: Adaptive Heating Setpoint Temperature applicability upper limit;

WMOT: Weighted Mean Outdoor Temperature (can be either RMOT or PMOT)

?: Functions to be added

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```
↪notebooks/addAccis/using_addAccis.ipynb-    Using rename_epw_files() to rename the␣
↪EPWs for proper data analysis after simulation
https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_
↪notebooks/rename_epw_files/using_rename_epw_files.ipynb
-    Using runEp() to directly run simulations with EnergyPlus
https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_
↪notebooks/runEp/using_runEp.ipynb
-    Using the class Table() for data analysis
https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_
↪notebooks/Table/using_Table.ipynb

Starting with the process.

Now, you are going to be asked to enter some information for different arguments to␣
↪generate the output IDFs with adaptive setpoint temperatures.
If you are not sure about how to use these parameters, please take a look at the␣
↪documentation in the following link:
https://accim.readthedocs.io/en/master/4_detailed%20use.html

Please, enter the following information:

Enter the ScriptType (
for VRFsystem with full air-conditioning mode: vrf_ac;
for VRFsystem with mixed-mode: vrf_mm;
for ExistingHVAC with mixed mode: ex_mm;
for ExistingHVAC with full air-conditioning mode: ex_ac
): vrf_mm

Enter the SupplyAirTempInputMethod (
for Supply Air Temperature: supply air temperature;
for Temperature Difference: temperature difference;
): temperature difference

Do you want to keep the existing outputs (true or false)?: false

Enter the Output type (standard, simplified, detailed or custom): standard

Enter the Output frequencies separated by space (timestep, hourly, daily, monthly,␣
↪runperiod): hourly runperiod

Do you want to generate a dataframe to see all outputs? (true or false): false

Enter the EnergyPlus version (9.1 to 23.1): 23.1

Enter the Temperature Control method (temperature or pmv): temperature
```

When we hit enter, it's going to add all the EnergyPlus objects needed:

```
Basic input data:
ScriptType is: vrf_mm
Supply Air Temperature Input Method is: temperature difference
Output type is: standard
```

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```
Output frequencies are:
['hourly', 'runperiod']
EnergyPlus version is: 23.1
Temperature Control method is: temperature

=======================START OF GENERIC IDF FILE GENERATION␣
↪PROCESS=======================

Starting with file:
TestModel
IDD location is: C:\EnergyPlusV23-1-0\Energy+.idd
The occupied zones in the model TestModel are:
BLOCK1:ZONE2
BLOCK1:ZONE1
The windows and doors in the model TestModel are:
Block1_Zone2_Wall_3_0_0_0_0_0_Win
.
.
.
Added - BLOCK1_ZONE1 VRF Indoor Unit DX Cooling Coil Reporting Frequency Runperiod␣
↪Output:Variable data
Added - BLOCK1_ZONE1 VRF Indoor Unit DX Heating Coil Reporting Frequency Runperiod␣
↪Output:Variable data
IDF has been saved
Ending with file:
TestModel
=======================END OF GENERIC IDF FILE GENERATION PROCESS=======================

The following IDFs will not work, and therefore these will be deleted:
None
```

And then ask us to enter the required information to generate the output IDF files (you can omit some by hitting enter without entering any value):

```
=======================START OF OUTPUT IDF FILES GENERATION␣
↪PROCESS=======================

The information you will be required to enter below will be used to generate the␣
↪customised output IDFs:
Enter the Comfort Standard numbers separated by space (
0 = ESP CTE;
1 = INT EN16798-1;
2 = INT ASHRAE55;
3 = JPN Rijal;
4 = CHN GBT50785 Cold;
5 = CHN GBT50785 HotMild;
6 = CHN Yang;
7 = IND IMAC C NV;
8 = IND IMAC C MM;
9 = IND IMAC R 7DRM;
10 = IND IMAC R 30DRM;
11 = IND Dhaka;
```

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```
12 = ROM Udrea;
13 = AUS Williamson;
14 = AUS DeDear;
15 = BRA Rupp NV;
16 = BRA Rupp AC;
17 = MEX Oropeza Arid;
18 = MEX Oropeza DryTropic;
19 = MEX Oropeza Temperate;
20 = MEX Oropeza HumTropic;
21 = CHL Perez-Fargallo;
22 = INT ISO7730;
Please refer to the full list of setpoint temperatures at https://htmlpreview.github.io/?
↪https://github.com/dsanchez-garcia/accim/blob/master/accim/docs/html_files/full_
↪setpoint_table.html
): 1 2 7
          Are you sure the numbers are correct? [y or [] / n]:

For the comfort standard 1 = INT EN16798, the available categories you can choose are:
1 = EN16798 Category I
2 = EN16798 Category II
3 = EN16798 Category III
For the comfort standard 2 = INT ASHRAE55, the available categories you can choose are:
80 = ASHRAE 55 80% acceptability
90 = ASHRAE 55 90% acceptability
For the comfort standard 7 = IND IMAC C NV, the available categories you can choose are:
80 = 80% acceptability
85 = 85% acceptability
90 = 90% acceptability
Enter the Category numbers separated by space (
1 = CAT I / CAT A;
2 = CAT II / CAT B;
3 = CAT III / CAT C;
80 = 80% ACCEPT;
85 = 85% ACCEPT;
90 = 90% ACCEPT;
Please refer to the full list of setpoint temperatures at https://htmlpreview.github.io/?
↪https://github.com/dsanchez-garcia/accim/blob/master/accim/docs/html_files/full_
↪setpoint_table.html
): 2 3 85 90
          Are you sure the numbers are correct? [y or [] / n]:

For the comfort standard 1 = INT EN16798, the available ComfMods you can choose are:
0 = EN16798 Static setpoints
1 = EN16798 Adaptive setpoints when applicable, otherwise CTE
2 = EN16798 Adaptive setpoints when applicable, otherwise EN16798 Static setpoints
3 = EN16798 Adaptive setpoints when applicable, otherwise EN16798 Adaptive setpoints␣
↪horizontally extended
For the comfort standard 2 = INT ASHRAE55, the available ComfMods you can choose are:
0 = ISO 7730 Static setpoints
1 = ASHRAE 55 Adaptive setpoints when applicable, otherwise CTE
2 = ASHRAE 55 Adaptive setpoints when applicable, otherwise ISO 7730 Static setpoints
3 = ASHRAE 55 Adaptive setpoints when applicable, otherwise ASHRAE 55 Adaptive setpoints␣
```

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```
↪horizontally extended
For the comfort standard 7 = IND IMAC C NV, the available ComfMods you can choose are:
0 = Indian Building Code Static setpoints
1 = IMAC C NV Model Adaptive setpoints when applicable, otherwise Indian Building Code␣
↪Static setpoints
2 = IMAC C NV Model Adaptive setpoints when applicable, otherwise ISO 7730 Static␣
↪setpoints
3 = IMAC C NV Model Adaptive setpoints when applicable, otherwise Adaptive setpoints␣
↪horizontally extended
Enter the Comfort Mode numbers separated by space (
0 or 0.X = Static;
1, 1.X, 2, 3 = Adaptive;
Please refer to the full list of setpoint temperatures at https://htmlpreview.github.io/?
↪https://github.com/dsanchez-garcia/accim/blob/master/accim/docs/html_files/full_
↪setpoint_table.html
): 0 3
          Are you sure the numbers are correct? [y or [] / n]:

Enter the setpoint accuracy number (any number greater than 0): 100
          Are you sure the number is correct? [y or [] / n]:

Enter the start of the cooling season in numeric date format dd/mm or the day of the␣
↪year: 01/05
          Are you sure the number is correct? [y or [] / n]:

Enter the end of the cooling season in numeric date format dd/mm or the day of the year:␣
↪01/10
          Are you sure the number is correct? [y or [] / n]:

Enter the HVAC Mode numbers separated by space (
0 = Fully Air-conditioned;
1 = Naturally ventilated;
2 = Mixed Mode;
): 2
          Are you sure the numbers are correct? [y or [] / n]:

Enter the Ventilation Control numbers separated by space (
If HVACmode = 1:
   0 = Ventilates above neutral temperature;
   1 = Ventilates above upper comfort limit;
If HVACmode = 2:
   0 = Ventilates above neutral temperature and fully opens doors and windows;
   1 = Ventilates above lower comfort limit and fully opens doors and windows;
   2 = Ventilates above neutral temperature and opens doors and windows based on the␣
↪customised venting opening factor;
   3 = Ventilates above lower comfort limit and opens doors and windows based on the␣
↪customised venting opening factor;
): 2 3
          Are you sure the numbers are correct? [y or [] / n]:
Enter the maximum temperature difference number for Ventilation Opening Factor (any␣
↪number larger than 0): 15
          Are you sure the number is correct? [y or [] / n]:
```

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```
Enter the minimum temperature difference number for Ventilation Opening Factor (any␣
↪number larger than 0 and smaller than the maximum temperature difference number): 1
          Are you sure the number is correct? [y or [] / n]:
Enter the multiplier number for Ventilation Opening Factor (any number between 0 and 1):␣
↪0.2
          Are you sure the number is correct? [y or [] / n]:

Enter the VSToffset numbers separated by space (if omitted, will be 0):
          Are you sure the numbers are correct? [y or [] / n]:

Enter the MinOToffset numbers separated by space (if omitted, will be 50):
          Are you sure the numbers are correct? [y or [] / n]:

Enter the MaxWindSpeed numbers separated by space (if omitted, will be 50):
          Are you sure the numbers are correct? [y or [] / n]:

Enter the ASTtol value from (if omitted, will be 0.1):
          Are you sure the numbers are correct? [y or [] / n]:
Enter the ASTtol value to (if omitted, will be 0.1):
          Are you sure the numbers are correct? [y or [] / n]:
Enter the ASTtol value steps (if omitted, will be 0.1):
          Are you sure the numbers are correct? [y or [] / n]:
```

Afterwards, ACCIS will let us know which the output IDFs are going to be, the total number of them and will ask for our confirmation to proceed:

```
The list of output IDFs is going to be:
TestModel[CS_INT EN16798[CA_2[CM_0.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_0.0[HM_2[VC_3[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_3.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_3.0[HM_2[VC_3[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_0.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_0.0[HM_2[VC_3[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_3.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_3.0[HM_2[VC_3[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT ASHRAE55[CA_90[CM_0.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT ASHRAE55[CA_90[CM_0.0[HM_2[VC_3[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT ASHRAE55[CA_90[CM_3.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT ASHRAE55[CA_90[CM_3.0[HM_2[VC_3[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_IND IMAC C NV[CA_85[CM_0.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_IND IMAC C NV[CA_85[CM_0.0[HM_2[VC_3[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_IND IMAC C NV[CA_85[CM_3.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_IND IMAC C NV[CA_85[CM_3.0[HM_2[VC_3[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_IND IMAC C NV[CA_90[CM_0.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_IND IMAC C NV[CA_90[CM_0.0[HM_2[VC_3[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_IND IMAC C NV[CA_90[CM_3.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_IND IMAC C NV[CA_90[CM_3.0[HM_2[VC_3[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
And the total number of output IDFs is going to be 20
Do you still want to run ACCIS? [y/n]: y
```

If we entered n, the whole process would shut down. Otherwise, if we entered 'y', the generation of output IDF files would start, and ACCIS would print on screen each output IDF name as it generates it. As you can see, we are going to use the EN16798-1, ASHRAE 55 and IMAC Commercial for naturally ventilated buildings, categories

2 and 3 for EN16798, 90% acceptability levels for ASHRAE 55, 85 and 90% acceptability levels for IMAC C NV, all with ComfMod 0 (with static setpoint temperatures) and 3 (with adaptive setpoint temperatures when the model is applicable, otherwise horizontally extending the adaptive setpoint temperatures), Mixed Mode, and we just went ahead with the remaining default values.

```
Generating the following output IDF files:
TestModel[CS_INT EN16798[CA_2[CM_0.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_0.0[HM_2[VC_3[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_3.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_3.0[HM_2[VC_3[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_0.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_0.0[HM_2[VC_3[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_3.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_3.0[HM_2[VC_3[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT ASHRAE55[CA_90[CM_0.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT ASHRAE55[CA_90[CM_0.0[HM_2[VC_3[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT ASHRAE55[CA_90[CM_3.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT ASHRAE55[CA_90[CM_3.0[HM_2[VC_3[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_IND IMAC C NV[CA_85[CM_0.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_IND IMAC C NV[CA_85[CM_0.0[HM_2[VC_3[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_IND IMAC C NV[CA_85[CM_3.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_IND IMAC C NV[CA_85[CM_3.0[HM_2[VC_3[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_IND IMAC C NV[CA_90[CM_0.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_IND IMAC C NV[CA_90[CM_0.0[HM_2[VC_3[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_IND IMAC C NV[CA_90[CM_3.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_IND IMAC C NV[CA_90[CM_3.0[HM_2[VC_3[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf

=======================END OF OUTPUT IDF FILES GENERATION PROCESS=======================
```

Afterwards, you just need to run the simulation. Once you have run the simulations you need, you'll get the files you usually get when you run any simulation, including the hourly results on a CSV file.

4.5 4.5 Renaming epw files for later data analysis

You can see a Jupyter Notebook either in the How-to Guide section of this documentation or in the link below:

https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_notebooks/rename_epw_files/using_rename_epw_files.ipynb

You can also execute it at your computer. You just need to find the folder containing the .ipynb and all other files at the accim package folder within your site_packages path, in

accim/sample_files/jupyter_notebooks/rename_epw_files

The path should be something like this, with your username instead of YOUR_USERNAME:

C:\Users\YOUR_USERNAME\AppData\Local\Programs\Python\Python39\Lib\site-packages\accim\sample_files\jupyter_notebooks\ren

Then, you just need to copy the folder to a different path (i.e. Desktop), open a cmd dialog pointing at it, and run "jupyter notebook". After that, an internet browser will pop up, and you will be able to open the .ipynb file.

4.6 4.6 Running simulations

You can see a Jupyter Notebook either in the How-to Guide section of this documentation or in the link below:

https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_notebooks/runEp/using_runEp.ipynb

You can also execute it at your computer. You just need to find the folder containing the .ipynb and all other files at the accim package folder within your site_packages path, in

accim/sample_files/jupyter_notebooks/runEp

The path should be something like this, with your username instead of YOUR_USERNAME:

C:\Users\YOUR_USERNAME\AppData\Local\Programs\Python\Python39\Lib\site-packages\accim\sample_files\jupyter_notebooks\run

Then, you just need to copy the folder to a different path (i.e. Desktop), open a cmd dialog pointing at it, and run "jupyter notebook". After that, an internet browser will pop up, and you will be able to open the .ipynb file.

This script has been created by eppy's development team (https://eppy.readthedocs.io/en/latest/runningeplus.html, specifically from section 'Running in parallel processes using Generators'), however I did some changes. Anyway, you probably should check out eppy package, since it's absolutely awesome.

By using this script, the EnergyPlus version used to simulate the IDFs will be the IDF's version. Therefore, if your IDF is in version 9.4, but you don't have EnergyPlus 9.4 installed, you'll get an error.

The main difference is that this one allows to run simulations with several EPW files. It takes all EPW files and IDF files located in the script folder, and runs them. So for example, say you have 2 no. IDFs (1.idf and 2.idf) and 2 no. EPW files (a.epw and b.epw). Then, this script will run the following simulations: 1[a; 1[b; 2[a; 2[b. The character '[' has been used as separator in order to not to be in conflict with other programs. Besides, there's a package within accim currently being developed (within folder data) in order to generate tables and graphs automatically.

So, how to use it?

Say you have already run any of the accis functions, and therefore you might have a folder with the following files:

```
Mode                 LastWriteTime         Length Name
----                 -------------         ------ ----
-a---l        20/07/2019     12:42        1407718 Bilbao_2015.epw
-a---l        20/07/2019     12:43        1408160 Bilbao_2016.epw
-a----        27/02/2021     15:01         114617 TestModel_SingleZone.idf
-a---l        27/02/2021     15:01         114617 TestModel_SingleZone_pymod[AS_
↪EN16798[CA_1[CM_3[AT_0.1.idf
-a---l        27/02/2021     15:01         114617 TestModel_SingleZone_pymod[AS_
↪EN16798[CA_2[CM_3[AT_0.1.idf
```

So, now we can run the simulations:

```
>>> from accim.run import run
>>> dir(run)
['IDF', '__builtins__', '__cached__', '__doc__', '__file__', '__loader__', '__name__', '_
↪_package__', '__spec__', 'make_eplaunch_options', 'os', 'removefiles', 'runEp',
↪'runIDFs']
>>> run.runEp()
```

`runEp()` is going to ask you if you want to run the simulations only with IDF files generated by accim. If you enter 'y', it'll run only accim output IDFs, otherwise if you enter 'n', it will run all idfs in the folder. As you can see below, we didn't need to remove the original IDF 'TestModel_SingleZone.idf' from the folder. Then, it will let you know the IDFs and EPWs that are going to be used in the simulations. Besides, it'll let you know the total number of simulations,

and will ask for your confirmation, because you might start thousands of simulations by mistake. Further, `runEp()`can take a total number of 3 arguments, which are 2 boolean arguments, and one integer: `runEp(runOnlyAccim=True, confirmRun=True, num_CPUs=4)`. If you entered these, you would skip the command prompt process and jump straight to the simulation process. Since we entered 4 for the num_CPUs argument, the simulations would be run by using 4 CPS at the same time.

```
>>> run.runEp()
Do you want to run only accim output IDFs? [y or n]:y
The IDFs we are going to run are: ['TestModel_SingleZone_pymod[AS_EN16798[CA_1[CM_3[AT_0.
↪1.idf', 'TestModel_SingleZone_pymod[AS_EN16798[CA_2[CM_3[AT_0.1.idf']
 and the No. of IDFs is going to be 2
The EPWs we are going to run are: ['Bilbao_2015.epw', 'Bilbao_2016.epw']
 and the No. of EPWs is going to be 2
Therefore, the simulations are going to be:
TestModel_SingleZone_pymod[AS_EN16798[CA_1[CM_3[AT_0.1.idf[Bilbao_2015.epw
TestModel_SingleZone_pymod[AS_EN16798[CA_1[CM_3[AT_0.1.idf[Bilbao_2016.epw
TestModel_SingleZone_pymod[AS_EN16798[CA_2[CM_3[AT_0.1.idf[Bilbao_2015.epw
TestModel_SingleZone_pymod[AS_EN16798[CA_2[CM_3[AT_0.1.idf[Bilbao_2016.epw
 and the No. of simulations is going to be 4
The number of simulations is going to be 4. Do you still want to proceed?[y or n]:y
```

Afterwards, you'll see the calculations progress if you use the windows prompt command, and you'll get an extensive list of simulation files, similar to this:

```
Mode                 LastWriteTime         Length Name
----                 -------------         ------ ----
-a---l        20/07/2019     12:42        1407718 Bilbao_2015.epw
-a---l        20/07/2019     12:43        1408160 Bilbao_2016.epw
-a---l        27/02/2021     15:01         114617 TestModel_SingleZone_pymod[AS_
↪EN16798[CA_1[CM_3[AT_0.1.idf
-a---l        27/02/2021     16:47           1721 TestModel_SingleZone_pymod[AS_
↪EN16798[CA_1[CM_3[AT_0[Bilbao_2015.audit
-a---l        27/02/2021     16:47           9179 TestModel_SingleZone_pymod[AS_
↪EN16798[CA_1[CM_3[AT_0[Bilbao_2015.bnd
-a---l        27/02/2021     16:47        2023160 TestModel_SingleZone_pymod[AS_
↪EN16798[CA_1[CM_3[AT_0[Bilbao_2015.csv
-a---l        27/02/2021     16:47           6181 TestModel_SingleZone_pymod[AS_
↪EN16798[CA_1[CM_3[AT_0[Bilbao_2015.dxf
-a---l        27/02/2021     16:47          30483 TestModel_SingleZone_pymod[AS_
↪EN16798[CA_1[CM_3[AT_0[Bilbao_2015.eio
-a---l        27/02/2021     16:47             99 TestModel_SingleZone_pymod[AS_
↪EN16798[CA_1[CM_3[AT_0[Bilbao_2015.end
-a---l        27/02/2021     16:47           5351 TestModel_SingleZone_pymod[AS_
↪EN16798[CA_1[CM_3[AT_0[Bilbao_2015.err
-a---l        27/02/2021     16:47        2968770 TestModel_SingleZone_pymod[AS_
↪EN16798[CA_1[CM_3[AT_0[Bilbao_2015.eso
-a---l        27/02/2021     16:47              0 TestModel_SingleZone_pymod[AS_
↪EN16798[CA_1[CM_3[AT_0[Bilbao_2015.mdd
-a---l        27/02/2021     16:47          13352 TestModel_SingleZone_pymod[AS_
↪EN16798[CA_1[CM_3[AT_0[Bilbao_2015.mtd
-a---l        27/02/2021     16:47              0 TestModel_SingleZone_pymod[AS_
↪EN16798[CA_1[CM_3[AT_0[Bilbao_2015.rdd
-a---l        27/02/2021     16:47           1107 TestModel_SingleZone_pymod[AS_
↪EN16798[CA_1[CM_3[AT_0[Bilbao_2015.rvaudit
```

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```
-a---l        27/02/2021     16:47           2667 TestModel_SingleZone_pymod[AS_
↪EN16798[CA_1[CM_3[AT_0[Bilbao_2015.shd
-a---l        27/02/2021     16:47          34187 TestModel_SingleZone_pymod[AS_
↪EN16798[CA_1[CM_3[AT_0[Bilbao_2015Table.csv
-a---l        27/02/2021     16:47         139585 TestModel_SingleZone_pymod[AS_
↪EN16798[CA_1[CM_3[AT_0[Bilbao_2015Table.htm
-a---l        27/02/2021     16:47           3421 TestModel_SingleZone_pymod[AS_
↪EN16798[CA_1[CM_3[AT_0[Bilbao_2015Zsz.csv
.
.
.
```

You might need to keep these in order to debug some error, or any other reason, but if you don't need to keep these except csv values with hourly results, you can run the `removefiles()` function:

```
>>> run.removefiles()
```

And now your working directory should look like this:

```
Mode                 LastWriteTime         Length Name
----                 -------------         ------ ----
-a---l        20/07/2019     12:42        1407718 Bilbao_2015.epw
-a---l        20/07/2019     12:43        1408160 Bilbao_2016.epw
-a---l        27/02/2021     15:01         114617 TestModel_SingleZone_pymod[AS_
↪EN16798[CA_1[CM_3[AT_0.1.idf
-a---l        27/02/2021     16:47        2023160 TestModel_SingleZone_pymod[AS_
↪EN16798[CA_1[CM_3[AT_0[Bilbao_2015.csv
-a---l        27/02/2021     16:47        2017212 TestModel_SingleZone_pymod[AS_
↪EN16798[CA_1[CM_3[AT_0[Bilbao_2016.csv
-a---l        27/02/2021     15:01         114617 TestModel_SingleZone_pymod[AS_
↪EN16798[CA_2[CM_3[AT_0.1.idf
-a---l        27/02/2021     16:47        2023114 TestModel_SingleZone_pymod[AS_
↪EN16798[CA_2[CM_3[AT_0[Bilbao_2015.csv
-a---l        27/02/2021     16:47        2017070 TestModel_SingleZone_pymod[AS_
↪EN16798[CA_2[CM_3[AT_0[Bilbao_2016.csv
```

As you can see, `removefiles()` removes everything except EPW files, IDFs, .py scripts and the hourly CSV values which contains the results of the simulations.

4.7 4.7 Functions and methods for data analysis; making figures and tables

You can see a Jupyter Notebook either in the How-to Guide section of this documentation or in the link below:

https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_notebooks/Table/using_Table.ipynb

You can also execute it at your computer. You just need to find the folder containing the .ipynb and all other files at the accim package folder within your site_packages path, in

accim/sample_files/jupyter_notebooks/Table

The path should be something like this, with your username instead of YOUR_USERNAME:

C:\Users\YOUR_USERNAME\AppData\Local\Programs\Python\Python39\Lib\site-packages\accim\sample_files\jupyter_notebooks\Tal

Then, you just need to copy the folder to a different path (i.e. Desktop), open a cmd dialog pointing at it, and run "jupyter notebook". After that, an internet browser will pop up, and you will be able to open the .ipynb file.

CHAPTER

FIVE

5. TROUBLESHOOTING

5.1 5.1 Errors you might get

Below you can see a few errors you might get when trying to run `addAccis()`:

```
ModuleNotFoundError: No module named 'numpy'
```

You need to update the numpy package. To do so, you just need to open cmd and enter:

```
pip install numpy --upgrade
```

```
UnicodeEncodeError: 'latin-1' codec can't encode character '\u0144' in position 123174:
ordinal not in range(256)
```

This error means that there are some unconventional characters within the model. To amend this problem, try the following:

- Open the IDF with a text editor and Check there are no accents or other unconventional characters such as 'ñ'. For example, you can try replacing all instances of 'á' with 'a'.
- If it doesn't work and you are using Designbuilder to model the building, then you can try opening a new file, then importing the building geometry to the new file, exporting only libraries used from the old model (it is recommended to carefully check that all inherent data, from schedules to profiles, constructions and materials within these libraries are in English), and finally importing these to the new model and assigning them to the relevant objects as needed.

```
this node -WINDOWPROPERTY:SHADINGCONTROL-is not present in base dictionary
this node -WINDOWPROPERTY:SHADINGCONTROL-is not present in base dictionary
1 <class 'int'> None <class 'NoneType'>
Traceback (most recent call last):
  File "<stdin>", line 1, in <module>
  File "C:\Users\sanga\AppData\Local\Programs\Python\Python39\lib\site-packages
\accim\sim\accis.py", line 138, in addAccis
    z = accim_Main.accimJob(filename_temp=file, ScriptType=ScriptType, EnergyPl
us_version=EnergyPlus_version, verboseMode=verboseMode)
  File "C:\Users\sanga\AppData\Local\Programs\Python\Python39\lib\site-packages
\accim\sim\accim_Main.py", line 66, in __init__
    self.idf0 = IDF(fname1)
  File "C:\Users\sanga\AppData\Local\Programs\Python\Python39\lib\site-packages
```

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```
\eppy\modeleditor.py", line 548, in __init__
    self.read()
  File "C:\Users\sanga\AppData\Local\Programs\Python\Python39\lib\site-packages
\eppy\modeleditor.py", line 672, in read
    readout = idfreader1(
  File "C:\Users\sanga\AppData\Local\Programs\Python\Python39\lib\site-packages
\eppy\idfreader.py", line 307, in idfreader1
    bunchdt = makebunches_alter(data, commdct, theidf, block)
  File "C:\Users\sanga\AppData\Local\Programs\Python\Python39\lib\site-packages
\eppy\idfreader.py", line 109, in makebunches_alter
    bobj = makeabunch(commdct, obj, obj_i, block=block)
  File "C:\Users\sanga\AppData\Local\Programs\Python\Python39\lib\site-packages
\eppy\idfreader.py", line 68, in makeabunch
    extlst = extension_of_extensible(commdct[obj_i], block[obj_i], n)
  File "C:\Users\sanga\AppData\Local\Programs\Python\Python39\lib\site-packages
\eppy\idfreader.py", line 332, in extension_of_extensible
    n = n // ext
TypeError: unsupported operand type(s) for //: 'int' and 'NoneType'
```

If you get an error similar to the one above, you are probably trying to run `addAccis()` with an IDF whose EnergyPlus version is 8.9 or older. To solve this problem, you need to update the IDF's EnergyPlus version up to some 9.X.X version. It is recommended to update up to the latest. To do so, you need to run EP-Launch, go to the Utilities tab, look for and select IDFversionUpdater; run IDFVersionUpdater; then choose the file to update, select the new version and finally update file.

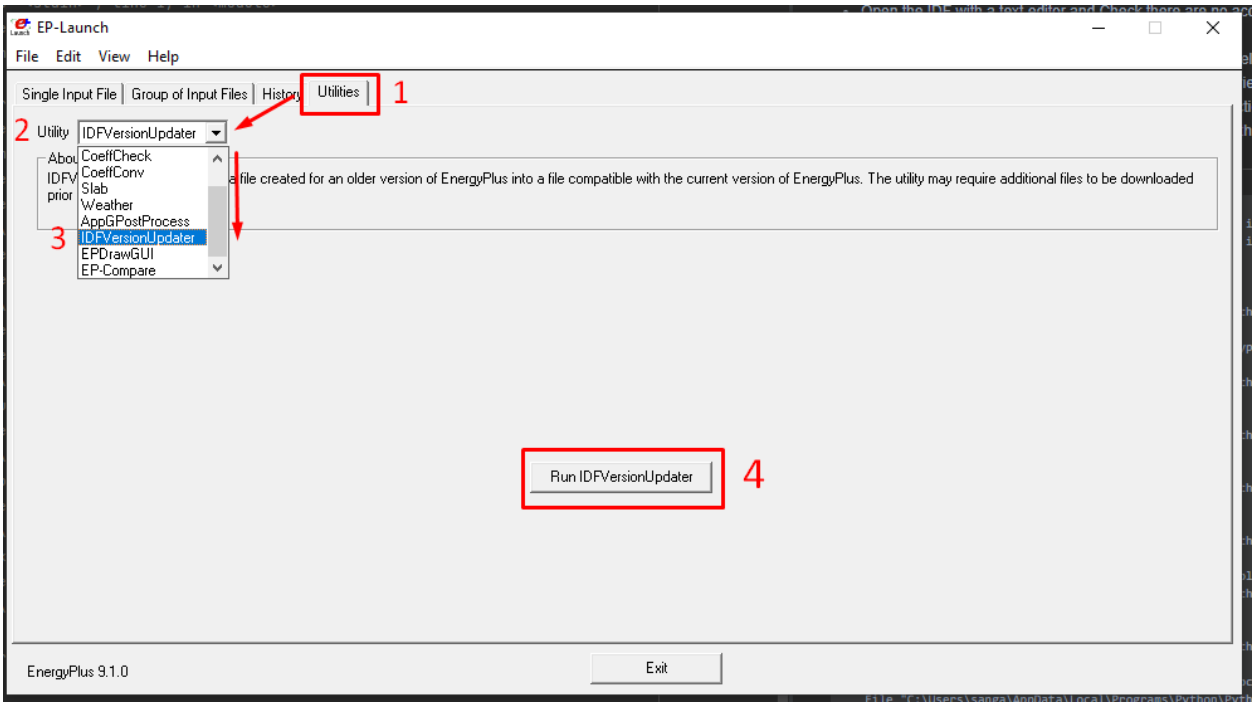

Fig. 1: Troubleshooting_IDFversion_01

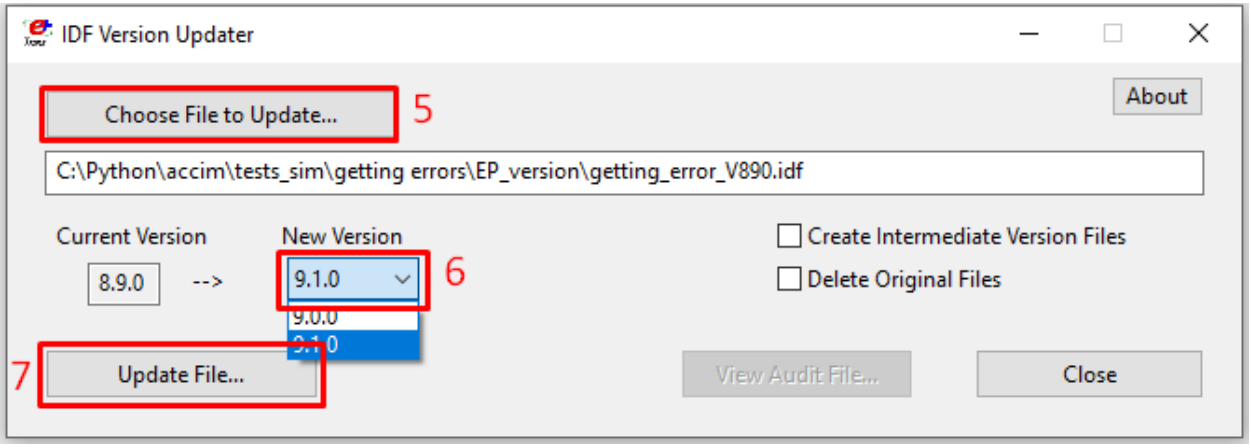

Fig. 2: Troubleshooting_IDFversion_02

5.2 6.2 General recommendations

If you are using only one version of Python in your computer, you should check on the option 'Add to PATH'. Otherwise, the python interpreter won't be able to find the accis package.

Also, once you have installed Python 3.9, you should also diable the path length limit:

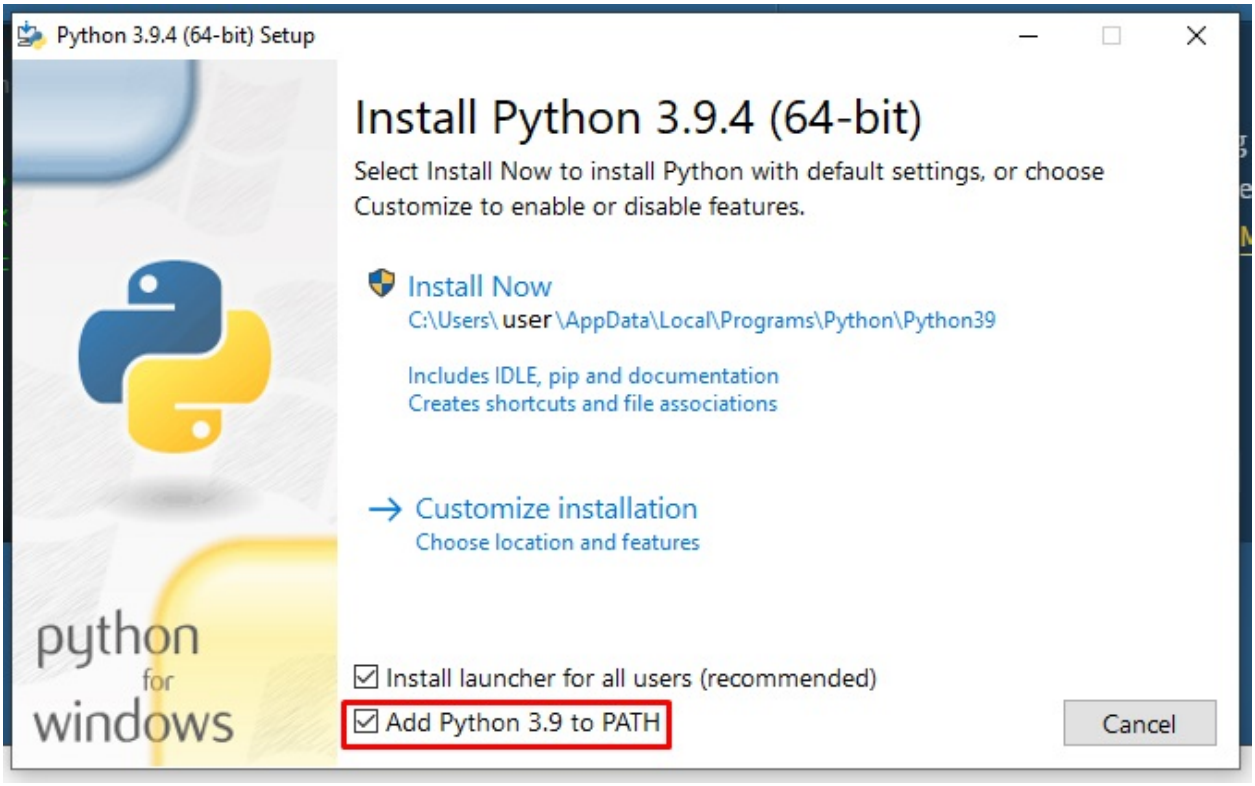

Fig. 3: Troubleshooting_Path

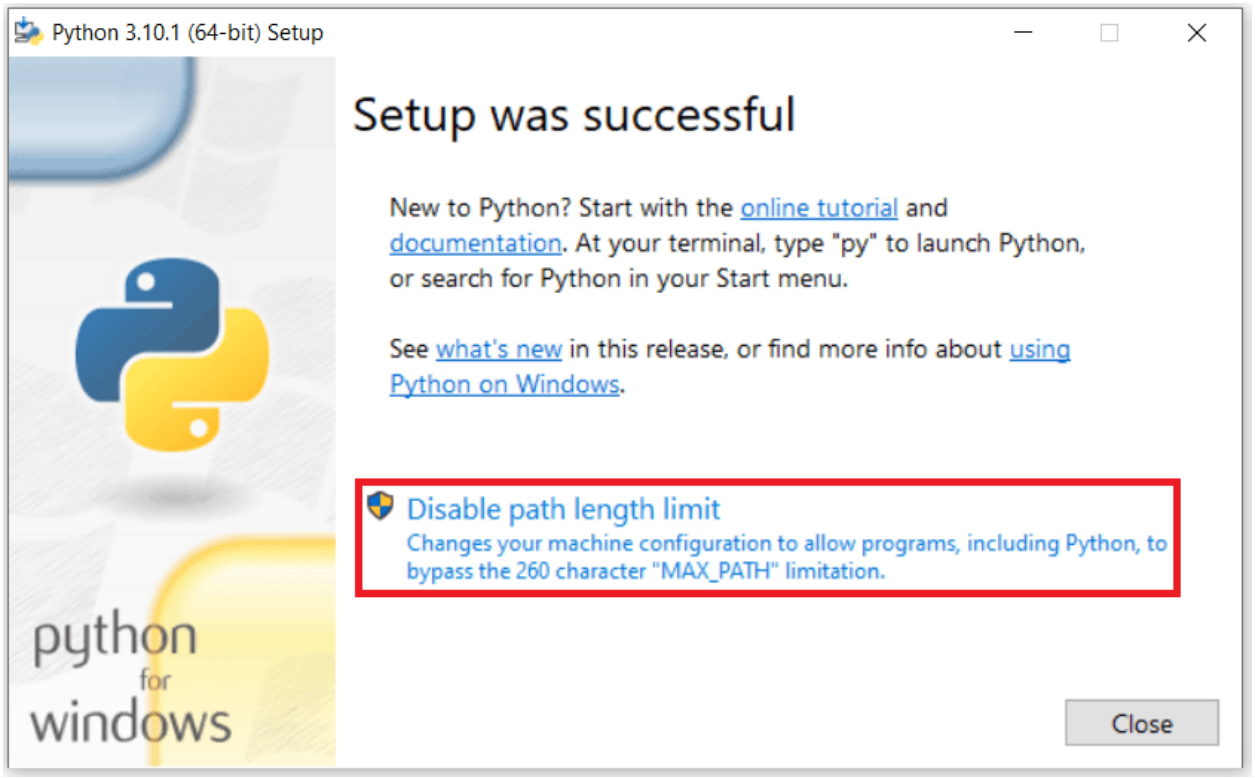

Fig. 4: Troubleshooting_Disable_length_limit

CHAPTER

SIX

6. CITATION

If you use this package, please cite us:

Sánchez-García, D., Bienvenido-Huertas, D., Rubio-Bellido, C., 2021. *Computational approach to extend the air-conditioning usage to adaptive comfort: Adaptive-Comfort-Control-Implementation Script.* Automation in Construction. 131, 103900. https://doi.org/10.1016/j.autcon.2021.103900

Sánchez-García, D., Martínez-Crespo, J., Hernando, U.R.R., Alonso, C., 2023. *A detailed view of the Adaptive-Comfort-Control-Implementation Script (ACCIS): The capabilities of the automation system for adaptive setpoint temperatures in building energy models.* Energy and Buildings. 288. https://doi.org/10.1016/j.enbuild.2023.113019

CHAPTER

SEVEN

7. CREDITS

It wouldn't have been possible to develop this python package without eppy, so thank you for such an awesome work.

CHAPTER

EIGHT

USING `addAccis()` TO APPLY ADAPTIVE SETPOINT TEMPERATURES

We are going to apply the adaptive setpoint temperatures to the idf "TestModel_onlyGeometryForVRFsystem_2zones_CalcVent_V2310", that can be found in the path `accim/sample_files/sample IDFs/input_IDFs`. However, for clarity purposes, has been renamed to "TestModel.idf".

First of all, let's see what files we do have in the folder:

[1]:
```
import os
os.listdir()
```

[1]:
```
['.ipynb_checkpoints', 'TestModel.idf', 'using_addAccis.ipynb', '__init__.py']
```

You can see there is/are a/some IDF file/files there, which is/are:

[2]:
```
input_idf = [i for i in os.listdir() if i.endswith('.idf')]
print(*input_idf, sep='\n')
```

```
TestModel.idf
```

So, let's apply adaptive setpoint temperatures.

8.1 1. General use

8.1.1 1.1 Short version

First, let's do this using the short version. When we run the code below (not entering any argument), accim will request some information to generate the output idfs. We are going to enter the following information in **bold**:

Enter the ScriptType (for VRFsystem with full air-conditioning mode: vrf_ac; for VRFsystem with mixed-mode: vrf_mm; for ExistingHVAC with mixed mode: ex_mm; for ExistingHVAC with full air-conditioning mode: ex_ac): **vrf_mm**

Enter the SupplyAirTempInputMethod (for Supply Air Temperature: supply air temperature; for Temperature Difference: temperature difference;): **temperature difference**

Do you want to keep the existing outputs (true or false)?: **false**

Enter the Output type (standard, simplified or detailed): **standard**

Enter the Output frequencies separated by space (timestep, hourly, daily, monthly, runperiod): **hourly runperiod**

Enter the EnergyPlus version (9.1 to 23.1): **23.1**

Enter the Temperature Control method (temperature or pmv): **temperature**

Then, accim will report the information we just entered, and will start generating a generic idf file, which will be modified based on the remaining arguments accim will request in a second stage. Again, we are going to enter the following information in **bold**:

Enter the Comfort Standard numbers separated by space (...): **1 14**

Are you sure the numbers are correct? [y or [] / n]: **(just hit enter)**

Enter the Category numbers separated by space (...): **1 2 3 80 90**

Are you sure the numbers are correct? [y or [] / n]: **(just hit enter)**

Enter the Comfort Mode numbers separated by space (...): **0 0.1 0.2 0.3 0.4 0.5 1 1.1 1.2 1.3 1.4 1.5 2 3**

Are you sure the numbers are correct? [y or [] / n]: **(just hit enter)**

Enter the setpoint accuracy number (any number greater than 0): **100**

Are you sure the number is correct? [y or [] / n]: **(just hit enter)**

Enter the start of the cooling season in numeric date format dd/mm or the day of the year: **01/11**

Are you sure the number is correct? [y or [] / n]: **(just hit enter)**

Enter the end of the cooling season in numeric date format dd/mm or the day of the year: **01/03**

Are you sure the number is correct? [y or [] / n]: **(just hit enter)**

Enter the HVAC Mode numbers separated by space (...): **2**

Are you sure the numbers are correct? [y or [] / n]: **(just hit enter)**

Enter the Ventilation Control numbers separated by space (...): **2**

Are you sure the numbers are correct? [y or [] / n]: **(just hit enter)**

Enter the maximum temperature difference number for Ventilation Opening Factor (any number larger than 0): **20**

Are you sure the number is correct? [y or [] / n]: **(just hit enter)**

Enter the minimum temperature difference number for Ventilation Opening Factor (any number larger than 0 and smaller than the maximum temperature difference number): **1**

Are you sure the number is correct? [y or [] / n]: **(just hit enter)**

Enter the multiplier number for Ventilation Opening Factor (any number between 0 and 1): **0.2**

Are you sure the number is correct? [y or [] / n]: **(just hit enter)**

Enter the VSToffset numbers separated by space (if omitted, will be 0): **(just hit enter)**

Are you sure the numbers are correct? [y or [] / n]: **(just hit enter)**

Enter the MinOToffset numbers separated by space (if omitted, will be 50): **(just hit enter)**

Are you sure the numbers are correct? [y or [] / n]: **(just hit enter)**

Enter the MaxWindSpeed numbers separated by space (if omitted, will be 50): **(just hit enter)**

Are you sure the numbers are correct? [y or [] / n]: **(just hit enter)**

Enter the ASTtol value from (if omitted, will be 0.1): **(just hit enter)**

Are you sure the numbers are correct? [y or [] / n]: **(just hit enter)**

Enter the ASTtol value to (if omitted, will be 0.1): **(just hit enter)**

Are you sure the numbers are correct? [y or [] / n]: **(just hit enter)**

Enter the ASTtol value steps (if omitted, will be 0.1): **(just hit enter)**

Are you sure the numbers are correct? [y or [] / n]: **(just hit enter)**

[3]:
```
from accim.sim import accis
accis.addAccis()
```

```
------------------------------------------------------------
Adaptive-Comfort-Control-Implemented Model (ACCIM) v0.7.0
------------------------------------------------------------

This tool allows to apply adaptive setpoint temperatures.
For further information, please read the documentation:
https://accim.readthedocs.io/en/master/
For a visual understanding of the tool, please visit the following jupyter notebooks:
-    Using addAccis() to apply adaptive setpoint temperatures
https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_
↪notebooks/addAccis/using_addAccis.ipynb
-    Using rename_epw_files() to rename the EPWs for proper data analysis after␣
↪simulation
https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_
↪notebooks/rename_epw_files/using_rename_epw_files.ipynb
-    Using runEp() to directly run simulations with EnergyPlus
https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_
↪notebooks/runEp/using_runEp.ipynb
-    Using the class Table() for data analysis
https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_
↪notebooks/Table/using_Table.ipynb
-    Full example
https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_
↪notebooks/Table/using_Table.ipynb

Starting with the process.

Now, you are going to be asked to enter some information for different arguments to␣
↪generate the output IDFs with adaptive setpoint temperatures.
If you are not sure about how to use these parameters, please take a look at the␣
↪documentation in the following link:
https://accim.readthedocs.io/en/master/4_detailed%20use.html

Please, enter the following information:

Enter the ScriptType (
for VRFsystem with full air-conditioning mode: vrf_ac;
for VRFsystem with mixed-mode: vrf_mm;
for ExistingHVAC with mixed mode: ex_mm;
for ExistingHVAC with full air-conditioning mode: ex_ac
): vrf_mm

Enter the SupplyAirTempInputMethod (
for Supply Air Temperature: supply air temperature;
for Temperature Difference: temperature difference;
): temperature difference

Do you want to keep the existing outputs (true or false)?: false
```

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```
Enter the Output type (standard, simplified, detailed or custom): standard

Enter the Output frequencies separated by space (timestep, hourly, daily, monthly,␣
↪runperiod): hourly runperiod

Do you want to generate a dataframe to see all outputs? (true or false): false

Enter the EnergyPlus version (9.1 to 23.1): 23.1

Enter the Temperature Control method (temperature or pmv): temperature
Basic input data:
ScriptType is: vrf_mm
Supply Air Temperature Input Method is: temperature difference
Output type is: standard
Output frequencies are:
['hourly', 'runperiod']
EnergyPlus version is: 23.1
Temperature Control method is: temperature

======================START OF GENERIC IDF FILE GENERATION␣
↪PROCESS======================

Starting with file:
TestModel
IDD location is: C:\EnergyPlusV23-1-0\Energy+.idd
The occupied zones in the model TestModel are:
BLOCK1:ZONE2
BLOCK1:ZONE1
The windows and doors in the model TestModel are:
Block1_Zone2_Wall_3_0_0_0_0_0_Win
Block1_Zone2_Wall_4_0_0_0_0_0_Win
Block1_Zone2_Wall_5_0_0_0_0_0_Win
Block1_Zone1_Wall_2_0_0_0_0_0_Win
Block1_Zone1_Wall_3_0_0_0_0_0_Win
Block1_Zone1_Wall_5_0_0_0_0_0_Win
The zones in the model TestModel are:
BLOCK1_ZONE2
BLOCK1_ZONE1
The people objects in the model have been amended.
BLOCK1:ZONE2 Thermostat has been added
BLOCK1:ZONE1 Thermostat has been added
On Schedule already was in the model
TypOperativeTempControlSch Schedule already was in the model
All ZoneHVAC:IdealLoadsAirSystem Heating and Cooling availability schedules has been set␣
↪to on
On 24/7 Schedule already was in the model
Control type schedule: Always 4 Schedule has been added
Relative humidity setpoint schedule: Always 50.00 Schedule has been added
Heating Fanger comfort setpoint: Always -0.5 Schedule has been added
Cooling Fanger comfort setpoint: Always  0.1 Schedule has been added
Zone CO2 setpoint: Always 900ppm Schedule has been added
```

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```
Min CO2 concentration: Always 600ppm Schedule has been added
Generic contaminant setpoint: Always 0.5ppm Schedule has been added
Air distribution effectiveness (always 1) Schedule has been added
VRF Heating Cooling (Northern Hemisphere) Schedule has been added
DefaultFanEffRatioCurve Curve:Cubic Object has been added
VRFTUCoolCapFT Curve:Cubic Object has been added
VRFTUHeatCapFT Curve:Cubic Object has been added
VRFCoolCapFTBoundary Curve:Cubic Object has been added
VRFCoolEIRFTBoundary Curve:Cubic Object has been added
CoolingEIRLowPLR Curve:Cubic Object has been added
VRFHeatCapFTBoundary Curve:Cubic Object has been added
VRFHeatEIRFTBoundary Curve:Cubic Object has been added
HeatingEIRLowPLR Curve:Cubic Object has been added
DefaultFanPowerRatioCurve Curve:Exponent Object has been added
DXHtgCoilDefrostEIRFT Curve:Biquadratic Object has been added
VRFCoolCapFT Curve:Biquadratic Object has been added
VRFCoolCapFTHi Curve:Biquadratic Object has been added
VRFCoolEIRFT Curve:Biquadratic Object has been added
VRFCoolEIRFTHi Curve:Biquadratic Object has been added
VRFHeatCapFT Curve:Biquadratic Object has been added
VRFHeatCapFTHi Curve:Biquadratic Object has been added
VRFHeatEIRFT Curve:Biquadratic Object has been added
VRFHeatEIRFTHi Curve:Biquadratic Object has been added
CoolingLengthCorrectionFactor Curve:Biquadratic Object has been added
VRF Piping Correction Factor for Length in Heating Mode Curve:Biquadratic Object has␣
↪been added
VRF Heat Recovery Cooling Capacity Modifier Curve:Biquadratic Object has been added
VRF Heat Recovery Cooling Energy Modifier Curve:Biquadratic Object has been added
VRF Heat Recovery Heating Capacity Modifier Curve:Biquadratic Object has been added
VRF Heat Recovery Heating Energy Modifier Curve:Biquadratic Object has been added
VRFACCoolCapFFF Curve:Quadratic Object has been added
CoolingEIRHiPLR Curve:Quadratic Object has been added
VRFCPLFFPLR Curve:Quadratic Object has been added
HeatingEIRHiPLR Curve:Quadratic Object has been added
CoolingCombRatio Curve:Linear Object has been added
HeatingCombRatio Curve:Linear Object has been added
VRF Outdoor Unit_BLOCK1:ZONE2 AirConditioner:VariableRefrigerantFlow Object has been␣
↪added
VRF Outdoor Unit_BLOCK1:ZONE1 AirConditioner:VariableRefrigerantFlow Object has been␣
↪added
VRF Outdoor Unit_BLOCK1:ZONE2 Outdoor Air Node Object has been added
VRF Outdoor Unit_BLOCK1:ZONE2 Zone List Object has been added
VRF Outdoor Unit_BLOCK1:ZONE1 Outdoor Air Node Object has been added
VRF Outdoor Unit_BLOCK1:ZONE1 Zone List Object has been added
BLOCK1:ZONE2 Sizing:Zone Object has been added
BLOCK1:ZONE1 Sizing:Zone Object has been added
BLOCK1:ZONE2 Design Specification Outdoor Air Object has been added
BLOCK1:ZONE1 Design Specification Outdoor Air Object has been added
BLOCK1:ZONE2 Design Specification Zone Air Distribution Object has been added
BLOCK1:ZONE1 Design Specification Zone Air Distribution Object has been added
BLOCK1:ZONE2 Nodelist Objects has been added
BLOCK1:ZONE1 Nodelist Objects has been added
```

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```
BLOCK1:ZONE2 ZoneHVAC:EquipmentConnections Objects has been added
BLOCK1:ZONE1 ZoneHVAC:EquipmentConnections Objects has been added
BLOCK1:ZONE2 ZoneHVAC:EquipmentList Objects has been added
BLOCK1:ZONE1 ZoneHVAC:EquipmentList Objects has been added
BLOCK1:ZONE2 ZoneHVAC:TerminalUnit:VariableRefrigerantFlow Object has been added
BLOCK1:ZONE1 ZoneHVAC:TerminalUnit:VariableRefrigerantFlow Object has been added
BLOCK1:ZONE2 Coil:Cooling:DX:VariableRefrigerantFlow Object has been added
BLOCK1:ZONE1 Coil:Cooling:DX:VariableRefrigerantFlow Object has been added
BLOCK1:ZONE2 Coil:Heating:DX:VariableRefrigerantFlow Object has been added
BLOCK1:ZONE1 Coil:Heating:DX:VariableRefrigerantFlow Object has been added
BLOCK1:ZONE2 Fan:ConstantVolume Object has been added
BLOCK1:ZONE1 Fan:ConstantVolume Object has been added
Vent_SP_temp Schedule has been added
AHST_Sch_BLOCK1_ZONE2 Schedule has been added
ACST_Sch_BLOCK1_ZONE2 Schedule has been added
AHST_Sch_BLOCK1_ZONE1 Schedule has been added
ACST_Sch_BLOCK1_ZONE1 Schedule has been added
Added - SetComfTemp Program
Added - CountHours_BLOCK1_ZONE2 Program
Added - CountHours_BLOCK1_ZONE1 Program
Added - SetAppLimits Program
Added - ApplyCAT Program
Added - SetAST Program
Added - SetASTnoTol Program
Added - CountHoursNoApp_BLOCK1_ZONE2 Program
Added - SetGeoVarBLOCK1_ZONE2 Program
Added - CountHoursNoApp_BLOCK1_ZONE1 Program
Added - SetGeoVarBLOCK1_ZONE1 Program
Added - SetInputData Program
Added - SetVOFinputData Program
Added - SetVST Program
Added - ApplyAST_BLOCK1_ZONE2 Program
Added - ApplyAST_BLOCK1_ZONE1 Program
Added - SetMyVOF_Block1_Zone2_Wall_3_0_0_0_0_0_Win Program
Added - SetWindowOperation_Block1_Zone2_Wall_3_0_0_0_0_0_Win Program
Added - SetMyVOF_Block1_Zone2_Wall_4_0_0_0_0_0_Win Program
Added - SetWindowOperation_Block1_Zone2_Wall_4_0_0_0_0_0_Win Program
Added - SetMyVOF_Block1_Zone2_Wall_5_0_0_0_0_0_Win Program
Added - SetWindowOperation_Block1_Zone2_Wall_5_0_0_0_0_0_Win Program
Added - SetMyVOF_Block1_Zone1_Wall_2_0_0_0_0_0_Win Program
Added - SetWindowOperation_Block1_Zone1_Wall_2_0_0_0_0_0_Win Program
Added - SetMyVOF_Block1_Zone1_Wall_3_0_0_0_0_0_Win Program
Added - SetWindowOperation_Block1_Zone1_Wall_3_0_0_0_0_0_Win Program
Added - SetMyVOF_Block1_Zone1_Wall_5_0_0_0_0_0_Win Program
Added - SetWindowOperation_Block1_Zone1_Wall_5_0_0_0_0_0_Win Program
Added - Comfort Temperature Output Variable
Added - Adaptive Cooling Setpoint Temperature Output Variable
Added - Adaptive Heating Setpoint Temperature Output Variable
Added - Adaptive Cooling Setpoint Temperature_No Tolerance Output Variable
Added - Adaptive Heating Setpoint Temperature_No Tolerance Output Variable
Added - Ventilation Setpoint Temperature Output Variable
Added - Minimum Outdoor Temperature for ventilation Output Variable
```

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```
Added - Minimum Outdoor Temperature Difference for ventilation Output Variable
Added - Maximum Outdoor Temperature Difference for ventilation Output Variable
Added - Multiplier for Ventilation Opening Factor Output Variable
Added - Comfortable Hours_No Applicability_BLOCK1_ZONE2 Output Variable
Added - Comfortable Hours_No Applicability_BLOCK1_ZONE1 Output Variable
Added - Comfortable Hours_Applicability_BLOCK1_ZONE2 Output Variable
Added - Comfortable Hours_Applicability_BLOCK1_ZONE1 Output Variable
Added - Discomfortable Applicable Hot Hours_BLOCK1_ZONE2 Output Variable
Added - Discomfortable Applicable Hot Hours_BLOCK1_ZONE1 Output Variable
Added - Discomfortable Applicable Cold Hours_BLOCK1_ZONE2 Output Variable
Added - Discomfortable Applicable Cold Hours_BLOCK1_ZONE1 Output Variable
Added - Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE2 Output Variable
Added - Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE1 Output Variable
Added - Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE2 Output Variable
Added - Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE1 Output Variable
Added - Zone Floor Area_BLOCK1_ZONE2 Output Variable
Added - Zone Floor Area_BLOCK1_ZONE1 Output Variable
Added - Zone Air Volume_BLOCK1_ZONE2 Output Variable
Added - Zone Air Volume_BLOCK1_ZONE1 Output Variable
Added - Ventilation Hours_BLOCK1_ZONE2 Output Variable
Added - Ventilation Hours_BLOCK1_ZONE1 Output Variable
Global variables objects have been added
Internal variables objects have been added
Added - RMOT Sensor
Added - PMOT Sensor
Added - BLOCK1_ZONE2_OpT Sensor
Added - BLOCK1_ZONE2_WindSpeed Sensor
Added - BLOCK1_ZONE2_OutT Sensor
Added - BLOCK1_ZONE1_OpT Sensor
Added - BLOCK1_ZONE1_WindSpeed Sensor
Added - BLOCK1_ZONE1_OutT Sensor
Added - Block1_Zone2_Wall_3_0_0_0_0_0_Win_OpT Sensor
Added - Block1_Zone2_Wall_3_0_0_0_0_0_Win_WindSpeed Sensor
Added - Block1_Zone2_Wall_3_0_0_0_0_0_Win_OutT Sensor
Added - Block1_Zone2_Wall_4_0_0_0_0_0_Win_OpT Sensor
Added - Block1_Zone2_Wall_4_0_0_0_0_0_Win_WindSpeed Sensor
Added - Block1_Zone2_Wall_4_0_0_0_0_0_Win_OutT Sensor
Added - Block1_Zone2_Wall_5_0_0_0_0_0_Win_OpT Sensor
Added - Block1_Zone2_Wall_5_0_0_0_0_0_Win_WindSpeed Sensor
Added - Block1_Zone2_Wall_5_0_0_0_0_0_Win_OutT Sensor
Added - Block1_Zone1_Wall_2_0_0_0_0_0_Win_OpT Sensor
Added - Block1_Zone1_Wall_2_0_0_0_0_0_Win_WindSpeed Sensor
Added - Block1_Zone1_Wall_2_0_0_0_0_0_Win_OutT Sensor
Added - Block1_Zone1_Wall_3_0_0_0_0_0_Win_OpT Sensor
Added - Block1_Zone1_Wall_3_0_0_0_0_0_Win_WindSpeed Sensor
Added - Block1_Zone1_Wall_3_0_0_0_0_0_Win_OutT Sensor
Added - Block1_Zone1_Wall_5_0_0_0_0_0_Win_OpT Sensor
Added - Block1_Zone1_Wall_5_0_0_0_0_0_Win_WindSpeed Sensor
Added - Block1_Zone1_Wall_5_0_0_0_0_0_Win_OutT Sensor
Added - OutT Sensor
Added - AHST_Act_BLOCK1_ZONE2 Actuator
Added - ACST_Act_BLOCK1_ZONE2 Actuator
```

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```
Added - AHST_Act_BLOCK1_ZONE1 Actuator
Added - ACST_Act_BLOCK1_ZONE1 Actuator
Added - Block1_Zone2_Wall_3_0_0_0_0_0_Win_VentOpenFact Actuator
Added - Block1_Zone2_Wall_4_0_0_0_0_0_Win_VentOpenFact Actuator
Added - Block1_Zone2_Wall_5_0_0_0_0_0_Win_VentOpenFact Actuator
Added - Block1_Zone1_Wall_2_0_0_0_0_0_Win_VentOpenFact Actuator
Added - Block1_Zone1_Wall_3_0_0_0_0_0_Win_VentOpenFact Actuator
Added - Block1_Zone1_Wall_5_0_0_0_0_0_Win_VentOpenFact Actuator
Added - BLOCK1_ZONE2_CoolCoil Sensor
Added - BLOCK1_ZONE2_HeatCoil Sensor
Added - BLOCK1_ZONE1_CoolCoil Sensor
Added - BLOCK1_ZONE1_HeatCoil Sensor
Added - Block1_Zone2_Wall_3_0_0_0_0_0_Win_CoolCoil Sensor
Added - Block1_Zone2_Wall_3_0_0_0_0_0_Win_HeatCoil Sensor
Added - Block1_Zone2_Wall_4_0_0_0_0_0_Win_CoolCoil Sensor
Added - Block1_Zone2_Wall_4_0_0_0_0_0_Win_HeatCoil Sensor
Added - Block1_Zone2_Wall_5_0_0_0_0_0_Win_CoolCoil Sensor
Added - Block1_Zone2_Wall_5_0_0_0_0_0_Win_HeatCoil Sensor
Added - Block1_Zone1_Wall_2_0_0_0_0_0_Win_CoolCoil Sensor
Added - Block1_Zone1_Wall_2_0_0_0_0_0_Win_HeatCoil Sensor
Added - Block1_Zone1_Wall_3_0_0_0_0_0_Win_CoolCoil Sensor
Added - Block1_Zone1_Wall_3_0_0_0_0_0_Win_HeatCoil Sensor
Added - Block1_Zone1_Wall_5_0_0_0_0_0_Win_CoolCoil Sensor
Added - Block1_Zone1_Wall_5_0_0_0_0_0_Win_HeatCoil Sensor
Added - SetComfTemp Program Calling Manager
Added - CountHours_BLOCK1_ZONE2 Program Calling Manager
Added - CountHours_BLOCK1_ZONE1 Program Calling Manager
Added - SetAppLimits Program Calling Manager
Added - ApplyCAT Program Calling Manager
Added - SetAST Program Calling Manager
Added - SetASTnoTol Program Calling Manager
Added - CountHoursNoApp_BLOCK1_ZONE2 Program Calling Manager
Added - SetGeoVarBLOCK1_ZONE2 Program Calling Manager
Added - CountHoursNoApp_BLOCK1_ZONE1 Program Calling Manager
Added - SetGeoVarBLOCK1_ZONE1 Program Calling Manager
Added - SetInputData Program Calling Manager
Added - SetVOFinputData Program Calling Manager
Added - SetVST Program Calling Manager
Added - ApplyAST_BLOCK1_ZONE2 Program Calling Manager
Added - ApplyAST_BLOCK1_ZONE1 Program Calling Manager
Added - SetMyVOF_Block1_Zone2_Wall_3_0_0_0_0_0_Win Program Calling Manager
Added - SetWindowOperation_Block1_Zone2_Wall_3_0_0_0_0_0_Win Program Calling Manager
Added - SetMyVOF_Block1_Zone2_Wall_4_0_0_0_0_0_Win Program Calling Manager
Added - SetWindowOperation_Block1_Zone2_Wall_4_0_0_0_0_0_Win Program Calling Manager
Added - SetMyVOF_Block1_Zone2_Wall_5_0_0_0_0_0_Win Program Calling Manager
Added - SetWindowOperation_Block1_Zone2_Wall_5_0_0_0_0_0_Win Program Calling Manager
Added - SetMyVOF_Block1_Zone1_Wall_2_0_0_0_0_0_Win Program Calling Manager
Added - SetWindowOperation_Block1_Zone1_Wall_2_0_0_0_0_0_Win Program Calling Manager
Added - SetMyVOF_Block1_Zone1_Wall_3_0_0_0_0_0_Win Program Calling Manager
Added - SetWindowOperation_Block1_Zone1_Wall_3_0_0_0_0_0_Win Program Calling Manager
Added - SetMyVOF_Block1_Zone1_Wall_5_0_0_0_0_0_Win Program Calling Manager
Added - SetWindowOperation_Block1_Zone1_Wall_5_0_0_0_0_0_Win Program Calling Manager
```

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```
Added - Comfort Temperature Reporting FrequencyHourly Output:Variable data
Added - Adaptive Cooling Setpoint Temperature Reporting FrequencyHourly Output:Variable␣
↪data
Added - Adaptive Heating Setpoint Temperature Reporting FrequencyHourly Output:Variable␣
↪data
Added - Adaptive Cooling Setpoint Temperature_No Tolerance Reporting FrequencyHourly␣
↪Output:Variable data
Added - Adaptive Heating Setpoint Temperature_No Tolerance Reporting FrequencyHourly␣
↪Output:Variable data
Added - Ventilation Setpoint Temperature Reporting FrequencyHourly Output:Variable data
Added - Minimum Outdoor Temperature for ventilation Reporting FrequencyHourly Output:
↪Variable data
Added - Minimum Outdoor Temperature Difference for ventilation Reporting FrequencyHourly␣
↪Output:Variable data
Added - Maximum Outdoor Temperature Difference for ventilation Reporting FrequencyHourly␣
↪Output:Variable data
Added - Multiplier for Ventilation Opening Factor Reporting FrequencyHourly Output:
↪Variable data
Added - Comfortable Hours_No Applicability_BLOCK1_ZONE2 Reporting FrequencyHourly Output:
↪Variable data
Added - Comfortable Hours_No Applicability_BLOCK1_ZONE1 Reporting FrequencyHourly Output:
↪Variable data
Added - Comfortable Hours_Applicability_BLOCK1_ZONE2 Reporting FrequencyHourly Output:
↪Variable data
Added - Comfortable Hours_Applicability_BLOCK1_ZONE1 Reporting FrequencyHourly Output:
↪Variable data
Added - Discomfortable Applicable Hot Hours_BLOCK1_ZONE2 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Applicable Hot Hours_BLOCK1_ZONE1 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Applicable Cold Hours_BLOCK1_ZONE2 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Applicable Cold Hours_BLOCK1_ZONE1 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE2 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE1 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE2 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE1 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Zone Floor Area_BLOCK1_ZONE2 Reporting FrequencyHourly Output:Variable data
Added - Zone Floor Area_BLOCK1_ZONE1 Reporting FrequencyHourly Output:Variable data
Added - Zone Air Volume_BLOCK1_ZONE2 Reporting FrequencyHourly Output:Variable data
Added - Zone Air Volume_BLOCK1_ZONE1 Reporting FrequencyHourly Output:Variable data
Added - Ventilation Hours_BLOCK1_ZONE2 Reporting FrequencyHourly Output:Variable data
Added - Ventilation Hours_BLOCK1_ZONE1 Reporting FrequencyHourly Output:Variable data
Added - Zone Operative Temperature Reporting FrequencyHourly Output:Variable data
Added - Zone Thermal Comfort CEN 15251 Adaptive Model Running Average Outdoor Air␣
↪Temperature Reporting FrequencyHourly Output:Variable data
Added - Zone Thermal Comfort ASHRAE 55 Adaptive Model Running Average Outdoor Air␣
```

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```
↪Temperature Reporting FrequencyHourly Output:Variable data
Added - Cooling Coil Total Cooling Rate Reporting FrequencyHourly Output:Variable data
Added - Heating Coil Heating Rate Reporting FrequencyHourly Output:Variable data
Added - Facility Total HVAC Electric Demand Power Reporting FrequencyHourly Output:
↪Variable data
Added - Facility Total HVAC Electricity Demand Rate Reporting FrequencyHourly Output:
↪Variable data
Added - AFN Surface Venting Window or Door Opening Factor Reporting FrequencyHourly␣
↪Output:Variable data
Added - AFN Zone Infiltration Air Change Rate Reporting FrequencyHourly Output:Variable␣
↪data
Added - AFN Zone Infiltration Volume Reporting FrequencyHourly Output:Variable data
Added - AFN Zone Ventilation Air Change Rate Reporting FrequencyHourly Output:Variable␣
↪data
Added - AFN Zone Ventilation Volume Reporting FrequencyHourly Output:Variable data
Added - Site Outdoor Air Drybulb Temperature Reporting FrequencyHourly Output:Variable␣
↪data
Added - Site Wind Speed Reporting FrequencyHourly Output:Variable data
Added - Site Outdoor Air Relative Humidity Reporting FrequencyHourly Output:Variable data
Added - AHST_Sch_BLOCK1_ZONE2 Reporting FrequencyHourly Output:Variable data
Added - ACST_Sch_BLOCK1_ZONE2 Reporting FrequencyHourly Output:Variable data
Added - AHST_Sch_BLOCK1_ZONE1 Reporting FrequencyHourly Output:Variable data
Added - ACST_Sch_BLOCK1_ZONE1 Reporting FrequencyHourly Output:Variable data
Added - VRF Heat Pump Cooling Electricity Energy Reporting FrequencyHourly Output:
↪Variable data
Added - VRF Heat Pump Heating Electricity Energy Reporting FrequencyHourly Output:
↪Variable data
Added - BLOCK1_ZONE2 VRF Indoor Unit DX Cooling Coil Reporting FrequencyHourly Output:
↪Variable data
Added - BLOCK1_ZONE2 VRF Indoor Unit DX Heating Coil Reporting Frequency Hourly Output:
↪Variable data
Added - BLOCK1_ZONE1 VRF Indoor Unit DX Cooling Coil Reporting FrequencyHourly Output:
↪Variable data
Added - BLOCK1_ZONE1 VRF Indoor Unit DX Heating Coil Reporting Frequency Hourly Output:
↪Variable data
Added - Comfort Temperature Reporting FrequencyRunperiod Output:Variable data
Added - Adaptive Cooling Setpoint Temperature Reporting FrequencyRunperiod Output:
↪Variable data
Added - Adaptive Heating Setpoint Temperature Reporting FrequencyRunperiod Output:
↪Variable data
Added - Adaptive Cooling Setpoint Temperature_No Tolerance Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Adaptive Heating Setpoint Temperature_No Tolerance Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Ventilation Setpoint Temperature Reporting FrequencyRunperiod Output:Variable␣
↪data
Added - Minimum Outdoor Temperature for ventilation Reporting FrequencyRunperiod Output:
↪Variable data
Added - Minimum Outdoor Temperature Difference for ventilation Reporting␣
↪FrequencyRunperiod Output:Variable data
Added - Maximum Outdoor Temperature Difference for ventilation Reporting␣
↪FrequencyRunperiod Output:Variable data
```

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```
Added - Multiplier for Ventilation Opening Factor Reporting FrequencyRunperiod Output:
↪Variable data
Added - Comfortable Hours_No Applicability_BLOCK1_ZONE2 Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Comfortable Hours_No Applicability_BLOCK1_ZONE1 Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Comfortable Hours_Applicability_BLOCK1_ZONE2 Reporting FrequencyRunperiod Output:
↪Variable data
Added - Comfortable Hours_Applicability_BLOCK1_ZONE1 Reporting FrequencyRunperiod Output:
↪Variable data
Added - Discomfortable Applicable Hot Hours_BLOCK1_ZONE2 Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Discomfortable Applicable Hot Hours_BLOCK1_ZONE1 Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Discomfortable Applicable Cold Hours_BLOCK1_ZONE2 Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Discomfortable Applicable Cold Hours_BLOCK1_ZONE1 Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE2 Reporting␣
↪FrequencyRunperiod Output:Variable data
Added - Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE1 Reporting␣
↪FrequencyRunperiod Output:Variable data
Added - Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE2 Reporting␣
↪FrequencyRunperiod Output:Variable data
Added - Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE1 Reporting␣
↪FrequencyRunperiod Output:Variable data
Added - Zone Floor Area_BLOCK1_ZONE2 Reporting FrequencyRunperiod Output:Variable data
Added - Zone Floor Area_BLOCK1_ZONE1 Reporting FrequencyRunperiod Output:Variable data
Added - Zone Air Volume_BLOCK1_ZONE2 Reporting FrequencyRunperiod Output:Variable data
Added - Zone Air Volume_BLOCK1_ZONE1 Reporting FrequencyRunperiod Output:Variable data
Added - Ventilation Hours_BLOCK1_ZONE2 Reporting FrequencyRunperiod Output:Variable data
Added - Ventilation Hours_BLOCK1_ZONE1 Reporting FrequencyRunperiod Output:Variable data
Added - Zone Operative Temperature Reporting FrequencyRunperiod Output:Variable data
Added - Zone Thermal Comfort CEN 15251 Adaptive Model Running Average Outdoor Air␣
↪Temperature Reporting FrequencyRunperiod Output:Variable data
Added - Zone Thermal Comfort ASHRAE 55 Adaptive Model Running Average Outdoor Air␣
↪Temperature Reporting FrequencyRunperiod Output:Variable data
Added - Cooling Coil Total Cooling Rate Reporting FrequencyRunperiod Output:Variable data
Added - Heating Coil Heating Rate Reporting FrequencyRunperiod Output:Variable data
Added - Facility Total HVAC Electric Demand Power Reporting FrequencyRunperiod Output:
↪Variable data
Added - Facility Total HVAC Electricity Demand Rate Reporting FrequencyRunperiod Output:
↪Variable data
Added - AFN Surface Venting Window or Door Opening Factor Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - AFN Zone Infiltration Air Change Rate Reporting FrequencyRunperiod Output:
↪Variable data
Added - AFN Zone Infiltration Volume Reporting FrequencyRunperiod Output:Variable data
Added - AFN Zone Ventilation Air Change Rate Reporting FrequencyRunperiod Output:
↪Variable data
Added - AFN Zone Ventilation Volume Reporting FrequencyRunperiod Output:Variable data
Added - Site Outdoor Air Drybulb Temperature Reporting FrequencyRunperiod Output:
```

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```
↪Variable data
Added - Site Wind Speed Reporting FrequencyRunperiod Output:Variable data
Added - Site Outdoor Air Relative Humidity Reporting FrequencyRunperiod Output:Variable␣
↪data
Added - AHST_Sch_BLOCK1_ZONE2 Reporting FrequencyRunperiod Output:Variable data
Added - ACST_Sch_BLOCK1_ZONE2 Reporting FrequencyRunperiod Output:Variable data
Added - AHST_Sch_BLOCK1_ZONE1 Reporting FrequencyRunperiod Output:Variable data
Added - ACST_Sch_BLOCK1_ZONE1 Reporting FrequencyRunperiod Output:Variable data
Added - VRF Heat Pump Cooling Electricity Energy Reporting FrequencyRunperiod Output:
↪Variable data
Added - VRF Heat Pump Heating Electricity Energy Reporting FrequencyRunperiod Output:
↪Variable data
Added - BLOCK1_ZONE2 VRF Indoor Unit DX Cooling Coil Reporting FrequencyRunperiod Output:
↪Variable data
Added - BLOCK1_ZONE2 VRF Indoor Unit DX Heating Coil Reporting Frequency Runperiod␣
↪Output:Variable data
Added - BLOCK1_ZONE1 VRF Indoor Unit DX Cooling Coil Reporting FrequencyRunperiod Output:
↪Variable data
Added - BLOCK1_ZONE1 VRF Indoor Unit DX Heating Coil Reporting Frequency Runperiod␣
↪Output:Variable data
IDF has been saved
Ending with file:
TestModel

=======================END OF GENERIC IDF FILE GENERATION PROCESS=======================

The following IDFs will not work, and therefore these will be deleted:
None

=======================START OF OUTPUT IDF FILES GENERATION␣
↪PROCESS=======================

The information you will be required to enter below will be used to generate the␣
↪customised output IDFs:
Enter the Comfort Standard numbers separated by space (
0 = ESP CTE;
1 = INT EN16798-1;
2 = INT ASHRAE55;
3 = JPN Rijal;
4 = CHN GBT50785 Cold;
5 = CHN GBT50785 HotMild;
6 = CHN Yang;
7 = IND IMAC C NV;
8 = IND IMAC C MM;
9 = IND IMAC R 7DRM;
10 = IND IMAC R 30DRM;
11 = IND Dhaka;
12 = ROM Udrea;
13 = AUS Williamson;
14 = AUS DeDear;
15 = BRA Rupp NV;
16 = BRA Rupp AC;
```

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```
17 = MEX Oropeza Arid;
18 = MEX Oropeza DryTropic;
19 = MEX Oropeza Temperate;
20 = MEX Oropeza HumTropic;
21 = CHL Perez-Fargallo;
22 = INT ISO7730;
Please refer to the full list of setpoint temperatures at https://htmlpreview.github.io/?
↪https://github.com/dsanchez-garcia/accim/blob/master/accim/docs/html_files/full_
↪setpoint_table.html
): 1 14
          Are you sure the numbers are correct? [y or [] / n]:


For the comfort standard 1 = INT EN16798, the available categories you can choose are:
1 = EN16798 Category I
2 = EN16798 Category II
3 = EN16798 Category III
For the comfort standard 14 = AUS DeDear, the available categories you can choose are:
80 = 80% acceptability
90 = 90% acceptability
Enter the Category numbers separated by space (
1 = CAT I / CAT A;
2 = CAT II / CAT B;
3 = CAT III / CAT C;
80 = 80% ACCEPT;
85 = 85% ACCEPT;
90 = 90% ACCEPT;
Please refer to the full list of setpoint temperatures at https://htmlpreview.github.io/?
↪https://github.com/dsanchez-garcia/accim/blob/master/accim/docs/html_files/full_
↪setpoint_table.html
): 1 2 3 80 90
          Are you sure the numbers are correct? [y or [] / n]:


For the comfort standard 1 = INT EN16798, the available ComfMods you can choose are:
0 = EN16798 Static setpoints
1 = EN16798 Adaptive setpoints when applicable, otherwise CTE
2 = EN16798 Adaptive setpoints when applicable, otherwise EN16798 Static setpoints
3 = EN16798 Adaptive setpoints when applicable, otherwise EN16798 Adaptive setpoints␣
↪horizontally extended
For the comfort standard 14 = AUS DeDear, the available ComfMods you can choose are:
0.1 = Australian Building Code Static setpoints for climate zones 1, 2 and 3
0.2 = Australian Building Code Static setpoints for climate zone 4
0.3 = Australian Building Code Static setpoints for climate zone 5
0.4 = Australian Building Code Static setpoints for climate zones 6 and 7
0.5 = Australian Building Code Static setpoints for climate zone 8
1.1 = DeDear Model Adaptive setpoints when applicable, otherwise Australian Building␣
↪Code Static setpoints for climate zones 1, 2 and 3
1.2 = DeDear Model Adaptive setpoints when applicable, otherwise Australian Building␣
↪Code Static setpoints for climate zone 4
1.3 = DeDear Model Adaptive setpoints when applicable, otherwise Australian Building␣
↪Code Static setpoints for climate zone 5
```

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```
1.4 = DeDear Model Adaptive setpoints when applicable, otherwise Australian Building␣
↪Code Static setpoints for climate zones 6 and 7
1.5 = DeDear Model Adaptive setpoints when applicable, otherwise Australian Building␣
↪Code Static setpoints for climate zone 8
2 = DeDear Model Adaptive setpoints when applicable, otherwise ISO 7730 Static setpoints
3 = DeDear Model Adaptive setpoints when applicable, otherwise Adaptive setpoints␣
↪horizontally extended
Enter the Comfort Mode numbers separated by space (
0 or 0.X = Static;
1, 1.X, 2, 3 = Adaptive;
Please refer to the full list of setpoint temperatures at https://htmlpreview.github.io/?
↪https://github.com/dsanchez-garcia/accim/blob/master/accim/docs/html_files/full_
↪setpoint_table.html
): 0 0.1 0.2 0.3 0.4 0.5 1 1.1 1.2 1.3 1.4 1.5 2 3
          Are you sure the numbers are correct? [y or [] / n]:

Enter the setpoint accuracy number (any number greater than 0): 100
          Are you sure the number is correct? [y or [] / n]:

Enter the start of the cooling season in numeric date format dd/mm or the day of the␣
↪year: 01/11
          Are you sure the number is correct? [y or [] / n]:

Enter the end of the cooling season in numeric date format dd/mm or the day of the year:␣
↪01/03
          Are you sure the number is correct? [y or [] / n]:

Enter the HVAC Mode numbers separated by space (
0 = Fully Air-conditioned;
1 = Naturally ventilated;
2 = Mixed Mode;
): 2
          Are you sure the numbers are correct? [y or [] / n]:

Enter the Ventilation Control numbers separated by space (
If HVACmode = 1:
   0 = Ventilates above neutral temperature;
   1 = Ventilates above upper comfort limit;
If HVACmode = 2:
   0 = Ventilates above neutral temperature and fully opens doors and windows;
   1 = Ventilates above lower comfort limit and fully opens doors and windows;
   2 = Ventilates above neutral temperature and opens doors and windows based on the␣
↪customised venting opening factor;
   3 = Ventilates above lower comfort limit and opens doors and windows based on the␣
↪customised venting opening factor;
): 2
          Are you sure the numbers are correct? [y or [] / n]:
Enter the maximum temperature difference number for Ventilation Opening Factor (any␣
↪number larger than 0): 20
          Are you sure the number is correct? [y or [] / n]:
Enter the minimum temperature difference number for Ventilation Opening Factor (any␣
↪number larger than 0 and smaller than the maximum temperature difference number): 1
```

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```
          Are you sure the number is correct? [y or [] / n]:
Enter the multiplier number for Ventilation Opening Factor (any number between 0 and 1):␣
↪0.2
          Are you sure the number is correct? [y or [] / n]:

Enter the VSToffset numbers separated by space (if omitted, will be 0):
          Are you sure the numbers are correct? [y or [] / n]:

Enter the MinOToffset numbers separated by space (if omitted, will be 50):
          Are you sure the numbers are correct? [y or [] / n]:

Enter the MaxWindSpeed numbers separated by space (if omitted, will be 50):
          Are you sure the numbers are correct? [y or [] / n]:

Enter the ASTtol value from (if omitted, will be 0.1):
          Are you sure the numbers are correct? [y or [] / n]:
Enter the ASTtol value to (if omitted, will be 0.1):
          Are you sure the numbers are correct? [y or [] / n]:
Enter the ASTtol value steps (if omitted, will be 0.1):
          Are you sure the numbers are correct? [y or [] / n]:
The list of output IDFs is going to be:
TestModel[CS_INT EN16798[CA_1[CM_0.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_1[CM_1.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_1[CM_2.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_1[CM_3.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_0.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_1.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
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TestModel[CS_AUS DeDear[CA_80[CM_0.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
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TestModel[CS_AUS DeDear[CA_80[CM_1.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
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TestModel[CS_AUS DeDear[CA_80[CM_3.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
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TestModel[CS_AUS DeDear[CA_90[CM_1.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_2.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_3.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
And the total number of output IDFs is going to be 36
Do you still want to run ACCIS? [y/n]: y
Generating the following output IDF files:
TestModel[CS_INT EN16798[CA_1[CM_0.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_1[CM_1.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_1[CM_2.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_1[CM_3.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_0.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_1.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_2.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_3.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_0.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_1.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_2.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_3.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
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TestModel[CS_AUS DeDear[CA_80[CM_0.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
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TestModel[CS_AUS DeDear[CA_80[CM_1.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_2.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_3.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
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TestModel[CS_AUS DeDear[CA_90[CM_0.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
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TestModel[CS_AUS DeDear[CA_90[CM_1.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_2.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_3.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf

=======================END OF OUTPUT IDF FILES GENERATION PROCESS=======================
```

[3]:
```
<accim.sim.accis.addAccis at 0x202ac1cb8b0>
```

Let's see what files we do have now in the folder:

[4]:
```
os.listdir()
```

[4]:
```
['.ipynb_checkpoints',
 'TestModel.idf',
 'TestModel[CS_AUS DeDear[CA_80[CM_0.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_80[CM_0.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_80[CM_0.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_80[CM_0.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_80[CM_0.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_80[CM_1.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_80[CM_1.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_80[CM_1.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_80[CM_1.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_80[CM_1.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_80[CM_2.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_80[CM_3.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_90[CM_0.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_90[CM_0.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_90[CM_0.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_90[CM_0.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_90[CM_0.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_90[CM_1.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_90[CM_1.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_90[CM_1.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_90[CM_1.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_90[CM_1.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_90[CM_2.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_90[CM_3.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_INT EN16798[CA_1[CM_0.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_INT EN16798[CA_1[CM_1.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_INT EN16798[CA_1[CM_2.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_INT EN16798[CA_1[CM_3.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_INT EN16798[CA_2[CM_0.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_INT EN16798[CA_2[CM_1.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_INT EN16798[CA_2[CM_2.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_INT EN16798[CA_2[CM_3.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_INT EN16798[CA_3[CM_0.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_INT EN16798[CA_3[CM_1.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_INT EN16798[CA_3[CM_2.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_INT EN16798[CA_3[CM_3.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'using_addAccis.ipynb',
 '__init__.py']
```

We can see there are new IDFs, as stated previously in the python console:

[5]:
```
output_idfs = [i for i in os.listdir() if not(any(i in j for j in input_idf)) and i.
↪endswith('.idf')]
print(*output_idfs, sep='\n')
```

```
TestModel[CS_AUS DeDear[CA_80[CM_0.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
```

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```
TestModel[CS_AUS DeDear[CA_80[CM_1.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_2.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_3.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_2.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_3.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_1[CM_0.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_1[CM_1.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_1[CM_2.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_1[CM_3.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_0.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_1.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_2.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_3.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_0.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_1.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_2.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_3.0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
```

Now, these are ready for simulation with any EPW file, although it is recommended to have previously renamed them with the class rename_epw_files().

Let's remove the new output IDFs for clarity purposes:

[6]:
```
for i in os.listdir():
    if i.endswith('.idf') and input_idf[0] not in i:
        os.remove(i)
```

8.1.2 1.2 Longer version

Let's double check we only have the initial idf we used in the short version:

[7]:
```
input_idf = [i for i in os.listdir() if i.endswith('.idf')]
print(*input_idf, sep='\n')
```

```
TestModel.idf
```

Now, let's do the same, but using the longer version:

[8]:
```
from accim.sim import accis
accis.addAccis(
    ScriptType='vrf_mm',
    SupplyAirTempInputMethod='temperature difference',
    Output_keep_existing=False,
    Output_type='standard',
    Output_freqs=['hourly', 'runperiod'],
    Output_gen_dataframe=False,
    EnergyPlus_version='23.1',
    TempCtrl='temperature',
    ComfStand=[1, 14],
    CAT=[1, 2, 3, 80, 90],
    ComfMod=[0, 0.1, 0.2, 0.3, 0.4, 0.5, 1, 1.1, 1.2, 1.3, 1.4, 1.5, 2, 3],
    SetpointAcc=100,
    CoolSeasonStart='01/11',
    CoolSeasonEnd='01/03',
    HVACmode=[2],
    VentCtrl=[2],
    MaxTempDiffVOF=20,
    MinTempDiffVOF=1,
    MultiplierVOF=0.2,
    VSToffset=[0],
    MinOToffset=[50],
    MaxWindSpeed=[50],
    ASTtol_steps=0.1,
    ASTtol_start=0.1,
    ASTtol_end_input=0.1,
    confirmGen=True
)
```

```
------------------------------------------------------------
Adaptive-Comfort-Control-Implemented Model (ACCIM) v0.7.0
------------------------------------------------------------

This tool allows to apply adaptive setpoint temperatures.
For further information, please read the documentation:
https://accim.readthedocs.io/en/master/
For a visual understanding of the tool, please visit the following jupyter notebooks:
-    Using addAccis() to apply adaptive setpoint temperatures
https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_
↪notebooks/addAccis/using_addAccis.ipynb
-    Using rename_epw_files() to rename the EPWs for proper data analysis after␣
↪simulation
https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_
↪notebooks/rename_epw_files/using_rename_epw_files.ipynb
-    Using runEp() to directly run simulations with EnergyPlus
https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_
↪notebooks/runEp/using_runEp.ipynb
-    Using the class Table() for data analysis
https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_
↪notebooks/Table/using_Table.ipynb
-    Full example
```

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```
https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_
↪notebooks/Table/using_Table.ipynb

Starting with the process.
Basic input data:
ScriptType is: vrf_mm
Supply Air Temperature Input Method is: temperature difference
Output type is: standard
Output frequencies are:
['hourly', 'runperiod']
EnergyPlus version is: 23.1
Temperature Control method is: temperature

======================START OF GENERIC IDF FILE GENERATION␣
↪PROCESS======================

Starting with file:
TestModel
IDD location is: C:\EnergyPlusV23-1-0\Energy+.idd
The occupied zones in the model TestModel are:
BLOCK1:ZONE2
BLOCK1:ZONE1
The windows and doors in the model TestModel are:
Block1_Zone2_Wall_3_0_0_0_0_0_Win
Block1_Zone2_Wall_4_0_0_0_0_0_Win
Block1_Zone2_Wall_5_0_0_0_0_0_Win
Block1_Zone1_Wall_2_0_0_0_0_0_Win
Block1_Zone1_Wall_3_0_0_0_0_0_Win
Block1_Zone1_Wall_5_0_0_0_0_0_Win
The zones in the model TestModel are:
BLOCK1_ZONE2
BLOCK1_ZONE1
The people objects in the model have been amended.
BLOCK1:ZONE2 Thermostat has been added
BLOCK1:ZONE1 Thermostat has been added
On Schedule already was in the model
TypOperativeTempControlSch Schedule already was in the model
All ZoneHVAC:IdealLoadsAirSystem Heating and Cooling availability schedules has been set␣
↪to on
On 24/7 Schedule already was in the model
Control type schedule: Always 4 Schedule has been added
Relative humidity setpoint schedule: Always 50.00 Schedule has been added
Heating Fanger comfort setpoint: Always -0.5 Schedule has been added
Cooling Fanger comfort setpoint: Always  0.1 Schedule has been added
Zone CO2 setpoint: Always 900ppm Schedule has been added
Min CO2 concentration: Always 600ppm Schedule has been added
Generic contaminant setpoint: Always 0.5ppm Schedule has been added
Air distribution effectiveness (always 1) Schedule has been added
VRF Heating Cooling (Northern Hemisphere) Schedule has been added
DefaultFanEffRatioCurve Curve:Cubic Object has been added
VRFTUCoolCapFT Curve:Cubic Object has been added
VRFTUHeatCapFT Curve:Cubic Object has been added
```

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```
VRFCoolCapFTBoundary Curve:Cubic Object has been added
VRFCoolEIRFTBoundary Curve:Cubic Object has been added
CoolingEIRLowPLR Curve:Cubic Object has been added
VRFHeatCapFTBoundary Curve:Cubic Object has been added
VRFHeatEIRFTBoundary Curve:Cubic Object has been added
HeatingEIRLowPLR Curve:Cubic Object has been added
DefaultFanPowerRatioCurve Curve:Exponent Object has been added
DXHtgCoilDefrostEIRFT Curve:Biquadratic Object has been added
VRFCoolCapFT Curve:Biquadratic Object has been added
VRFCoolCapFTHi Curve:Biquadratic Object has been added
VRFCoolEIRFT Curve:Biquadratic Object has been added
VRFCoolEIRFTHi Curve:Biquadratic Object has been added
VRFHeatCapFT Curve:Biquadratic Object has been added
VRFHeatCapFTHi Curve:Biquadratic Object has been added
VRFHeatEIRFT Curve:Biquadratic Object has been added
VRFHeatEIRFTHi Curve:Biquadratic Object has been added
CoolingLengthCorrectionFactor Curve:Biquadratic Object has been added
VRF Piping Correction Factor for Length in Heating Mode Curve:Biquadratic Object has␣
↪been added
VRF Heat Recovery Cooling Capacity Modifier Curve:Biquadratic Object has been added
VRF Heat Recovery Cooling Energy Modifier Curve:Biquadratic Object has been added
VRF Heat Recovery Heating Capacity Modifier Curve:Biquadratic Object has been added
VRF Heat Recovery Heating Energy Modifier Curve:Biquadratic Object has been added
VRFACCoolCapFFF Curve:Quadratic Object has been added
CoolingEIRHiPLR Curve:Quadratic Object has been added
VRFCPLFFPLR Curve:Quadratic Object has been added
HeatingEIRHiPLR Curve:Quadratic Object has been added
CoolingCombRatio Curve:Linear Object has been added
HeatingCombRatio Curve:Linear Object has been added
VRF Outdoor Unit_BLOCK1:ZONE2 AirConditioner:VariableRefrigerantFlow Object has been␣
↪added
VRF Outdoor Unit_BLOCK1:ZONE1 AirConditioner:VariableRefrigerantFlow Object has been␣
↪added
VRF Outdoor Unit_BLOCK1:ZONE2 Outdoor Air Node Object has been added
VRF Outdoor Unit_BLOCK1:ZONE2 Zone List Object has been added
VRF Outdoor Unit_BLOCK1:ZONE1 Outdoor Air Node Object has been added
VRF Outdoor Unit_BLOCK1:ZONE1 Zone List Object has been added
BLOCK1:ZONE2 Sizing:Zone Object has been added
BLOCK1:ZONE1 Sizing:Zone Object has been added
BLOCK1:ZONE2 Design Specification Outdoor Air Object has been added
BLOCK1:ZONE1 Design Specification Outdoor Air Object has been added
BLOCK1:ZONE2 Design Specification Zone Air Distribution Object has been added
BLOCK1:ZONE1 Design Specification Zone Air Distribution Object has been added
BLOCK1:ZONE2 Nodelist Objects has been added
BLOCK1:ZONE1 Nodelist Objects has been added
BLOCK1:ZONE2 ZoneHVAC:EquipmentConnections Objects has been added
BLOCK1:ZONE1 ZoneHVAC:EquipmentConnections Objects has been added
BLOCK1:ZONE2 ZoneHVAC:EquipmentList Objects has been added
BLOCK1:ZONE1 ZoneHVAC:EquipmentList Objects has been added
BLOCK1:ZONE2 ZoneHVAC:TerminalUnit:VariableRefrigerantFlow Object has been added
BLOCK1:ZONE1 ZoneHVAC:TerminalUnit:VariableRefrigerantFlow Object has been added
BLOCK1:ZONE2 Coil:Cooling:DX:VariableRefrigerantFlow Object has been added
```

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```
BLOCK1:ZONE1 Coil:Cooling:DX:VariableRefrigerantFlow Object has been added
BLOCK1:ZONE2 Coil:Heating:DX:VariableRefrigerantFlow Object has been added
BLOCK1:ZONE1 Coil:Heating:DX:VariableRefrigerantFlow Object has been added
BLOCK1:ZONE2 Fan:ConstantVolume Object has been added
BLOCK1:ZONE1 Fan:ConstantVolume Object has been added
Vent_SP_temp Schedule has been added
AHST_Sch_BLOCK1_ZONE2 Schedule has been added
ACST_Sch_BLOCK1_ZONE2 Schedule has been added
AHST_Sch_BLOCK1_ZONE1 Schedule has been added
ACST_Sch_BLOCK1_ZONE1 Schedule has been added
Added - SetComfTemp Program
Added - CountHours_BLOCK1_ZONE2 Program
Added - CountHours_BLOCK1_ZONE1 Program
Added - SetAppLimits Program
Added - ApplyCAT Program
Added - SetAST Program
Added - SetASTnoTol Program
Added - CountHoursNoApp_BLOCK1_ZONE2 Program
Added - SetGeoVarBLOCK1_ZONE2 Program
Added - CountHoursNoApp_BLOCK1_ZONE1 Program
Added - SetGeoVarBLOCK1_ZONE1 Program
Added - SetInputData Program
Added - SetVOFinputData Program
Added - SetVST Program
Added - ApplyAST_BLOCK1_ZONE2 Program
Added - ApplyAST_BLOCK1_ZONE1 Program
Added - SetMyVOF_Block1_Zone2_Wall_3_0_0_0_0_0_Win Program
Added - SetWindowOperation_Block1_Zone2_Wall_3_0_0_0_0_0_Win Program
Added - SetMyVOF_Block1_Zone2_Wall_4_0_0_0_0_0_Win Program
Added - SetWindowOperation_Block1_Zone2_Wall_4_0_0_0_0_0_Win Program
Added - SetMyVOF_Block1_Zone2_Wall_5_0_0_0_0_0_Win Program
Added - SetWindowOperation_Block1_Zone2_Wall_5_0_0_0_0_0_Win Program
Added - SetMyVOF_Block1_Zone1_Wall_2_0_0_0_0_0_Win Program
Added - SetWindowOperation_Block1_Zone1_Wall_2_0_0_0_0_0_Win Program
Added - SetMyVOF_Block1_Zone1_Wall_3_0_0_0_0_0_Win Program
Added - SetWindowOperation_Block1_Zone1_Wall_3_0_0_0_0_0_Win Program
Added - SetMyVOF_Block1_Zone1_Wall_5_0_0_0_0_0_Win Program
Added - SetWindowOperation_Block1_Zone1_Wall_5_0_0_0_0_0_Win Program
Added - Comfort Temperature Output Variable
Added - Adaptive Cooling Setpoint Temperature Output Variable
Added - Adaptive Heating Setpoint Temperature Output Variable
Added - Adaptive Cooling Setpoint Temperature_No Tolerance Output Variable
Added - Adaptive Heating Setpoint Temperature_No Tolerance Output Variable
Added - Ventilation Setpoint Temperature Output Variable
Added - Minimum Outdoor Temperature for ventilation Output Variable
Added - Minimum Outdoor Temperature Difference for ventilation Output Variable
Added - Maximum Outdoor Temperature Difference for ventilation Output Variable
Added - Multiplier for Ventilation Opening Factor Output Variable
Added - Comfortable Hours_No Applicability_BLOCK1_ZONE2 Output Variable
Added - Comfortable Hours_No Applicability_BLOCK1_ZONE1 Output Variable
Added - Comfortable Hours_Applicability_BLOCK1_ZONE2 Output Variable
Added - Comfortable Hours_Applicability_BLOCK1_ZONE1 Output Variable
```

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```
Added - Discomfortable Applicable Hot Hours_BLOCK1_ZONE2 Output Variable
Added - Discomfortable Applicable Hot Hours_BLOCK1_ZONE1 Output Variable
Added - Discomfortable Applicable Cold Hours_BLOCK1_ZONE2 Output Variable
Added - Discomfortable Applicable Cold Hours_BLOCK1_ZONE1 Output Variable
Added - Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE2 Output Variable
Added - Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE1 Output Variable
Added - Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE2 Output Variable
Added - Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE1 Output Variable
Added - Zone Floor Area_BLOCK1_ZONE2 Output Variable
Added - Zone Floor Area_BLOCK1_ZONE1 Output Variable
Added - Zone Air Volume_BLOCK1_ZONE2 Output Variable
Added - Zone Air Volume_BLOCK1_ZONE1 Output Variable
Added - Ventilation Hours_BLOCK1_ZONE2 Output Variable
Added - Ventilation Hours_BLOCK1_ZONE1 Output Variable
Global variables objects have been added
Internal variables objects have been added
Added - RMOT Sensor
Added - PMOT Sensor
Added - BLOCK1_ZONE2_OpT Sensor
Added - BLOCK1_ZONE2_WindSpeed Sensor
Added - BLOCK1_ZONE2_OutT Sensor
Added - BLOCK1_ZONE1_OpT Sensor
Added - BLOCK1_ZONE1_WindSpeed Sensor
Added - BLOCK1_ZONE1_OutT Sensor
Added - Block1_Zone2_Wall_3_0_0_0_0_0_Win_OpT Sensor
Added - Block1_Zone2_Wall_3_0_0_0_0_0_Win_WindSpeed Sensor
Added - Block1_Zone2_Wall_3_0_0_0_0_0_Win_OutT Sensor
Added - Block1_Zone2_Wall_4_0_0_0_0_0_Win_OpT Sensor
Added - Block1_Zone2_Wall_4_0_0_0_0_0_Win_WindSpeed Sensor
Added - Block1_Zone2_Wall_4_0_0_0_0_0_Win_OutT Sensor
Added - Block1_Zone2_Wall_5_0_0_0_0_0_Win_OpT Sensor
Added - Block1_Zone2_Wall_5_0_0_0_0_0_Win_WindSpeed Sensor
Added - Block1_Zone2_Wall_5_0_0_0_0_0_Win_OutT Sensor
Added - Block1_Zone1_Wall_2_0_0_0_0_0_Win_OpT Sensor
Added - Block1_Zone1_Wall_2_0_0_0_0_0_Win_WindSpeed Sensor
Added - Block1_Zone1_Wall_2_0_0_0_0_0_Win_OutT Sensor
Added - Block1_Zone1_Wall_3_0_0_0_0_0_Win_OpT Sensor
Added - Block1_Zone1_Wall_3_0_0_0_0_0_Win_WindSpeed Sensor
Added - Block1_Zone1_Wall_3_0_0_0_0_0_Win_OutT Sensor
Added - Block1_Zone1_Wall_5_0_0_0_0_0_Win_OpT Sensor
Added - Block1_Zone1_Wall_5_0_0_0_0_0_Win_WindSpeed Sensor
Added - Block1_Zone1_Wall_5_0_0_0_0_0_Win_OutT Sensor
Added - OutT Sensor
Added - AHST_Act_BLOCK1_ZONE2 Actuator
Added - ACST_Act_BLOCK1_ZONE2 Actuator
Added - AHST_Act_BLOCK1_ZONE1 Actuator
Added - ACST_Act_BLOCK1_ZONE1 Actuator
Added - Block1_Zone2_Wall_3_0_0_0_0_0_Win_VentOpenFact Actuator
Added - Block1_Zone2_Wall_4_0_0_0_0_0_Win_VentOpenFact Actuator
Added - Block1_Zone2_Wall_5_0_0_0_0_0_Win_VentOpenFact Actuator
Added - Block1_Zone1_Wall_2_0_0_0_0_0_Win_VentOpenFact Actuator
Added - Block1_Zone1_Wall_3_0_0_0_0_0_Win_VentOpenFact Actuator
```

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```
Added - Block1_Zone1_Wall_5_0_0_0_0_0_Win_VentOpenFact Actuator
Added - BLOCK1_ZONE2_CoolCoil Sensor
Added - BLOCK1_ZONE2_HeatCoil Sensor
Added - BLOCK1_ZONE1_CoolCoil Sensor
Added - BLOCK1_ZONE1_HeatCoil Sensor
Added - Block1_Zone2_Wall_3_0_0_0_0_0_Win_CoolCoil Sensor
Added - Block1_Zone2_Wall_3_0_0_0_0_0_Win_HeatCoil Sensor
Added - Block1_Zone2_Wall_4_0_0_0_0_0_Win_CoolCoil Sensor
Added - Block1_Zone2_Wall_4_0_0_0_0_0_Win_HeatCoil Sensor
Added - Block1_Zone2_Wall_5_0_0_0_0_0_Win_CoolCoil Sensor
Added - Block1_Zone2_Wall_5_0_0_0_0_0_Win_HeatCoil Sensor
Added - Block1_Zone1_Wall_2_0_0_0_0_0_Win_CoolCoil Sensor
Added - Block1_Zone1_Wall_2_0_0_0_0_0_Win_HeatCoil Sensor
Added - Block1_Zone1_Wall_3_0_0_0_0_0_Win_CoolCoil Sensor
Added - Block1_Zone1_Wall_3_0_0_0_0_0_Win_HeatCoil Sensor
Added - Block1_Zone1_Wall_5_0_0_0_0_0_Win_CoolCoil Sensor
Added - Block1_Zone1_Wall_5_0_0_0_0_0_Win_HeatCoil Sensor
Added - SetComfTemp Program Calling Manager
Added - CountHours_BLOCK1_ZONE2 Program Calling Manager
Added - CountHours_BLOCK1_ZONE1 Program Calling Manager
Added - SetAppLimits Program Calling Manager
Added - ApplyCAT Program Calling Manager
Added - SetAST Program Calling Manager
Added - SetASTnoTol Program Calling Manager
Added - CountHoursNoApp_BLOCK1_ZONE2 Program Calling Manager
Added - SetGeoVarBLOCK1_ZONE2 Program Calling Manager
Added - CountHoursNoApp_BLOCK1_ZONE1 Program Calling Manager
Added - SetGeoVarBLOCK1_ZONE1 Program Calling Manager
Added - SetInputData Program Calling Manager
Added - SetVOFinputData Program Calling Manager
Added - SetVST Program Calling Manager
Added - ApplyAST_BLOCK1_ZONE2 Program Calling Manager
Added - ApplyAST_BLOCK1_ZONE1 Program Calling Manager
Added - SetMyVOF_Block1_Zone2_Wall_3_0_0_0_0_0_Win Program Calling Manager
Added - SetWindowOperation_Block1_Zone2_Wall_3_0_0_0_0_0_Win Program Calling Manager
Added - SetMyVOF_Block1_Zone2_Wall_4_0_0_0_0_0_Win Program Calling Manager
Added - SetWindowOperation_Block1_Zone2_Wall_4_0_0_0_0_0_Win Program Calling Manager
Added - SetMyVOF_Block1_Zone2_Wall_5_0_0_0_0_0_Win Program Calling Manager
Added - SetWindowOperation_Block1_Zone2_Wall_5_0_0_0_0_0_Win Program Calling Manager
Added - SetMyVOF_Block1_Zone1_Wall_2_0_0_0_0_0_Win Program Calling Manager
Added - SetWindowOperation_Block1_Zone1_Wall_2_0_0_0_0_0_Win Program Calling Manager
Added - SetMyVOF_Block1_Zone1_Wall_3_0_0_0_0_0_Win Program Calling Manager
Added - SetWindowOperation_Block1_Zone1_Wall_3_0_0_0_0_0_Win Program Calling Manager
Added - SetMyVOF_Block1_Zone1_Wall_5_0_0_0_0_0_Win Program Calling Manager
Added - SetWindowOperation_Block1_Zone1_Wall_5_0_0_0_0_0_Win Program Calling Manager
Added - Comfort Temperature Reporting FrequencyHourly Output:Variable data
Added - Adaptive Cooling Setpoint Temperature Reporting FrequencyHourly Output:Variable␣
↪data
Added - Adaptive Heating Setpoint Temperature Reporting FrequencyHourly Output:Variable␣
↪data
Added - Adaptive Cooling Setpoint Temperature_No Tolerance Reporting FrequencyHourly␣
↪Output:Variable data
```

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```
Added - Adaptive Heating Setpoint Temperature_No Tolerance Reporting FrequencyHourly␣
↪Output:Variable data
Added - Ventilation Setpoint Temperature Reporting FrequencyHourly Output:Variable data
Added - Minimum Outdoor Temperature for ventilation Reporting FrequencyHourly Output:
↪Variable data
Added - Minimum Outdoor Temperature Difference for ventilation Reporting FrequencyHourly␣
↪Output:Variable data
Added - Maximum Outdoor Temperature Difference for ventilation Reporting FrequencyHourly␣
↪Output:Variable data
Added - Multiplier for Ventilation Opening Factor Reporting FrequencyHourly Output:
↪Variable data
Added - Comfortable Hours_No Applicability_BLOCK1_ZONE2 Reporting FrequencyHourly Output:
↪Variable data
Added - Comfortable Hours_No Applicability_BLOCK1_ZONE1 Reporting FrequencyHourly Output:
↪Variable data
Added - Comfortable Hours_Applicability_BLOCK1_ZONE2 Reporting FrequencyHourly Output:
↪Variable data
Added - Comfortable Hours_Applicability_BLOCK1_ZONE1 Reporting FrequencyHourly Output:
↪Variable data
Added - Discomfortable Applicable Hot Hours_BLOCK1_ZONE2 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Applicable Hot Hours_BLOCK1_ZONE1 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Applicable Cold Hours_BLOCK1_ZONE2 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Applicable Cold Hours_BLOCK1_ZONE1 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE2 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE1 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE2 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE1 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Zone Floor Area_BLOCK1_ZONE2 Reporting FrequencyHourly Output:Variable data
Added - Zone Floor Area_BLOCK1_ZONE1 Reporting FrequencyHourly Output:Variable data
Added - Zone Air Volume_BLOCK1_ZONE2 Reporting FrequencyHourly Output:Variable data
Added - Zone Air Volume_BLOCK1_ZONE1 Reporting FrequencyHourly Output:Variable data
Added - Ventilation Hours_BLOCK1_ZONE2 Reporting FrequencyHourly Output:Variable data
Added - Ventilation Hours_BLOCK1_ZONE1 Reporting FrequencyHourly Output:Variable data
Added - Zone Operative Temperature Reporting FrequencyHourly Output:Variable data
Added - Zone Thermal Comfort CEN 15251 Adaptive Model Running Average Outdoor Air␣
↪Temperature Reporting FrequencyHourly Output:Variable data
Added - Zone Thermal Comfort ASHRAE 55 Adaptive Model Running Average Outdoor Air␣
↪Temperature Reporting FrequencyHourly Output:Variable data
Added - Cooling Coil Total Cooling Rate Reporting FrequencyHourly Output:Variable data
Added - Heating Coil Heating Rate Reporting FrequencyHourly Output:Variable data
Added - Facility Total HVAC Electric Demand Power Reporting FrequencyHourly Output:
↪Variable data
Added - Facility Total HVAC Electricity Demand Rate Reporting FrequencyHourly Output:
↪Variable data
```

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```
Added - AFN Surface Venting Window or Door Opening Factor Reporting FrequencyHourly␣
↪Output:Variable data
Added - AFN Zone Infiltration Air Change Rate Reporting FrequencyHourly Output:Variable␣
↪data
Added - AFN Zone Infiltration Volume Reporting FrequencyHourly Output:Variable data
Added - AFN Zone Ventilation Air Change Rate Reporting FrequencyHourly Output:Variable␣
↪data
Added - AFN Zone Ventilation Volume Reporting FrequencyHourly Output:Variable data
Added - Site Outdoor Air Drybulb Temperature Reporting FrequencyHourly Output:Variable␣
↪data
Added - Site Wind Speed Reporting FrequencyHourly Output:Variable data
Added - Site Outdoor Air Relative Humidity Reporting FrequencyHourly Output:Variable data
Added - AHST_Sch_BLOCK1_ZONE2 Reporting FrequencyHourly Output:Variable data
Added - ACST_Sch_BLOCK1_ZONE2 Reporting FrequencyHourly Output:Variable data
Added - AHST_Sch_BLOCK1_ZONE1 Reporting FrequencyHourly Output:Variable data
Added - ACST_Sch_BLOCK1_ZONE1 Reporting FrequencyHourly Output:Variable data
Added - VRF Heat Pump Cooling Electricity Energy Reporting FrequencyHourly Output:
↪Variable data
Added - VRF Heat Pump Heating Electricity Energy Reporting FrequencyHourly Output:
↪Variable data
Added - BLOCK1_ZONE2 VRF Indoor Unit DX Cooling Coil Reporting FrequencyHourly Output:
↪Variable data
Added - BLOCK1_ZONE2 VRF Indoor Unit DX Heating Coil Reporting Frequency Hourly Output:
↪Variable data
Added - BLOCK1_ZONE1 VRF Indoor Unit DX Cooling Coil Reporting FrequencyHourly Output:
↪Variable data
Added - BLOCK1_ZONE1 VRF Indoor Unit DX Heating Coil Reporting Frequency Hourly Output:
↪Variable data
Added - Comfort Temperature Reporting FrequencyRunperiod Output:Variable data
Added - Adaptive Cooling Setpoint Temperature Reporting FrequencyRunperiod Output:
↪Variable data
Added - Adaptive Heating Setpoint Temperature Reporting FrequencyRunperiod Output:
↪Variable data
Added - Adaptive Cooling Setpoint Temperature_No Tolerance Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Adaptive Heating Setpoint Temperature_No Tolerance Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Ventilation Setpoint Temperature Reporting FrequencyRunperiod Output:Variable␣
↪data
Added - Minimum Outdoor Temperature for ventilation Reporting FrequencyRunperiod Output:
↪Variable data
Added - Minimum Outdoor Temperature Difference for ventilation Reporting␣
↪FrequencyRunperiod Output:Variable data
Added - Maximum Outdoor Temperature Difference for ventilation Reporting␣
↪FrequencyRunperiod Output:Variable data
Added - Multiplier for Ventilation Opening Factor Reporting FrequencyRunperiod Output:
↪Variable data
Added - Comfortable Hours_No Applicability_BLOCK1_ZONE2 Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Comfortable Hours_No Applicability_BLOCK1_ZONE1 Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Comfortable Hours_Applicability_BLOCK1_ZONE2 Reporting FrequencyRunperiod Output:
```

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```
↪Variable data
Added - Comfortable Hours_Applicability_BLOCK1_ZONE1 Reporting FrequencyRunperiod Output:
↪Variable data
Added - Discomfortable Applicable Hot Hours_BLOCK1_ZONE2 Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Discomfortable Applicable Hot Hours_BLOCK1_ZONE1 Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Discomfortable Applicable Cold Hours_BLOCK1_ZONE2 Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Discomfortable Applicable Cold Hours_BLOCK1_ZONE1 Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE2 Reporting␣
↪FrequencyRunperiod Output:Variable data
Added - Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE1 Reporting␣
↪FrequencyRunperiod Output:Variable data
Added - Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE2 Reporting␣
↪FrequencyRunperiod Output:Variable data
Added - Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE1 Reporting␣
↪FrequencyRunperiod Output:Variable data
Added - Zone Floor Area_BLOCK1_ZONE2 Reporting FrequencyRunperiod Output:Variable data
Added - Zone Floor Area_BLOCK1_ZONE1 Reporting FrequencyRunperiod Output:Variable data
Added - Zone Air Volume_BLOCK1_ZONE2 Reporting FrequencyRunperiod Output:Variable data
Added - Zone Air Volume_BLOCK1_ZONE1 Reporting FrequencyRunperiod Output:Variable data
Added - Ventilation Hours_BLOCK1_ZONE2 Reporting FrequencyRunperiod Output:Variable data
Added - Ventilation Hours_BLOCK1_ZONE1 Reporting FrequencyRunperiod Output:Variable data
Added - Zone Operative Temperature Reporting FrequencyRunperiod Output:Variable data
Added - Zone Thermal Comfort CEN 15251 Adaptive Model Running Average Outdoor Air␣
↪Temperature Reporting FrequencyRunperiod Output:Variable data
Added - Zone Thermal Comfort ASHRAE 55 Adaptive Model Running Average Outdoor Air␣
↪Temperature Reporting FrequencyRunperiod Output:Variable data
Added - Cooling Coil Total Cooling Rate Reporting FrequencyRunperiod Output:Variable data
Added - Heating Coil Heating Rate Reporting FrequencyRunperiod Output:Variable data
Added - Facility Total HVAC Electric Demand Power Reporting FrequencyRunperiod Output:
↪Variable data
Added - Facility Total HVAC Electricity Demand Rate Reporting FrequencyRunperiod Output:
↪Variable data
Added - AFN Surface Venting Window or Door Opening Factor Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - AFN Zone Infiltration Air Change Rate Reporting FrequencyRunperiod Output:
↪Variable data
Added - AFN Zone Infiltration Volume Reporting FrequencyRunperiod Output:Variable data
Added - AFN Zone Ventilation Air Change Rate Reporting FrequencyRunperiod Output:
↪Variable data
Added - AFN Zone Ventilation Volume Reporting FrequencyRunperiod Output:Variable data
Added - Site Outdoor Air Drybulb Temperature Reporting FrequencyRunperiod Output:
↪Variable data
Added - Site Wind Speed Reporting FrequencyRunperiod Output:Variable data
Added - Site Outdoor Air Relative Humidity Reporting FrequencyRunperiod Output:Variable␣
↪data
Added - AHST_Sch_BLOCK1_ZONE2 Reporting FrequencyRunperiod Output:Variable data
Added - ACST_Sch_BLOCK1_ZONE2 Reporting FrequencyRunperiod Output:Variable data
Added - AHST_Sch_BLOCK1_ZONE1 Reporting FrequencyRunperiod Output:Variable data
```

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```
Added - ACST_Sch_BLOCK1_ZONE1 Reporting FrequencyRunperiod Output:Variable data
Added - VRF Heat Pump Cooling Electricity Energy Reporting FrequencyRunperiod Output:
↪Variable data
Added - VRF Heat Pump Heating Electricity Energy Reporting FrequencyRunperiod Output:
↪Variable data
Added - BLOCK1_ZONE2 VRF Indoor Unit DX Cooling Coil Reporting FrequencyRunperiod Output:
↪Variable data
Added - BLOCK1_ZONE2 VRF Indoor Unit DX Heating Coil Reporting Frequency Runperiod␣
↪Output:Variable data
Added - BLOCK1_ZONE1 VRF Indoor Unit DX Cooling Coil Reporting FrequencyRunperiod Output:
↪Variable data
Added - BLOCK1_ZONE1 VRF Indoor Unit DX Heating Coil Reporting Frequency Runperiod␣
↪Output:Variable data
IDF has been saved
Ending with file:
TestModel

=======================END OF GENERIC IDF FILE GENERATION PROCESS=======================

The following IDFs will not work, and therefore these will be deleted:
None

=======================START OF OUTPUT IDF FILES GENERATION␣
↪PROCESS=======================

The list of output IDFs is going to be:
TestModel[CS_INT EN16798[CA_1[CM_0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_1[CM_1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_1[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_1[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
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TestModel[CS_AUS DeDear[CA_90[CM_0.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
And the total number of output IDFs is going to be 36
Generating the following output IDF files:
TestModel[CS_INT EN16798[CA_1[CM_0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_1[CM_1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_1[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_1[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf

=======================END OF OUTPUT IDF FILES GENERATION PROCESS=========================
```

[8]:
```
<accim.sim.accis.addAccis at 0x202ce772ca0>
```

Let's see what files we do have now in the folder:

[9]:
```
os.listdir()
```

[9]:
```
['.ipynb_checkpoints',
 'TestModel.idf',
 'TestModel[CS_AUS DeDear[CA_80[CM_0.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_80[CM_0.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_80[CM_0.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_80[CM_0.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_80[CM_0.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_80[CM_1.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_80[CM_1.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_80[CM_1.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_80[CM_1.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_80[CM_1.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_80[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_80[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_90[CM_0.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_90[CM_0.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_90[CM_0.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_90[CM_0.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_90[CM_0.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_90[CM_1.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_90[CM_1.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_90[CM_1.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_90[CM_1.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_90[CM_1.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_90[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_AUS DeDear[CA_90[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_INT EN16798[CA_1[CM_0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_INT EN16798[CA_1[CM_1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_INT EN16798[CA_1[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_INT EN16798[CA_1[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_INT EN16798[CA_2[CM_0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_INT EN16798[CA_2[CM_1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_INT EN16798[CA_2[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_INT EN16798[CA_2[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_INT EN16798[CA_3[CM_0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_INT EN16798[CA_3[CM_1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_INT EN16798[CA_3[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'TestModel[CS_INT EN16798[CA_3[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf',
 'using_addAccis.ipynb',
 '__init__.py']
```

We can see there are new IDFs, as stated previously in the python console:

[10]:
```
output_idfs = [i for i in os.listdir() if not(any(i in j for j in input_idf)) and i.
↪endswith('.idf')]
print(*output_idfs, sep='\n')
```

```
TestModel[CS_AUS DeDear[CA_80[CM_0.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
```

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```
TestModel[CS_AUS DeDear[CA_80[CM_0.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_1[CM_0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_1[CM_1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_1[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_1[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
```

Now, these are ready for simulation with any EPW file, although it is recommended to have previously renamed them with the class rename_epw_files().

Let's remove the new output IDFs for clarity purposes:

[11]:
```
for i in os.listdir():
    if i.endswith('.idf') and input_idf[0] not in i:
        os.remove(i)
```

8.2 2. Other uses

8.2.1 2.1 Storing the `addAccis()` class and inspecting the output IDFs

Addittionally to just run `addAccis()` (i.e. instantiate the class), the user can also store the instance and inspect some variables. So let's store the instance in the variable `add_accis_instance` and then we'll take a look what's inside:

[12]:
```
from accim.sim import accis
add_accis_instance = accis.addAccis(
    ScriptType='vrf_mm',
    SupplyAirTempInputMethod='temperature difference',
    Output_keep_existing=False,
    Output_type='standard',
    Output_freqs=['hourly', 'runperiod'],
    Output_gen_dataframe=False,
    EnergyPlus_version='23.1',
    TempCtrl='temperature',
    ComfStand=[1, 14],
    CAT=[1, 2, 3, 80, 90],
    ComfMod=[0, 0.1, 0.2, 0.3, 0.4, 0.5, 1, 1.1, 1.2, 1.3, 1.4, 1.5, 2, 3],
    SetpointAcc=100,
    CoolSeasonStart='01/11',
    CoolSeasonEnd='01/03',
    HVACmode=[2],
    VentCtrl=[2],
    MaxTempDiffVOF=20,
    MinTempDiffVOF=1,
    MultiplierVOF=0.2,
    VSToffset=[0],
    MinOToffset=[50],
    MaxWindSpeed=[50],
    ASTtol_steps=0.1,
    ASTtol_start=0.1,
    ASTtol_end_input=0.1,
    confirmGen=True
)
```

```
------------------------------------------------------------
Adaptive-Comfort-Control-Implemented Model (ACCIM) v0.7.0
------------------------------------------------------------

This tool allows to apply adaptive setpoint temperatures.
For further information, please read the documentation:
https://accim.readthedocs.io/en/master/
For a visual understanding of the tool, please visit the following jupyter notebooks:
-    Using addAccis() to apply adaptive setpoint temperatures
https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_
↪notebooks/addAccis/using_addAccis.ipynb
-    Using rename_epw_files() to rename the EPWs for proper data analysis after␣
↪simulation
https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_
↪notebooks/rename_epw_files/using_rename_epw_files.ipynb
```

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```
-    Using runEp() to directly run simulations with EnergyPlus
https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_
↪notebooks/runEp/using_runEp.ipynb
-    Using the class Table() for data analysis
https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_
↪notebooks/Table/using_Table.ipynb
-    Full example
https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_
↪notebooks/Table/using_Table.ipynb

Starting with the process.
Basic input data:
ScriptType is: vrf_mm
Supply Air Temperature Input Method is: temperature difference
Output type is: standard
Output frequencies are:
['hourly', 'runperiod']
EnergyPlus version is: 23.1
Temperature Control method is: temperature

======================START OF GENERIC IDF FILE GENERATION␣
↪PROCESS======================

Starting with file:
TestModel
IDD location is: C:\EnergyPlusV23-1-0\Energy+.idd
The occupied zones in the model TestModel are:
BLOCK1:ZONE2
BLOCK1:ZONE1
The windows and doors in the model TestModel are:
Block1_Zone2_Wall_3_0_0_0_0_0_Win
Block1_Zone2_Wall_4_0_0_0_0_0_Win
Block1_Zone2_Wall_5_0_0_0_0_0_Win
Block1_Zone1_Wall_2_0_0_0_0_0_Win
Block1_Zone1_Wall_3_0_0_0_0_0_Win
Block1_Zone1_Wall_5_0_0_0_0_0_Win
The zones in the model TestModel are:
BLOCK1_ZONE2
BLOCK1_ZONE1
The people objects in the model have been amended.
BLOCK1:ZONE2 Thermostat has been added
BLOCK1:ZONE1 Thermostat has been added
On Schedule already was in the model
TypOperativeTempControlSch Schedule already was in the model
All ZoneHVAC:IdealLoadsAirSystem Heating and Cooling availability schedules has been set␣
↪to on
On 24/7 Schedule already was in the model
Control type schedule: Always 4 Schedule has been added
Relative humidity setpoint schedule: Always 50.00 Schedule has been added
Heating Fanger comfort setpoint: Always -0.5 Schedule has been added
Cooling Fanger comfort setpoint: Always  0.1 Schedule has been added
Zone CO2 setpoint: Always 900ppm Schedule has been added
```

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```
Min CO2 concentration: Always 600ppm Schedule has been added
Generic contaminant setpoint: Always 0.5ppm Schedule has been added
Air distribution effectiveness (always 1) Schedule has been added
VRF Heating Cooling (Northern Hemisphere) Schedule has been added
DefaultFanEffRatioCurve Curve:Cubic Object has been added
VRFTUCoolCapFT Curve:Cubic Object has been added
VRFTUHeatCapFT Curve:Cubic Object has been added
VRFCoolCapFTBoundary Curve:Cubic Object has been added
VRFCoolEIRFTBoundary Curve:Cubic Object has been added
CoolingEIRLowPLR Curve:Cubic Object has been added
VRFHeatCapFTBoundary Curve:Cubic Object has been added
VRFHeatEIRFTBoundary Curve:Cubic Object has been added
HeatingEIRLowPLR Curve:Cubic Object has been added
DefaultFanPowerRatioCurve Curve:Exponent Object has been added
DXHtgCoilDefrostEIRFT Curve:Biquadratic Object has been added
VRFCoolCapFT Curve:Biquadratic Object has been added
VRFCoolCapFTHi Curve:Biquadratic Object has been added
VRFCoolEIRFT Curve:Biquadratic Object has been added
VRFCoolEIRFTHi Curve:Biquadratic Object has been added
VRFHeatCapFT Curve:Biquadratic Object has been added
VRFHeatCapFTHi Curve:Biquadratic Object has been added
VRFHeatEIRFT Curve:Biquadratic Object has been added
VRFHeatEIRFTHi Curve:Biquadratic Object has been added
CoolingLengthCorrectionFactor Curve:Biquadratic Object has been added
VRF Piping Correction Factor for Length in Heating Mode Curve:Biquadratic Object has␣
↪been added
VRF Heat Recovery Cooling Capacity Modifier Curve:Biquadratic Object has been added
VRF Heat Recovery Cooling Energy Modifier Curve:Biquadratic Object has been added
VRF Heat Recovery Heating Capacity Modifier Curve:Biquadratic Object has been added
VRF Heat Recovery Heating Energy Modifier Curve:Biquadratic Object has been added
VRFACCoolCapFFF Curve:Quadratic Object has been added
CoolingEIRHiPLR Curve:Quadratic Object has been added
VRFCPLFFPLR Curve:Quadratic Object has been added
HeatingEIRHiPLR Curve:Quadratic Object has been added
CoolingCombRatio Curve:Linear Object has been added
HeatingCombRatio Curve:Linear Object has been added
VRF Outdoor Unit_BLOCK1:ZONE2 AirConditioner:VariableRefrigerantFlow Object has been␣
↪added
VRF Outdoor Unit_BLOCK1:ZONE1 AirConditioner:VariableRefrigerantFlow Object has been␣
↪added
VRF Outdoor Unit_BLOCK1:ZONE2 Outdoor Air Node Object has been added
VRF Outdoor Unit_BLOCK1:ZONE2 Zone List Object has been added
VRF Outdoor Unit_BLOCK1:ZONE1 Outdoor Air Node Object has been added
VRF Outdoor Unit_BLOCK1:ZONE1 Zone List Object has been added
BLOCK1:ZONE2 Sizing:Zone Object has been added
BLOCK1:ZONE1 Sizing:Zone Object has been added
BLOCK1:ZONE2 Design Specification Outdoor Air Object has been added
BLOCK1:ZONE1 Design Specification Outdoor Air Object has been added
BLOCK1:ZONE2 Design Specification Zone Air Distribution Object has been added
BLOCK1:ZONE1 Design Specification Zone Air Distribution Object has been added
BLOCK1:ZONE2 Nodelist Objects has been added
BLOCK1:ZONE1 Nodelist Objects has been added
```

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```
BLOCK1:ZONE2 ZoneHVAC:EquipmentConnections Objects has been added
BLOCK1:ZONE1 ZoneHVAC:EquipmentConnections Objects has been added
BLOCK1:ZONE2 ZoneHVAC:EquipmentList Objects has been added
BLOCK1:ZONE1 ZoneHVAC:EquipmentList Objects has been added
BLOCK1:ZONE2 ZoneHVAC:TerminalUnit:VariableRefrigerantFlow Object has been added
BLOCK1:ZONE1 ZoneHVAC:TerminalUnit:VariableRefrigerantFlow Object has been added
BLOCK1:ZONE2 Coil:Cooling:DX:VariableRefrigerantFlow Object has been added
BLOCK1:ZONE1 Coil:Cooling:DX:VariableRefrigerantFlow Object has been added
BLOCK1:ZONE2 Coil:Heating:DX:VariableRefrigerantFlow Object has been added
BLOCK1:ZONE1 Coil:Heating:DX:VariableRefrigerantFlow Object has been added
BLOCK1:ZONE2 Fan:ConstantVolume Object has been added
BLOCK1:ZONE1 Fan:ConstantVolume Object has been added
Vent_SP_temp Schedule has been added
AHST_Sch_BLOCK1_ZONE2 Schedule has been added
ACST_Sch_BLOCK1_ZONE2 Schedule has been added
AHST_Sch_BLOCK1_ZONE1 Schedule has been added
ACST_Sch_BLOCK1_ZONE1 Schedule has been added
Added - SetComfTemp Program
Added - CountHours_BLOCK1_ZONE2 Program
Added - CountHours_BLOCK1_ZONE1 Program
Added - SetAppLimits Program
Added - ApplyCAT Program
Added - SetAST Program
Added - SetASTnoTol Program
Added - CountHoursNoApp_BLOCK1_ZONE2 Program
Added - SetGeoVarBLOCK1_ZONE2 Program
Added - CountHoursNoApp_BLOCK1_ZONE1 Program
Added - SetGeoVarBLOCK1_ZONE1 Program
Added - SetInputData Program
Added - SetVOFinputData Program
Added - SetVST Program
Added - ApplyAST_BLOCK1_ZONE2 Program
Added - ApplyAST_BLOCK1_ZONE1 Program
Added - SetMyVOF_Block1_Zone2_Wall_3_0_0_0_0_0_Win Program
Added - SetWindowOperation_Block1_Zone2_Wall_3_0_0_0_0_0_Win Program
Added - SetMyVOF_Block1_Zone2_Wall_4_0_0_0_0_0_Win Program
Added - SetWindowOperation_Block1_Zone2_Wall_4_0_0_0_0_0_Win Program
Added - SetMyVOF_Block1_Zone2_Wall_5_0_0_0_0_0_Win Program
Added - SetWindowOperation_Block1_Zone2_Wall_5_0_0_0_0_0_Win Program
Added - SetMyVOF_Block1_Zone1_Wall_2_0_0_0_0_0_Win Program
Added - SetWindowOperation_Block1_Zone1_Wall_2_0_0_0_0_0_Win Program
Added - SetMyVOF_Block1_Zone1_Wall_3_0_0_0_0_0_Win Program
Added - SetWindowOperation_Block1_Zone1_Wall_3_0_0_0_0_0_Win Program
Added - SetMyVOF_Block1_Zone1_Wall_5_0_0_0_0_0_Win Program
Added - SetWindowOperation_Block1_Zone1_Wall_5_0_0_0_0_0_Win Program
Added - Comfort Temperature Output Variable
Added - Adaptive Cooling Setpoint Temperature Output Variable
Added - Adaptive Heating Setpoint Temperature Output Variable
Added - Adaptive Cooling Setpoint Temperature_No Tolerance Output Variable
Added - Adaptive Heating Setpoint Temperature_No Tolerance Output Variable
Added - Ventilation Setpoint Temperature Output Variable
Added - Minimum Outdoor Temperature for ventilation Output Variable
```

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```
Added - Minimum Outdoor Temperature Difference for ventilation Output Variable
Added - Maximum Outdoor Temperature Difference for ventilation Output Variable
Added - Multiplier for Ventilation Opening Factor Output Variable
Added - Comfortable Hours_No Applicability_BLOCK1_ZONE2 Output Variable
Added - Comfortable Hours_No Applicability_BLOCK1_ZONE1 Output Variable
Added - Comfortable Hours_Applicability_BLOCK1_ZONE2 Output Variable
Added - Comfortable Hours_Applicability_BLOCK1_ZONE1 Output Variable
Added - Discomfortable Applicable Hot Hours_BLOCK1_ZONE2 Output Variable
Added - Discomfortable Applicable Hot Hours_BLOCK1_ZONE1 Output Variable
Added - Discomfortable Applicable Cold Hours_BLOCK1_ZONE2 Output Variable
Added - Discomfortable Applicable Cold Hours_BLOCK1_ZONE1 Output Variable
Added - Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE2 Output Variable
Added - Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE1 Output Variable
Added - Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE2 Output Variable
Added - Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE1 Output Variable
Added - Zone Floor Area_BLOCK1_ZONE2 Output Variable
Added - Zone Floor Area_BLOCK1_ZONE1 Output Variable
Added - Zone Air Volume_BLOCK1_ZONE2 Output Variable
Added - Zone Air Volume_BLOCK1_ZONE1 Output Variable
Added - Ventilation Hours_BLOCK1_ZONE2 Output Variable
Added - Ventilation Hours_BLOCK1_ZONE1 Output Variable
Global variables objects have been added
Internal variables objects have been added
Added - RMOT Sensor
Added - PMOT Sensor
Added - BLOCK1_ZONE2_OpT Sensor
Added - BLOCK1_ZONE2_WindSpeed Sensor
Added - BLOCK1_ZONE2_OutT Sensor
Added - BLOCK1_ZONE1_OpT Sensor
Added - BLOCK1_ZONE1_WindSpeed Sensor
Added - BLOCK1_ZONE1_OutT Sensor
Added - Block1_Zone2_Wall_3_0_0_0_0_0_Win_OpT Sensor
Added - Block1_Zone2_Wall_3_0_0_0_0_0_Win_WindSpeed Sensor
Added - Block1_Zone2_Wall_3_0_0_0_0_0_Win_OutT Sensor
Added - Block1_Zone2_Wall_4_0_0_0_0_0_Win_OpT Sensor
Added - Block1_Zone2_Wall_4_0_0_0_0_0_Win_WindSpeed Sensor
Added - Block1_Zone2_Wall_4_0_0_0_0_0_Win_OutT Sensor
Added - Block1_Zone2_Wall_5_0_0_0_0_0_Win_OpT Sensor
Added - Block1_Zone2_Wall_5_0_0_0_0_0_Win_WindSpeed Sensor
Added - Block1_Zone2_Wall_5_0_0_0_0_0_Win_OutT Sensor
Added - Block1_Zone1_Wall_2_0_0_0_0_0_Win_OpT Sensor
Added - Block1_Zone1_Wall_2_0_0_0_0_0_Win_WindSpeed Sensor
Added - Block1_Zone1_Wall_2_0_0_0_0_0_Win_OutT Sensor
Added - Block1_Zone1_Wall_3_0_0_0_0_0_Win_OpT Sensor
Added - Block1_Zone1_Wall_3_0_0_0_0_0_Win_WindSpeed Sensor
Added - Block1_Zone1_Wall_3_0_0_0_0_0_Win_OutT Sensor
Added - Block1_Zone1_Wall_5_0_0_0_0_0_Win_OpT Sensor
Added - Block1_Zone1_Wall_5_0_0_0_0_0_Win_WindSpeed Sensor
Added - Block1_Zone1_Wall_5_0_0_0_0_0_Win_OutT Sensor
Added - OutT Sensor
Added - AHST_Act_BLOCK1_ZONE2 Actuator
Added - ACST_Act_BLOCK1_ZONE2 Actuator
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```
Added - AHST_Act_BLOCK1_ZONE1 Actuator
Added - ACST_Act_BLOCK1_ZONE1 Actuator
Added - Block1_Zone2_Wall_3_0_0_0_0_0_Win_VentOpenFact Actuator
Added - Block1_Zone2_Wall_4_0_0_0_0_0_Win_VentOpenFact Actuator
Added - Block1_Zone2_Wall_5_0_0_0_0_0_Win_VentOpenFact Actuator
Added - Block1_Zone1_Wall_2_0_0_0_0_0_Win_VentOpenFact Actuator
Added - Block1_Zone1_Wall_3_0_0_0_0_0_Win_VentOpenFact Actuator
Added - Block1_Zone1_Wall_5_0_0_0_0_0_Win_VentOpenFact Actuator
Added - BLOCK1_ZONE2_CoolCoil Sensor
Added - BLOCK1_ZONE2_HeatCoil Sensor
Added - BLOCK1_ZONE1_CoolCoil Sensor
Added - BLOCK1_ZONE1_HeatCoil Sensor
Added - Block1_Zone2_Wall_3_0_0_0_0_0_Win_CoolCoil Sensor
Added - Block1_Zone2_Wall_3_0_0_0_0_0_Win_HeatCoil Sensor
Added - Block1_Zone2_Wall_4_0_0_0_0_0_Win_CoolCoil Sensor
Added - Block1_Zone2_Wall_4_0_0_0_0_0_Win_HeatCoil Sensor
Added - Block1_Zone2_Wall_5_0_0_0_0_0_Win_CoolCoil Sensor
Added - Block1_Zone2_Wall_5_0_0_0_0_0_Win_HeatCoil Sensor
Added - Block1_Zone1_Wall_2_0_0_0_0_0_Win_CoolCoil Sensor
Added - Block1_Zone1_Wall_2_0_0_0_0_0_Win_HeatCoil Sensor
Added - Block1_Zone1_Wall_3_0_0_0_0_0_Win_CoolCoil Sensor
Added - Block1_Zone1_Wall_3_0_0_0_0_0_Win_HeatCoil Sensor
Added - Block1_Zone1_Wall_5_0_0_0_0_0_Win_CoolCoil Sensor
Added - Block1_Zone1_Wall_5_0_0_0_0_0_Win_HeatCoil Sensor
Added - SetComfTemp Program Calling Manager
Added - CountHours_BLOCK1_ZONE2 Program Calling Manager
Added - CountHours_BLOCK1_ZONE1 Program Calling Manager
Added - SetAppLimits Program Calling Manager
Added - ApplyCAT Program Calling Manager
Added - SetAST Program Calling Manager
Added - SetASTnoTol Program Calling Manager
Added - CountHoursNoApp_BLOCK1_ZONE2 Program Calling Manager
Added - SetGeoVarBLOCK1_ZONE2 Program Calling Manager
Added - CountHoursNoApp_BLOCK1_ZONE1 Program Calling Manager
Added - SetGeoVarBLOCK1_ZONE1 Program Calling Manager
Added - SetInputData Program Calling Manager
Added - SetVOFinputData Program Calling Manager
Added - SetVST Program Calling Manager
Added - ApplyAST_BLOCK1_ZONE2 Program Calling Manager
Added - ApplyAST_BLOCK1_ZONE1 Program Calling Manager
Added - SetMyVOF_Block1_Zone2_Wall_3_0_0_0_0_0_Win Program Calling Manager
Added - SetWindowOperation_Block1_Zone2_Wall_3_0_0_0_0_0_Win Program Calling Manager
Added - SetMyVOF_Block1_Zone2_Wall_4_0_0_0_0_0_Win Program Calling Manager
Added - SetWindowOperation_Block1_Zone2_Wall_4_0_0_0_0_0_Win Program Calling Manager
Added - SetMyVOF_Block1_Zone2_Wall_5_0_0_0_0_0_Win Program Calling Manager
Added - SetWindowOperation_Block1_Zone2_Wall_5_0_0_0_0_0_Win Program Calling Manager
Added - SetMyVOF_Block1_Zone1_Wall_2_0_0_0_0_0_Win Program Calling Manager
Added - SetWindowOperation_Block1_Zone1_Wall_2_0_0_0_0_0_Win Program Calling Manager
Added - SetMyVOF_Block1_Zone1_Wall_3_0_0_0_0_0_Win Program Calling Manager
Added - SetWindowOperation_Block1_Zone1_Wall_3_0_0_0_0_0_Win Program Calling Manager
Added - SetMyVOF_Block1_Zone1_Wall_5_0_0_0_0_0_Win Program Calling Manager
Added - SetWindowOperation_Block1_Zone1_Wall_5_0_0_0_0_0_Win Program Calling Manager
```

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```
Added - Comfort Temperature Reporting FrequencyHourly Output:Variable data
Added - Adaptive Cooling Setpoint Temperature Reporting FrequencyHourly Output:Variable␣
↪data
Added - Adaptive Heating Setpoint Temperature Reporting FrequencyHourly Output:Variable␣
↪data
Added - Adaptive Cooling Setpoint Temperature_No Tolerance Reporting FrequencyHourly␣
↪Output:Variable data
Added - Adaptive Heating Setpoint Temperature_No Tolerance Reporting FrequencyHourly␣
↪Output:Variable data
Added - Ventilation Setpoint Temperature Reporting FrequencyHourly Output:Variable data
Added - Minimum Outdoor Temperature for ventilation Reporting FrequencyHourly Output:
↪Variable data
Added - Minimum Outdoor Temperature Difference for ventilation Reporting FrequencyHourly␣
↪Output:Variable data
Added - Maximum Outdoor Temperature Difference for ventilation Reporting FrequencyHourly␣
↪Output:Variable data
Added - Multiplier for Ventilation Opening Factor Reporting FrequencyHourly Output:
↪Variable data
Added - Comfortable Hours_No Applicability_BLOCK1_ZONE2 Reporting FrequencyHourly Output:
↪Variable data
Added - Comfortable Hours_No Applicability_BLOCK1_ZONE1 Reporting FrequencyHourly Output:
↪Variable data
Added - Comfortable Hours_Applicability_BLOCK1_ZONE2 Reporting FrequencyHourly Output:
↪Variable data
Added - Comfortable Hours_Applicability_BLOCK1_ZONE1 Reporting FrequencyHourly Output:
↪Variable data
Added - Discomfortable Applicable Hot Hours_BLOCK1_ZONE2 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Applicable Hot Hours_BLOCK1_ZONE1 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Applicable Cold Hours_BLOCK1_ZONE2 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Applicable Cold Hours_BLOCK1_ZONE1 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE2 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE1 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE2 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE1 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Zone Floor Area_BLOCK1_ZONE2 Reporting FrequencyHourly Output:Variable data
Added - Zone Floor Area_BLOCK1_ZONE1 Reporting FrequencyHourly Output:Variable data
Added - Zone Air Volume_BLOCK1_ZONE2 Reporting FrequencyHourly Output:Variable data
Added - Zone Air Volume_BLOCK1_ZONE1 Reporting FrequencyHourly Output:Variable data
Added - Ventilation Hours_BLOCK1_ZONE2 Reporting FrequencyHourly Output:Variable data
Added - Ventilation Hours_BLOCK1_ZONE1 Reporting FrequencyHourly Output:Variable data
Added - Zone Operative Temperature Reporting FrequencyHourly Output:Variable data
Added - Zone Thermal Comfort CEN 15251 Adaptive Model Running Average Outdoor Air␣
↪Temperature Reporting FrequencyHourly Output:Variable data
Added - Zone Thermal Comfort ASHRAE 55 Adaptive Model Running Average Outdoor Air␣
```

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```
↪Temperature Reporting FrequencyHourly Output:Variable data
Added - Cooling Coil Total Cooling Rate Reporting FrequencyHourly Output:Variable data
Added - Heating Coil Heating Rate Reporting FrequencyHourly Output:Variable data
Added - Facility Total HVAC Electric Demand Power Reporting FrequencyHourly Output:
↪Variable data
Added - Facility Total HVAC Electricity Demand Rate Reporting FrequencyHourly Output:
↪Variable data
Added - AFN Surface Venting Window or Door Opening Factor Reporting FrequencyHourly␣
↪Output:Variable data
Added - AFN Zone Infiltration Air Change Rate Reporting FrequencyHourly Output:Variable␣
↪data
Added - AFN Zone Infiltration Volume Reporting FrequencyHourly Output:Variable data
Added - AFN Zone Ventilation Air Change Rate Reporting FrequencyHourly Output:Variable␣
↪data
Added - AFN Zone Ventilation Volume Reporting FrequencyHourly Output:Variable data
Added - Site Outdoor Air Drybulb Temperature Reporting FrequencyHourly Output:Variable␣
↪data
Added - Site Wind Speed Reporting FrequencyHourly Output:Variable data
Added - Site Outdoor Air Relative Humidity Reporting FrequencyHourly Output:Variable data
Added - AHST_Sch_BLOCK1_ZONE2 Reporting FrequencyHourly Output:Variable data
Added - ACST_Sch_BLOCK1_ZONE2 Reporting FrequencyHourly Output:Variable data
Added - AHST_Sch_BLOCK1_ZONE1 Reporting FrequencyHourly Output:Variable data
Added - ACST_Sch_BLOCK1_ZONE1 Reporting FrequencyHourly Output:Variable data
Added - VRF Heat Pump Cooling Electricity Energy Reporting FrequencyHourly Output:
↪Variable data
Added - VRF Heat Pump Heating Electricity Energy Reporting FrequencyHourly Output:
↪Variable data
Added - BLOCK1_ZONE2 VRF Indoor Unit DX Cooling Coil Reporting FrequencyHourly Output:
↪Variable data
Added - BLOCK1_ZONE2 VRF Indoor Unit DX Heating Coil Reporting Frequency Hourly Output:
↪Variable data
Added - BLOCK1_ZONE1 VRF Indoor Unit DX Cooling Coil Reporting FrequencyHourly Output:
↪Variable data
Added - BLOCK1_ZONE1 VRF Indoor Unit DX Heating Coil Reporting Frequency Hourly Output:
↪Variable data
Added - Comfort Temperature Reporting FrequencyRunperiod Output:Variable data
Added - Adaptive Cooling Setpoint Temperature Reporting FrequencyRunperiod Output:
↪Variable data
Added - Adaptive Heating Setpoint Temperature Reporting FrequencyRunperiod Output:
↪Variable data
Added - Adaptive Cooling Setpoint Temperature_No Tolerance Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Adaptive Heating Setpoint Temperature_No Tolerance Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Ventilation Setpoint Temperature Reporting FrequencyRunperiod Output:Variable␣
↪data
Added - Minimum Outdoor Temperature for ventilation Reporting FrequencyRunperiod Output:
↪Variable data
Added - Minimum Outdoor Temperature Difference for ventilation Reporting␣
↪FrequencyRunperiod Output:Variable data
Added - Maximum Outdoor Temperature Difference for ventilation Reporting␣
↪FrequencyRunperiod Output:Variable data
```

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```
Added - Multiplier for Ventilation Opening Factor Reporting FrequencyRunperiod Output:
↪Variable data
Added - Comfortable Hours_No Applicability_BLOCK1_ZONE2 Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Comfortable Hours_No Applicability_BLOCK1_ZONE1 Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Comfortable Hours_Applicability_BLOCK1_ZONE2 Reporting FrequencyRunperiod Output:
↪Variable data
Added - Comfortable Hours_Applicability_BLOCK1_ZONE1 Reporting FrequencyRunperiod Output:
↪Variable data
Added - Discomfortable Applicable Hot Hours_BLOCK1_ZONE2 Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Discomfortable Applicable Hot Hours_BLOCK1_ZONE1 Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Discomfortable Applicable Cold Hours_BLOCK1_ZONE2 Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Discomfortable Applicable Cold Hours_BLOCK1_ZONE1 Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE2 Reporting␣
↪FrequencyRunperiod Output:Variable data
Added - Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE1 Reporting␣
↪FrequencyRunperiod Output:Variable data
Added - Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE2 Reporting␣
↪FrequencyRunperiod Output:Variable data
Added - Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE1 Reporting␣
↪FrequencyRunperiod Output:Variable data
Added - Zone Floor Area_BLOCK1_ZONE2 Reporting FrequencyRunperiod Output:Variable data
Added - Zone Floor Area_BLOCK1_ZONE1 Reporting FrequencyRunperiod Output:Variable data
Added - Zone Air Volume_BLOCK1_ZONE2 Reporting FrequencyRunperiod Output:Variable data
Added - Zone Air Volume_BLOCK1_ZONE1 Reporting FrequencyRunperiod Output:Variable data
Added - Ventilation Hours_BLOCK1_ZONE2 Reporting FrequencyRunperiod Output:Variable data
Added - Ventilation Hours_BLOCK1_ZONE1 Reporting FrequencyRunperiod Output:Variable data
Added - Zone Operative Temperature Reporting FrequencyRunperiod Output:Variable data
Added - Zone Thermal Comfort CEN 15251 Adaptive Model Running Average Outdoor Air␣
↪Temperature Reporting FrequencyRunperiod Output:Variable data
Added - Zone Thermal Comfort ASHRAE 55 Adaptive Model Running Average Outdoor Air␣
↪Temperature Reporting FrequencyRunperiod Output:Variable data
Added - Cooling Coil Total Cooling Rate Reporting FrequencyRunperiod Output:Variable data
Added - Heating Coil Heating Rate Reporting FrequencyRunperiod Output:Variable data
Added - Facility Total HVAC Electric Demand Power Reporting FrequencyRunperiod Output:
↪Variable data
Added - Facility Total HVAC Electricity Demand Rate Reporting FrequencyRunperiod Output:
↪Variable data
Added - AFN Surface Venting Window or Door Opening Factor Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - AFN Zone Infiltration Air Change Rate Reporting FrequencyRunperiod Output:
↪Variable data
Added - AFN Zone Infiltration Volume Reporting FrequencyRunperiod Output:Variable data
Added - AFN Zone Ventilation Air Change Rate Reporting FrequencyRunperiod Output:
↪Variable data
Added - AFN Zone Ventilation Volume Reporting FrequencyRunperiod Output:Variable data
Added - Site Outdoor Air Drybulb Temperature Reporting FrequencyRunperiod Output:
```

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```
↪Variable data
Added - Site Wind Speed Reporting FrequencyRunperiod Output:Variable data
Added - Site Outdoor Air Relative Humidity Reporting FrequencyRunperiod Output:Variable␣
↪data
Added - AHST_Sch_BLOCK1_ZONE2 Reporting FrequencyRunperiod Output:Variable data
Added - ACST_Sch_BLOCK1_ZONE2 Reporting FrequencyRunperiod Output:Variable data
Added - AHST_Sch_BLOCK1_ZONE1 Reporting FrequencyRunperiod Output:Variable data
Added - ACST_Sch_BLOCK1_ZONE1 Reporting FrequencyRunperiod Output:Variable data
Added - VRF Heat Pump Cooling Electricity Energy Reporting FrequencyRunperiod Output:
↪Variable data
Added - VRF Heat Pump Heating Electricity Energy Reporting FrequencyRunperiod Output:
↪Variable data
Added - BLOCK1_ZONE2 VRF Indoor Unit DX Cooling Coil Reporting FrequencyRunperiod Output:
↪Variable data
Added - BLOCK1_ZONE2 VRF Indoor Unit DX Heating Coil Reporting Frequency Runperiod␣
↪Output:Variable data
Added - BLOCK1_ZONE1 VRF Indoor Unit DX Cooling Coil Reporting FrequencyRunperiod Output:
↪Variable data
Added - BLOCK1_ZONE1 VRF Indoor Unit DX Heating Coil Reporting Frequency Runperiod␣
↪Output:Variable data
IDF has been saved
Ending with file:
TestModel

=======================END OF GENERIC IDF FILE GENERATION PROCESS=======================

The following IDFs will not work, and therefore these will be deleted:
None

=======================START OF OUTPUT IDF FILES GENERATION␣
↪PROCESS=======================

The list of output IDFs is going to be:
TestModel[CS_INT EN16798[CA_1[CM_0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_1[CM_1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_1[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_1[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
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```
TestModel[CS_AUS DeDear[CA_80[CM_1.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
And the total number of output IDFs is going to be 36
Generating the following output IDF files:
TestModel[CS_INT EN16798[CA_1[CM_0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_1[CM_1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_1[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_1[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
```

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```
TestModel[CS_AUS DeDear[CA_90[CM_1.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf

=======================END OF OUTPUT IDF FILES GENERATION PROCESS=======================
```

Now, let's take a look into the variables within the `addAccis()` instance `add_accis_instance`:

[13]:
```
[i for i in dir(add_accis_instance) if '__' not in i]
```

[13]:
```
['arguments',
 'input_idfs',
 'occupied_zones',
 'occupied_zones_original_name',
 'output_idfs',
 'windows_and_doors',
 'windows_and_doors_original_name']
```

For instance, we can take a look at the arguments we have requested when "addAccis" was called:

[14]:
```
add_accis_instance.arguments
```

[14]:
```
{'ScriptType': 'vrf_mm',
 'SupplyAirTempInputMethod': 'temperature difference',
 'Output_type': 'standard',
 'Output_freqs': ['hourly', 'runperiod'],
 'Output_keep_existing': False,
 'Output_gen_dataframe': False,
 'Output_take_dataframe': None,
 'EnergyPlus_version': '23.1',
 'TempCtrl': 'temperature',
 'ComfStand': [1, 14],
 'CAT': [1, 2, 3, 80, 90],
 'ComfMod': [0, 0.1, 0.2, 0.3, 0.4, 0.5, 1, 1.1, 1.2, 1.3, 1.4, 1.5, 2, 3],
 'SetpointAcc': 100,
 'CoolSeasonStart': '01/11',
 'CoolSeasonEnd': '01/03',
 'HVACmode': [2],
 'VentCtrl': [2],
 'MaxTempDiffVOF': 20,
 'MinTempDiffVOF': 1,
 'MultiplierVOF': 0.2,
 'VSToffset': [0],
 'MinOToffset': [50],
 'MaxWindSpeed': [50],
 'ASTtol_start': 0.1,
 'ASTtol_end_input': 0.1,
 'ASTtol_steps': 0.1,
 'NameSuffix': '',
 'verboseMode': True,
 'confirmGen': True}
```

Also, we can see the list of occupied zones and windows and doors in each model, considering the original names and

the new names needed by accim:

```
[15]: add_accis_instance.occupied_zones
```

```
[15]: {'TestModel': ['BLOCK1_ZONE2', 'BLOCK1_ZONE1']}
```

```
[16]: add_accis_instance.occupied_zones_original_name
```

```
[16]: {'TestModel': ['BLOCK1:ZONE2', 'BLOCK1:ZONE1']}
```

```
[17]: add_accis_instance.windows_and_doors
```

```
[17]: {'TestModel': ['Block1_Zone2_Wall_3_0_0_0_0_0_Win',
  'Block1_Zone2_Wall_4_0_0_0_0_0_Win',
  'Block1_Zone2_Wall_5_0_0_0_0_0_Win',
  'Block1_Zone1_Wall_2_0_0_0_0_0_Win',
  'Block1_Zone1_Wall_3_0_0_0_0_0_Win',
  'Block1_Zone1_Wall_5_0_0_0_0_0_Win']}
```

```
[18]: add_accis_instance.windows_and_doors_original_name
```

```
[18]: {'TestModel': ['Block1:Zone2_Wall_3_0_0_0_0_0_Win',
  'Block1:Zone2_Wall_4_0_0_0_0_0_Win',
  'Block1:Zone2_Wall_5_0_0_0_0_0_Win',
  'Block1:Zone1_Wall_2_0_0_0_0_0_Win',
  'Block1:Zone1_Wall_3_0_0_0_0_0_Win',
  'Block1:Zone1_Wall_5_0_0_0_0_0_Win']}
```

As you can see, these variables are dictionaries following the pattern: `{'input idf filename': [list]}`

Also, we can inspect both the input and output idf files using eppy. In both cases, the variables `input_idfs` and `output_idfs` contains a dictionary following the pattern `{'idf filename': eppy.modeleditor.IDF object}`. For instance, let's take a look at the `input_idfs` variable.

```
[19]: add_accis_instance.input_idfs
```

```
[19]: {'TestModel': <eppy.modeleditor.IDF at 0x202d52010d0>}
```

So let's read the eppy.modeleditor.IDF object of the idf TestModel. For instance, let's see which zones are in the IDF by reading it, and if these are the same as previously seen in `add_accis_instance.occupied_zones_original_name`:

```
[20]: testmodel = add_accis_instance.input_idfs['TestModel']
testmodel.idfobjects['ZONE']
```

```
[20]: [
Zone,
    Block1:Zone2,             !- Name
    0,                        !- Direction of Relative North
    0,                        !- X Origin
    0,                        !- Y Origin
    0,                        !- Z Origin
    1,                        !- Type
    1,                        !- Multiplier
    ,                         !- Ceiling Height
    126.7064,                 !- Volume
    36.2018,                  !- Floor Area
```

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```
    TARP,                   !- Zone Inside Convection Algorithm
    ,                       !- Zone Outside Convection Algorithm
    Yes;                    !- Part of Total Floor Area
,
Zone,
    Block1:Zone1,           !- Name
    0,                      !- Direction of Relative North
    0,                      !- X Origin
    0,                      !- Y Origin
    0,                      !- Z Origin
    1,                      !- Type
    1,                      !- Multiplier
    ,                       !- Ceiling Height
    105.3337,               !- Volume
    30.0953,                !- Floor Area
    TARP,                   !- Zone Inside Convection Algorithm
    ,                       !- Zone Outside Convection Algorithm
    Yes;                    !- Part of Total Floor Area
]
```

And we can see these are the same. Also, you can take a look at the variable `output_idfs`, which is another dictionary similar to `input_idfs` but with the output files.

[21]:
```
add_accis_instance.output_idfs
```

[21]:
```
{'TestModel[CS_INT EN16798[CA_1[CM_0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf':
↪<eppy.modeleditor.IDF at 0x202d7b1c550>,
 'TestModel[CS_INT EN16798[CA_1[CM_1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf':
↪<eppy.modeleditor.IDF at 0x202d7b1c550>,
 'TestModel[CS_INT EN16798[CA_1[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf':
↪<eppy.modeleditor.IDF at 0x202d7b1c550>,
 'TestModel[CS_INT EN16798[CA_1[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf':
↪<eppy.modeleditor.IDF at 0x202d7b1c550>,
 'TestModel[CS_INT EN16798[CA_2[CM_0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf':
↪<eppy.modeleditor.IDF at 0x202d7b1c550>,
 'TestModel[CS_INT EN16798[CA_2[CM_1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf':
↪<eppy.modeleditor.IDF at 0x202d7b1c550>,
 'TestModel[CS_INT EN16798[CA_2[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf':
↪<eppy.modeleditor.IDF at 0x202d7b1c550>,
 'TestModel[CS_INT EN16798[CA_2[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf':
↪<eppy.modeleditor.IDF at 0x202d7b1c550>,
 'TestModel[CS_INT EN16798[CA_3[CM_0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf':
↪<eppy.modeleditor.IDF at 0x202d7b1c550>,
 'TestModel[CS_INT EN16798[CA_3[CM_1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf':
↪<eppy.modeleditor.IDF at 0x202d7b1c550>,
 'TestModel[CS_INT EN16798[CA_3[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf':
↪<eppy.modeleditor.IDF at 0x202d7b1c550>,
 'TestModel[CS_INT EN16798[CA_3[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf':
↪<eppy.modeleditor.IDF at 0x202d7b1c550>,
 'TestModel[CS_AUS DeDear[CA_80[CM_0.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf':
↪ <eppy.modeleditor.IDF at 0x202d7b1c550>,
 'TestModel[CS_AUS DeDear[CA_80[CM_0.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf':
↪ <eppy.modeleditor.IDF at 0x202d7b1c550>,
```

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```
 'TestModel[CS_AUS DeDear[CA_80[CM_0.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf':
↪ <eppy.modeleditor.IDF at 0x202d7b1c550>,
 'TestModel[CS_AUS DeDear[CA_80[CM_0.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf':
↪ <eppy.modeleditor.IDF at 0x202d7b1c550>,
 'TestModel[CS_AUS DeDear[CA_80[CM_0.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf':
↪ <eppy.modeleditor.IDF at 0x202d7b1c550>,
 'TestModel[CS_AUS DeDear[CA_80[CM_1.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf':
↪ <eppy.modeleditor.IDF at 0x202d7b1c550>,
 'TestModel[CS_AUS DeDear[CA_80[CM_1.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf':
↪ <eppy.modeleditor.IDF at 0x202d7b1c550>,
 'TestModel[CS_AUS DeDear[CA_80[CM_1.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf':
↪ <eppy.modeleditor.IDF at 0x202d7b1c550>,
 'TestModel[CS_AUS DeDear[CA_80[CM_1.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf':
↪ <eppy.modeleditor.IDF at 0x202d7b1c550>,
 'TestModel[CS_AUS DeDear[CA_80[CM_1.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf':
↪ <eppy.modeleditor.IDF at 0x202d7b1c550>,
 'TestModel[CS_AUS DeDear[CA_80[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf':
↪<eppy.modeleditor.IDF at 0x202d7b1c550>,
 'TestModel[CS_AUS DeDear[CA_80[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf':
↪<eppy.modeleditor.IDF at 0x202d7b1c550>,
 'TestModel[CS_AUS DeDear[CA_90[CM_0.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf':
↪ <eppy.modeleditor.IDF at 0x202d7b1c550>,
 'TestModel[CS_AUS DeDear[CA_90[CM_0.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf':
↪ <eppy.modeleditor.IDF at 0x202d7b1c550>,
 'TestModel[CS_AUS DeDear[CA_90[CM_0.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf':
↪ <eppy.modeleditor.IDF at 0x202d7b1c550>,
 'TestModel[CS_AUS DeDear[CA_90[CM_0.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf':
↪ <eppy.modeleditor.IDF at 0x202d7b1c550>,
 'TestModel[CS_AUS DeDear[CA_90[CM_0.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf':
↪ <eppy.modeleditor.IDF at 0x202d7b1c550>,
 'TestModel[CS_AUS DeDear[CA_90[CM_1.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf':
↪ <eppy.modeleditor.IDF at 0x202d7b1c550>,
 'TestModel[CS_AUS DeDear[CA_90[CM_1.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf':
↪ <eppy.modeleditor.IDF at 0x202d7b1c550>,
 'TestModel[CS_AUS DeDear[CA_90[CM_1.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf':
↪ <eppy.modeleditor.IDF at 0x202d7b1c550>,
 'TestModel[CS_AUS DeDear[CA_90[CM_1.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf':
↪ <eppy.modeleditor.IDF at 0x202d7b1c550>,
 'TestModel[CS_AUS DeDear[CA_90[CM_1.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf':
↪ <eppy.modeleditor.IDF at 0x202d7b1c550>,
 'TestModel[CS_AUS DeDear[CA_90[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf':
↪<eppy.modeleditor.IDF at 0x202d7b1c550>,
 'TestModel[CS_AUS DeDear[CA_90[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf':
↪<eppy.modeleditor.IDF at 0x202d7b1c550>}
```

Let's read the last one. Let's see, for instance, the Schedule:Compact objects for the thermostats:

[22]:
```
ast_testmodel = add_accis_instance.output_idfs[
    'TestModel[CS_AUS DeDear[CA_90[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf'
]
ast_testmodel.idfobjects['ThermostatSetpoint:DualSetpoint']
```

[22]:
```
[
THERMOSTATSETPOINT:DUALSETPOINT,
    BLOCK1:ZONE2 Dual SP,     !- Name
    AHST_Sch_BLOCK1_ZONE2,    !- Heating Setpoint Temperature Schedule Name
    ACST_Sch_BLOCK1_ZONE2;    !- Cooling Setpoint Temperature Schedule Name
,
THERMOSTATSETPOINT:DUALSETPOINT,
    BLOCK1:ZONE1 Dual SP,     !- Name
    AHST_Sch_BLOCK1_ZONE1,    !- Heating Setpoint Temperature Schedule Name
    ACST_Sch_BLOCK1_ZONE1;    !- Cooling Setpoint Temperature Schedule Name
]
```

And now let's compare this with the input idf:

[23]:
```
testmodel.idfobjects['ThermostatSetpoint:DualSetpoint']
```

[23]:
```
[
ThermostatSetpoint:DualSetpoint,
    Dual Setpoint - Zone Block1:Zone2,    !- Name
    Block1:Zone2 Heating Setpoint Schedule,    !- Heating Setpoint Temperature Schedule␣
↪Name
    Block1:Zone2 Cooling SP Sch;    !- Cooling Setpoint Temperature Schedule Name
,
ThermostatSetpoint:DualSetpoint,
    Dual Setpoint - Zone Block1:Zone1,    !- Name
    Block1:Zone1 Heating Setpoint Schedule,    !- Heating Setpoint Temperature Schedule␣
↪Name
    Block1:Zone1 Cooling SP Sch;    !- Cooling Setpoint Temperature Schedule Name
]
```

Therefore, we can confirm the Schedule:Compact objects for output idf stored in variable `ast_testmodel` are AHST and ACST, and thus, adaptive setpoint temperatures have been applied. However, this is different in the original idf, stored in variable `testmodel`, in which setpoint temperatures are static.

For more information about the use of eppy, please refer to the documentation at https://eppy.readthedocs.io/en/latest/ or https://eppy.readthedocs.io/en/latest/Main_Tutorial.html

Let's delete all the output idf files so that we can re-run the notebook.

[24]:
```
for i in os.listdir():
    if i.endswith('.idf') and input_idf[0] not in i:
        os.remove(i)
```

8.2.2 2.2 Specifying the outputs in the IDF

8.2.2.1 2.2.1 Using `Output_type='custom'`

Imagine you need to perform a large number of simulations, therefore, using `Output_type='standard'` would result in a heavy dataset. Using `Output_type='simplified'` is not an option, since you need more outputs than just the operative temperature, heating coil heating rate and cooling coil total cooling rate. In that case, you can use `Output_type='custom'`. If you do so, accim will iterate through the existing reporting frequencies and will show you all the existing Output:Variable objects for that frequency, and then, you'll be asked the following: - firstly, you'll need to say if you want to remove some object or otherwise keep some and remove all others by entering "remove" or "keep" - secondly, you'll have to say all Output:Variable objects you want to remove or keep

So let's say we want to keep the following Output:Variable objects (you may not be aware of them, but in that case, you can see the existing objects in the list accim prints), which you'll need to enter separted by semicolon (;):

Zone Operative Temperature;Adaptive Cooling Setpoint Temperature_No Tolerance;Adaptive Heating Setpoint Temperature_No Tolerance

Also, in this case, we are going to store the `addAccis()` instance in the variable `add_accis_instance` (similar to previous section 2.1), so that we can inspect it later.

First of all, let's see the idfs we do have in this path:

[25]:
```
from os import listdir
input_idfs = [i for i in listdir() if i.endswith('.idf')]
input_idfs
```

[25]:
```
['TestModel.idf']
```

Now, we can go for it:

[26]:
```
from accim.sim import accis
add_accis_instance = accis.addAccis(
    ScriptType='vrf_mm',
    SupplyAirTempInputMethod='temperature difference',
    Output_keep_existing=False,
    Output_type='custom',
    Output_freqs=['hourly', 'runperiod'],
    Output_gen_dataframe=False,
    EnergyPlus_version='23.1',
    TempCtrl='temperature',
    ComfStand=[1, 14],
    CAT=[1, 2, 3, 80, 90],
    ComfMod=[0, 0.1, 0.2, 0.3, 0.4, 0.5, 1, 1.1, 1.2, 1.3, 1.4, 1.5, 2, 3],
    SetpointAcc=100,
    CoolSeasonStart='01/11',
    CoolSeasonEnd='01/03',
    HVACmode=[2],
    VentCtrl=[2],
    MaxTempDiffVOF=20,
    MinTempDiffVOF=1,
    MultiplierVOF=0.2,
    VSToffset=[0],
    MinOToffset=[50],
    MaxWindSpeed=[50],
    ASTtol_steps=0.1,
    ASTtol_start=0.1,
    ASTtol_end_input=0.1,
    confirmGen=True
)
```

```
------------------------------------------------------------
Adaptive-Comfort-Control-Implemented Model (ACCIM) v0.7.0
------------------------------------------------------------

This tool allows to apply adaptive setpoint temperatures.
For further information, please read the documentation:
```

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```
https://accim.readthedocs.io/en/master/
For a visual understanding of the tool, please visit the following jupyter notebooks:
-    Using addAccis() to apply adaptive setpoint temperatures
https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_
↪notebooks/addAccis/using_addAccis.ipynb
-    Using rename_epw_files() to rename the EPWs for proper data analysis after␣
↪simulation
https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_
↪notebooks/rename_epw_files/using_rename_epw_files.ipynb
-    Using runEp() to directly run simulations with EnergyPlus
https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_
↪notebooks/runEp/using_runEp.ipynb
-    Using the class Table() for data analysis
https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_
↪notebooks/Table/using_Table.ipynb
-    Full example
https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_
↪notebooks/Table/using_Table.ipynb

Starting with the process.
Basic input data:
ScriptType is: vrf_mm
Supply Air Temperature Input Method is: temperature difference
Output type is: custom
Output frequencies are:
['hourly', 'runperiod']
EnergyPlus version is: 23.1
Temperature Control method is: temperature

======================START OF GENERIC IDF FILE GENERATION␣
↪PROCESS======================

Starting with file:
TestModel
IDD location is: C:\EnergyPlusV23-1-0\Energy+.idd
The occupied zones in the model TestModel are:
BLOCK1:ZONE2
BLOCK1:ZONE1
The windows and doors in the model TestModel are:
Block1_Zone2_Wall_3_0_0_0_0_0_Win
Block1_Zone2_Wall_4_0_0_0_0_0_Win
Block1_Zone2_Wall_5_0_0_0_0_0_Win
Block1_Zone1_Wall_2_0_0_0_0_0_Win
Block1_Zone1_Wall_3_0_0_0_0_0_Win
Block1_Zone1_Wall_5_0_0_0_0_0_Win
The zones in the model TestModel are:
BLOCK1_ZONE2
BLOCK1_ZONE1
The people objects in the model have been amended.
BLOCK1:ZONE2 Thermostat has been added
BLOCK1:ZONE1 Thermostat has been added
On Schedule already was in the model
```

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```
TypOperativeTempControlSch Schedule already was in the model
All ZoneHVAC:IdealLoadsAirSystem Heating and Cooling availability schedules has been set␣
↪to on
On 24/7 Schedule already was in the model
Control type schedule: Always 4 Schedule has been added
Relative humidity setpoint schedule: Always 50.00 Schedule has been added
Heating Fanger comfort setpoint: Always -0.5 Schedule has been added
Cooling Fanger comfort setpoint: Always  0.1 Schedule has been added
Zone CO2 setpoint: Always 900ppm Schedule has been added
Min CO2 concentration: Always 600ppm Schedule has been added
Generic contaminant setpoint: Always 0.5ppm Schedule has been added
Air distribution effectiveness (always 1) Schedule has been added
VRF Heating Cooling (Northern Hemisphere) Schedule has been added
DefaultFanEffRatioCurve Curve:Cubic Object has been added
VRFTUCoolCapFT Curve:Cubic Object has been added
VRFTUHeatCapFT Curve:Cubic Object has been added
VRFCoolCapFTBoundary Curve:Cubic Object has been added
VRFCoolEIRFTBoundary Curve:Cubic Object has been added
CoolingEIRLowPLR Curve:Cubic Object has been added
VRFHeatCapFTBoundary Curve:Cubic Object has been added
VRFHeatEIRFTBoundary Curve:Cubic Object has been added
HeatingEIRLowPLR Curve:Cubic Object has been added
DefaultFanPowerRatioCurve Curve:Exponent Object has been added
DXHtgCoilDefrostEIRFT Curve:Biquadratic Object has been added
VRFCoolCapFT Curve:Biquadratic Object has been added
VRFCoolCapFTHi Curve:Biquadratic Object has been added
VRFCoolEIRFT Curve:Biquadratic Object has been added
VRFCoolEIRFTHi Curve:Biquadratic Object has been added
VRFHeatCapFT Curve:Biquadratic Object has been added
VRFHeatCapFTHi Curve:Biquadratic Object has been added
VRFHeatEIRFT Curve:Biquadratic Object has been added
VRFHeatEIRFTHi Curve:Biquadratic Object has been added
CoolingLengthCorrectionFactor Curve:Biquadratic Object has been added
VRF Piping Correction Factor for Length in Heating Mode Curve:Biquadratic Object has␣
↪been added
VRF Heat Recovery Cooling Capacity Modifier Curve:Biquadratic Object has been added
VRF Heat Recovery Cooling Energy Modifier Curve:Biquadratic Object has been added
VRF Heat Recovery Heating Capacity Modifier Curve:Biquadratic Object has been added
VRF Heat Recovery Heating Energy Modifier Curve:Biquadratic Object has been added
VRFACCoolCapFFF Curve:Quadratic Object has been added
CoolingEIRHiPLR Curve:Quadratic Object has been added
VRFCPLFFPLR Curve:Quadratic Object has been added
HeatingEIRHiPLR Curve:Quadratic Object has been added
CoolingCombRatio Curve:Linear Object has been added
HeatingCombRatio Curve:Linear Object has been added
VRF Outdoor Unit_BLOCK1:ZONE2 AirConditioner:VariableRefrigerantFlow Object has been␣
↪added
VRF Outdoor Unit_BLOCK1:ZONE1 AirConditioner:VariableRefrigerantFlow Object has been␣
↪added
VRF Outdoor Unit_BLOCK1:ZONE2 Outdoor Air Node Object has been added
VRF Outdoor Unit_BLOCK1:ZONE2 Zone List Object has been added
VRF Outdoor Unit_BLOCK1:ZONE1 Outdoor Air Node Object has been added
```

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```
VRF Outdoor Unit_BLOCK1:ZONE1 Zone List Object has been added
BLOCK1:ZONE2 Sizing:Zone Object has been added
BLOCK1:ZONE1 Sizing:Zone Object has been added
BLOCK1:ZONE2 Design Specification Outdoor Air Object has been added
BLOCK1:ZONE1 Design Specification Outdoor Air Object has been added
BLOCK1:ZONE2 Design Specification Zone Air Distribution Object has been added
BLOCK1:ZONE1 Design Specification Zone Air Distribution Object has been added
BLOCK1:ZONE2 Nodelist Objects has been added
BLOCK1:ZONE1 Nodelist Objects has been added
BLOCK1:ZONE2 ZoneHVAC:EquipmentConnections Objects has been added
BLOCK1:ZONE1 ZoneHVAC:EquipmentConnections Objects has been added
BLOCK1:ZONE2 ZoneHVAC:EquipmentList Objects has been added
BLOCK1:ZONE1 ZoneHVAC:EquipmentList Objects has been added
BLOCK1:ZONE2 ZoneHVAC:TerminalUnit:VariableRefrigerantFlow Object has been added
BLOCK1:ZONE1 ZoneHVAC:TerminalUnit:VariableRefrigerantFlow Object has been added
BLOCK1:ZONE2 Coil:Cooling:DX:VariableRefrigerantFlow Object has been added
BLOCK1:ZONE1 Coil:Cooling:DX:VariableRefrigerantFlow Object has been added
BLOCK1:ZONE2 Coil:Heating:DX:VariableRefrigerantFlow Object has been added
BLOCK1:ZONE1 Coil:Heating:DX:VariableRefrigerantFlow Object has been added
BLOCK1:ZONE2 Fan:ConstantVolume Object has been added
BLOCK1:ZONE1 Fan:ConstantVolume Object has been added
Vent_SP_temp Schedule has been added
AHST_Sch_BLOCK1_ZONE2 Schedule has been added
ACST_Sch_BLOCK1_ZONE2 Schedule has been added
AHST_Sch_BLOCK1_ZONE1 Schedule has been added
ACST_Sch_BLOCK1_ZONE1 Schedule has been added
Added - SetComfTemp Program
Added - CountHours_BLOCK1_ZONE2 Program
Added - CountHours_BLOCK1_ZONE1 Program
Added - SetAppLimits Program
Added - ApplyCAT Program
Added - SetAST Program
Added - SetASTnoTol Program
Added - CountHoursNoApp_BLOCK1_ZONE2 Program
Added - SetGeoVarBLOCK1_ZONE2 Program
Added - CountHoursNoApp_BLOCK1_ZONE1 Program
Added - SetGeoVarBLOCK1_ZONE1 Program
Added - SetInputData Program
Added - SetVOFinputData Program
Added - SetVST Program
Added - ApplyAST_BLOCK1_ZONE2 Program
Added - ApplyAST_BLOCK1_ZONE1 Program
Added - SetMyVOF_Block1_Zone2_Wall_3_0_0_0_0_0_Win Program
Added - SetWindowOperation_Block1_Zone2_Wall_3_0_0_0_0_0_Win Program
Added - SetMyVOF_Block1_Zone2_Wall_4_0_0_0_0_0_Win Program
Added - SetWindowOperation_Block1_Zone2_Wall_4_0_0_0_0_0_Win Program
Added - SetMyVOF_Block1_Zone2_Wall_5_0_0_0_0_0_Win Program
Added - SetWindowOperation_Block1_Zone2_Wall_5_0_0_0_0_0_Win Program
Added - SetMyVOF_Block1_Zone1_Wall_2_0_0_0_0_0_Win Program
Added - SetWindowOperation_Block1_Zone1_Wall_2_0_0_0_0_0_Win Program
Added - SetMyVOF_Block1_Zone1_Wall_3_0_0_0_0_0_Win Program
Added - SetWindowOperation_Block1_Zone1_Wall_3_0_0_0_0_0_Win Program
```

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```
Added - SetMyVOF_Block1_Zone1_Wall_5_0_0_0_0_0_Win Program
Added - SetWindowOperation_Block1_Zone1_Wall_5_0_0_0_0_0_Win Program
Added - Comfort Temperature Output Variable
Added - Adaptive Cooling Setpoint Temperature Output Variable
Added - Adaptive Heating Setpoint Temperature Output Variable
Added - Adaptive Cooling Setpoint Temperature_No Tolerance Output Variable
Added - Adaptive Heating Setpoint Temperature_No Tolerance Output Variable
Added - Ventilation Setpoint Temperature Output Variable
Added - Minimum Outdoor Temperature for ventilation Output Variable
Added - Minimum Outdoor Temperature Difference for ventilation Output Variable
Added - Maximum Outdoor Temperature Difference for ventilation Output Variable
Added - Multiplier for Ventilation Opening Factor Output Variable
Added - Comfortable Hours_No Applicability_BLOCK1_ZONE2 Output Variable
Added - Comfortable Hours_No Applicability_BLOCK1_ZONE1 Output Variable
Added - Comfortable Hours_Applicability_BLOCK1_ZONE2 Output Variable
Added - Comfortable Hours_Applicability_BLOCK1_ZONE1 Output Variable
Added - Discomfortable Applicable Hot Hours_BLOCK1_ZONE2 Output Variable
Added - Discomfortable Applicable Hot Hours_BLOCK1_ZONE1 Output Variable
Added - Discomfortable Applicable Cold Hours_BLOCK1_ZONE2 Output Variable
Added - Discomfortable Applicable Cold Hours_BLOCK1_ZONE1 Output Variable
Added - Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE2 Output Variable
Added - Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE1 Output Variable
Added - Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE2 Output Variable
Added - Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE1 Output Variable
Added - Zone Floor Area_BLOCK1_ZONE2 Output Variable
Added - Zone Floor Area_BLOCK1_ZONE1 Output Variable
Added - Zone Air Volume_BLOCK1_ZONE2 Output Variable
Added - Zone Air Volume_BLOCK1_ZONE1 Output Variable
Added - Ventilation Hours_BLOCK1_ZONE2 Output Variable
Added - Ventilation Hours_BLOCK1_ZONE1 Output Variable
Global variables objects have been added
Internal variables objects have been added
Added - RMOT Sensor
Added - PMOT Sensor
Added - BLOCK1_ZONE2_OpT Sensor
Added - BLOCK1_ZONE2_WindSpeed Sensor
Added - BLOCK1_ZONE2_OutT Sensor
Added - BLOCK1_ZONE1_OpT Sensor
Added - BLOCK1_ZONE1_WindSpeed Sensor
Added - BLOCK1_ZONE1_OutT Sensor
Added - Block1_Zone2_Wall_3_0_0_0_0_0_Win_OpT Sensor
Added - Block1_Zone2_Wall_3_0_0_0_0_0_Win_WindSpeed Sensor
Added - Block1_Zone2_Wall_3_0_0_0_0_0_Win_OutT Sensor
Added - Block1_Zone2_Wall_4_0_0_0_0_0_Win_OpT Sensor
Added - Block1_Zone2_Wall_4_0_0_0_0_0_Win_WindSpeed Sensor
Added - Block1_Zone2_Wall_4_0_0_0_0_0_Win_OutT Sensor
Added - Block1_Zone2_Wall_5_0_0_0_0_0_Win_OpT Sensor
Added - Block1_Zone2_Wall_5_0_0_0_0_0_Win_WindSpeed Sensor
Added - Block1_Zone2_Wall_5_0_0_0_0_0_Win_OutT Sensor
Added - Block1_Zone1_Wall_2_0_0_0_0_0_Win_OpT Sensor
Added - Block1_Zone1_Wall_2_0_0_0_0_0_Win_WindSpeed Sensor
Added - Block1_Zone1_Wall_2_0_0_0_0_0_Win_OutT Sensor
```

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```
Added - Block1_Zone1_Wall_3_0_0_0_0_0_Win_OpT Sensor
Added - Block1_Zone1_Wall_3_0_0_0_0_0_Win_WindSpeed Sensor
Added - Block1_Zone1_Wall_3_0_0_0_0_0_Win_OutT Sensor
Added - Block1_Zone1_Wall_5_0_0_0_0_0_Win_OpT Sensor
Added - Block1_Zone1_Wall_5_0_0_0_0_0_Win_WindSpeed Sensor
Added - Block1_Zone1_Wall_5_0_0_0_0_0_Win_OutT Sensor
Added - OutT Sensor
Added - AHST_Act_BLOCK1_ZONE2 Actuator
Added - ACST_Act_BLOCK1_ZONE2 Actuator
Added - AHST_Act_BLOCK1_ZONE1 Actuator
Added - ACST_Act_BLOCK1_ZONE1 Actuator
Added - Block1_Zone2_Wall_3_0_0_0_0_0_Win_VentOpenFact Actuator
Added - Block1_Zone2_Wall_4_0_0_0_0_0_Win_VentOpenFact Actuator
Added - Block1_Zone2_Wall_5_0_0_0_0_0_Win_VentOpenFact Actuator
Added - Block1_Zone1_Wall_2_0_0_0_0_0_Win_VentOpenFact Actuator
Added - Block1_Zone1_Wall_3_0_0_0_0_0_Win_VentOpenFact Actuator
Added - Block1_Zone1_Wall_5_0_0_0_0_0_Win_VentOpenFact Actuator
Added - BLOCK1_ZONE2_CoolCoil Sensor
Added - BLOCK1_ZONE2_HeatCoil Sensor
Added - BLOCK1_ZONE1_CoolCoil Sensor
Added - BLOCK1_ZONE1_HeatCoil Sensor
Added - Block1_Zone2_Wall_3_0_0_0_0_0_Win_CoolCoil Sensor
Added - Block1_Zone2_Wall_3_0_0_0_0_0_Win_HeatCoil Sensor
Added - Block1_Zone2_Wall_4_0_0_0_0_0_Win_CoolCoil Sensor
Added - Block1_Zone2_Wall_4_0_0_0_0_0_Win_HeatCoil Sensor
Added - Block1_Zone2_Wall_5_0_0_0_0_0_Win_CoolCoil Sensor
Added - Block1_Zone2_Wall_5_0_0_0_0_0_Win_HeatCoil Sensor
Added - Block1_Zone1_Wall_2_0_0_0_0_0_Win_CoolCoil Sensor
Added - Block1_Zone1_Wall_2_0_0_0_0_0_Win_HeatCoil Sensor
Added - Block1_Zone1_Wall_3_0_0_0_0_0_Win_CoolCoil Sensor
Added - Block1_Zone1_Wall_3_0_0_0_0_0_Win_HeatCoil Sensor
Added - Block1_Zone1_Wall_5_0_0_0_0_0_Win_CoolCoil Sensor
Added - Block1_Zone1_Wall_5_0_0_0_0_0_Win_HeatCoil Sensor
Added - SetComfTemp Program Calling Manager
Added - CountHours_BLOCK1_ZONE2 Program Calling Manager
Added - CountHours_BLOCK1_ZONE1 Program Calling Manager
Added - SetAppLimits Program Calling Manager
Added - ApplyCAT Program Calling Manager
Added - SetAST Program Calling Manager
Added - SetASTnoTol Program Calling Manager
Added - CountHoursNoApp_BLOCK1_ZONE2 Program Calling Manager
Added - SetGeoVarBLOCK1_ZONE2 Program Calling Manager
Added - CountHoursNoApp_BLOCK1_ZONE1 Program Calling Manager
Added - SetGeoVarBLOCK1_ZONE1 Program Calling Manager
Added - SetInputData Program Calling Manager
Added - SetVOFinputData Program Calling Manager
Added - SetVST Program Calling Manager
Added - ApplyAST_BLOCK1_ZONE2 Program Calling Manager
Added - ApplyAST_BLOCK1_ZONE1 Program Calling Manager
Added - SetMyVOF_Block1_Zone2_Wall_3_0_0_0_0_0_Win Program Calling Manager
Added - SetWindowOperation_Block1_Zone2_Wall_3_0_0_0_0_0_Win Program Calling Manager
Added - SetMyVOF_Block1_Zone2_Wall_4_0_0_0_0_0_Win Program Calling Manager
```

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```
Added - SetWindowOperation_Block1_Zone2_Wall_4_0_0_0_0_0_Win Program Calling Manager
Added - SetMyVOF_Block1_Zone2_Wall_5_0_0_0_0_0_Win Program Calling Manager
Added - SetWindowOperation_Block1_Zone2_Wall_5_0_0_0_0_0_Win Program Calling Manager
Added - SetMyVOF_Block1_Zone1_Wall_2_0_0_0_0_0_Win Program Calling Manager
Added - SetWindowOperation_Block1_Zone1_Wall_2_0_0_0_0_0_Win Program Calling Manager
Added - SetMyVOF_Block1_Zone1_Wall_3_0_0_0_0_0_Win Program Calling Manager
Added - SetWindowOperation_Block1_Zone1_Wall_3_0_0_0_0_0_Win Program Calling Manager
Added - SetMyVOF_Block1_Zone1_Wall_5_0_0_0_0_0_Win Program Calling Manager
Added - SetWindowOperation_Block1_Zone1_Wall_5_0_0_0_0_0_Win Program Calling Manager
Added - Comfort Temperature Reporting FrequencyHourly Output:Variable data
Added - Adaptive Cooling Setpoint Temperature Reporting FrequencyHourly Output:Variable␣
↪data
Added - Adaptive Heating Setpoint Temperature Reporting FrequencyHourly Output:Variable␣
↪data
Added - Adaptive Cooling Setpoint Temperature_No Tolerance Reporting FrequencyHourly␣
↪Output:Variable data
Added - Adaptive Heating Setpoint Temperature_No Tolerance Reporting FrequencyHourly␣
↪Output:Variable data
Added - Ventilation Setpoint Temperature Reporting FrequencyHourly Output:Variable data
Added - Minimum Outdoor Temperature for ventilation Reporting FrequencyHourly Output:
↪Variable data
Added - Minimum Outdoor Temperature Difference for ventilation Reporting FrequencyHourly␣
↪Output:Variable data
Added - Maximum Outdoor Temperature Difference for ventilation Reporting FrequencyHourly␣
↪Output:Variable data
Added - Multiplier for Ventilation Opening Factor Reporting FrequencyHourly Output:
↪Variable data
Added - Comfortable Hours_No Applicability_BLOCK1_ZONE2 Reporting FrequencyHourly Output:
↪Variable data
Added - Comfortable Hours_No Applicability_BLOCK1_ZONE1 Reporting FrequencyHourly Output:
↪Variable data
Added - Comfortable Hours_Applicability_BLOCK1_ZONE2 Reporting FrequencyHourly Output:
↪Variable data
Added - Comfortable Hours_Applicability_BLOCK1_ZONE1 Reporting FrequencyHourly Output:
↪Variable data
Added - Discomfortable Applicable Hot Hours_BLOCK1_ZONE2 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Applicable Hot Hours_BLOCK1_ZONE1 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Applicable Cold Hours_BLOCK1_ZONE2 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Applicable Cold Hours_BLOCK1_ZONE1 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE2 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE1 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE2 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE1 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Zone Floor Area_BLOCK1_ZONE2 Reporting FrequencyHourly Output:Variable data
```

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```
Added - Zone Floor Area_BLOCK1_ZONE1 Reporting FrequencyHourly Output:Variable data
Added - Zone Air Volume_BLOCK1_ZONE2 Reporting FrequencyHourly Output:Variable data
Added - Zone Air Volume_BLOCK1_ZONE1 Reporting FrequencyHourly Output:Variable data
Added - Ventilation Hours_BLOCK1_ZONE2 Reporting FrequencyHourly Output:Variable data
Added - Ventilation Hours_BLOCK1_ZONE1 Reporting FrequencyHourly Output:Variable data
Added - Zone Operative Temperature Reporting FrequencyHourly Output:Variable data
Added - Zone Thermal Comfort CEN 15251 Adaptive Model Running Average Outdoor Air␣
↪Temperature Reporting FrequencyHourly Output:Variable data
Added - Zone Thermal Comfort ASHRAE 55 Adaptive Model Running Average Outdoor Air␣
↪Temperature Reporting FrequencyHourly Output:Variable data
Added - Cooling Coil Total Cooling Rate Reporting FrequencyHourly Output:Variable data
Added - Heating Coil Heating Rate Reporting FrequencyHourly Output:Variable data
Added - Facility Total HVAC Electric Demand Power Reporting FrequencyHourly Output:
↪Variable data
Added - Facility Total HVAC Electricity Demand Rate Reporting FrequencyHourly Output:
↪Variable data
Added - AFN Surface Venting Window or Door Opening Factor Reporting FrequencyHourly␣
↪Output:Variable data
Added - AFN Zone Infiltration Air Change Rate Reporting FrequencyHourly Output:Variable␣
↪data
Added - AFN Zone Infiltration Volume Reporting FrequencyHourly Output:Variable data
Added - AFN Zone Ventilation Air Change Rate Reporting FrequencyHourly Output:Variable␣
↪data
Added - AFN Zone Ventilation Volume Reporting FrequencyHourly Output:Variable data
Added - Site Outdoor Air Drybulb Temperature Reporting FrequencyHourly Output:Variable␣
↪data
Added - Site Wind Speed Reporting FrequencyHourly Output:Variable data
Added - Site Outdoor Air Relative Humidity Reporting FrequencyHourly Output:Variable data
Added - AHST_Sch_BLOCK1_ZONE2 Reporting FrequencyHourly Output:Variable data
Added - ACST_Sch_BLOCK1_ZONE2 Reporting FrequencyHourly Output:Variable data
Added - AHST_Sch_BLOCK1_ZONE1 Reporting FrequencyHourly Output:Variable data
Added - ACST_Sch_BLOCK1_ZONE1 Reporting FrequencyHourly Output:Variable data
Added - VRF Heat Pump Cooling Electricity Energy Reporting FrequencyHourly Output:
↪Variable data
Added - VRF Heat Pump Heating Electricity Energy Reporting FrequencyHourly Output:
↪Variable data
Added - BLOCK1_ZONE2 VRF Indoor Unit DX Cooling Coil Reporting FrequencyHourly Output:
↪Variable data
Added - BLOCK1_ZONE2 VRF Indoor Unit DX Heating Coil Reporting Frequency Hourly Output:
↪Variable data
Added - BLOCK1_ZONE1 VRF Indoor Unit DX Cooling Coil Reporting FrequencyHourly Output:
↪Variable data
Added - BLOCK1_ZONE1 VRF Indoor Unit DX Heating Coil Reporting Frequency Hourly Output:
↪Variable data
Added - Comfort Temperature Reporting FrequencyRunperiod Output:Variable data
Added - Adaptive Cooling Setpoint Temperature Reporting FrequencyRunperiod Output:
↪Variable data
Added - Adaptive Heating Setpoint Temperature Reporting FrequencyRunperiod Output:
↪Variable data
Added - Adaptive Cooling Setpoint Temperature_No Tolerance Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Adaptive Heating Setpoint Temperature_No Tolerance Reporting FrequencyRunperiod␣
```

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```
↪Output:Variable data
Added - Ventilation Setpoint Temperature Reporting FrequencyRunperiod Output:Variable␣
↪data
Added - Minimum Outdoor Temperature for ventilation Reporting FrequencyRunperiod Output:
↪Variable data
Added - Minimum Outdoor Temperature Difference for ventilation Reporting␣
↪FrequencyRunperiod Output:Variable data
Added - Maximum Outdoor Temperature Difference for ventilation Reporting␣
↪FrequencyRunperiod Output:Variable data
Added - Multiplier for Ventilation Opening Factor Reporting FrequencyRunperiod Output:
↪Variable data
Added - Comfortable Hours_No Applicability_BLOCK1_ZONE2 Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Comfortable Hours_No Applicability_BLOCK1_ZONE1 Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Comfortable Hours_Applicability_BLOCK1_ZONE2 Reporting FrequencyRunperiod Output:
↪Variable data
Added - Comfortable Hours_Applicability_BLOCK1_ZONE1 Reporting FrequencyRunperiod Output:
↪Variable data
Added - Discomfortable Applicable Hot Hours_BLOCK1_ZONE2 Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Discomfortable Applicable Hot Hours_BLOCK1_ZONE1 Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Discomfortable Applicable Cold Hours_BLOCK1_ZONE2 Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Discomfortable Applicable Cold Hours_BLOCK1_ZONE1 Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE2 Reporting␣
↪FrequencyRunperiod Output:Variable data
Added - Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE1 Reporting␣
↪FrequencyRunperiod Output:Variable data
Added - Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE2 Reporting␣
↪FrequencyRunperiod Output:Variable data
Added - Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE1 Reporting␣
↪FrequencyRunperiod Output:Variable data
Added - Zone Floor Area_BLOCK1_ZONE2 Reporting FrequencyRunperiod Output:Variable data
Added - Zone Floor Area_BLOCK1_ZONE1 Reporting FrequencyRunperiod Output:Variable data
Added - Zone Air Volume_BLOCK1_ZONE2 Reporting FrequencyRunperiod Output:Variable data
Added - Zone Air Volume_BLOCK1_ZONE1 Reporting FrequencyRunperiod Output:Variable data
Added - Ventilation Hours_BLOCK1_ZONE2 Reporting FrequencyRunperiod Output:Variable data
Added - Ventilation Hours_BLOCK1_ZONE1 Reporting FrequencyRunperiod Output:Variable data
Added - Zone Operative Temperature Reporting FrequencyRunperiod Output:Variable data
Added - Zone Thermal Comfort CEN 15251 Adaptive Model Running Average Outdoor Air␣
↪Temperature Reporting FrequencyRunperiod Output:Variable data
Added - Zone Thermal Comfort ASHRAE 55 Adaptive Model Running Average Outdoor Air␣
↪Temperature Reporting FrequencyRunperiod Output:Variable data
Added - Cooling Coil Total Cooling Rate Reporting FrequencyRunperiod Output:Variable data
Added - Heating Coil Heating Rate Reporting FrequencyRunperiod Output:Variable data
Added - Facility Total HVAC Electric Demand Power Reporting FrequencyRunperiod Output:
↪Variable data
Added - Facility Total HVAC Electricity Demand Rate Reporting FrequencyRunperiod Output:
↪Variable data
```

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```
Added - AFN Surface Venting Window or Door Opening Factor Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - AFN Zone Infiltration Air Change Rate Reporting FrequencyRunperiod Output:
↪Variable data
Added - AFN Zone Infiltration Volume Reporting FrequencyRunperiod Output:Variable data
Added - AFN Zone Ventilation Air Change Rate Reporting FrequencyRunperiod Output:
↪Variable data
Added - AFN Zone Ventilation Volume Reporting FrequencyRunperiod Output:Variable data
Added - Site Outdoor Air Drybulb Temperature Reporting FrequencyRunperiod Output:
↪Variable data
Added - Site Wind Speed Reporting FrequencyRunperiod Output:Variable data
Added - Site Outdoor Air Relative Humidity Reporting FrequencyRunperiod Output:Variable␣
↪data
Added - AHST_Sch_BLOCK1_ZONE2 Reporting FrequencyRunperiod Output:Variable data
Added - ACST_Sch_BLOCK1_ZONE2 Reporting FrequencyRunperiod Output:Variable data
Added - AHST_Sch_BLOCK1_ZONE1 Reporting FrequencyRunperiod Output:Variable data
Added - ACST_Sch_BLOCK1_ZONE1 Reporting FrequencyRunperiod Output:Variable data
Added - VRF Heat Pump Cooling Electricity Energy Reporting FrequencyRunperiod Output:
↪Variable data
Added - VRF Heat Pump Heating Electricity Energy Reporting FrequencyRunperiod Output:
↪Variable data
Added - BLOCK1_ZONE2 VRF Indoor Unit DX Cooling Coil Reporting FrequencyRunperiod Output:
↪Variable data
Added - BLOCK1_ZONE2 VRF Indoor Unit DX Heating Coil Reporting Frequency Runperiod␣
↪Output:Variable data
Added - BLOCK1_ZONE1 VRF Indoor Unit DX Cooling Coil Reporting FrequencyRunperiod Output:
↪Variable data
Added - BLOCK1_ZONE1 VRF Indoor Unit DX Heating Coil Reporting Frequency Runperiod␣
↪Output:Variable data
Not added - AFN Surface Venting Window or Door Opening Factor Reporting FrequencyHourly␣
↪Output:Variable data
Not added - AFN Surface Venting Window or Door Opening Factor Reporting␣
↪FrequencyRunperiod Output:Variable data

The current existing outputs for Hourly Frequency are:
Comfort Temperature
Adaptive Cooling Setpoint Temperature
Adaptive Heating Setpoint Temperature
Adaptive Cooling Setpoint Temperature_No Tolerance
Adaptive Heating Setpoint Temperature_No Tolerance
Ventilation Setpoint Temperature
Minimum Outdoor Temperature for ventilation
Minimum Outdoor Temperature Difference for ventilation
Maximum Outdoor Temperature Difference for ventilation
Multiplier for Ventilation Opening Factor
Comfortable Hours_No Applicability_BLOCK1_ZONE2
Comfortable Hours_No Applicability_BLOCK1_ZONE1
Comfortable Hours_Applicability_BLOCK1_ZONE2
Comfortable Hours_Applicability_BLOCK1_ZONE1
Discomfortable Applicable Hot Hours_BLOCK1_ZONE2
Discomfortable Applicable Hot Hours_BLOCK1_ZONE1
Discomfortable Applicable Cold Hours_BLOCK1_ZONE2
```

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```
Discomfortable Applicable Cold Hours_BLOCK1_ZONE1
Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE2
Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE1
Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE2
Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE1
Zone Floor Area_BLOCK1_ZONE2
Zone Floor Area_BLOCK1_ZONE1
Zone Air Volume_BLOCK1_ZONE2
Zone Air Volume_BLOCK1_ZONE1
Ventilation Hours_BLOCK1_ZONE2
Ventilation Hours_BLOCK1_ZONE1
Zone Operative Temperature
Zone Thermal Comfort CEN 15251 Adaptive Model Running Average Outdoor Air Temperature
Zone Thermal Comfort ASHRAE 55 Adaptive Model Running Average Outdoor Air Temperature
Cooling Coil Total Cooling Rate
Heating Coil Heating Rate
Facility Total HVAC Electric Demand Power
Facility Total HVAC Electricity Demand Rate
AFN Surface Venting Window or Door Opening Factor
AFN Zone Infiltration Air Change Rate
AFN Zone Infiltration Volume
AFN Zone Ventilation Air Change Rate
AFN Zone Ventilation Volume
Site Outdoor Air Drybulb Temperature
Site Wind Speed
Site Outdoor Air Relative Humidity
Schedule Value
VRF Heat Pump Cooling Electricity Energy
VRF Heat Pump Heating Electricity Energy
Do you want to remove some input or keep it and remove all others? Please enter remove␣
↪or keep:keep
Please enter these outputs (which must be contained in the list above) separated by␣
↪semicolon (;):
  @media print {
    .ms-editor-squiggles-container {
      display:none !important;
    }
  }
  .ms-editor-squiggles-container {
    all: initial;
  }Zone Operative Temperature;Adaptive Cooling Setpoint Temperature_No Tolerance;
↪Adaptive Heating Setpoint Temperature_No Tolerance

The current existing outputs for Runperiod Frequency are:
Comfort Temperature
Adaptive Cooling Setpoint Temperature
Adaptive Heating Setpoint Temperature
Adaptive Cooling Setpoint Temperature_No Tolerance
Adaptive Heating Setpoint Temperature_No Tolerance
Ventilation Setpoint Temperature
Minimum Outdoor Temperature for ventilation
Minimum Outdoor Temperature Difference for ventilation
```

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```
Maximum Outdoor Temperature Difference for ventilation
Multiplier for Ventilation Opening Factor
Comfortable Hours_No Applicability_BLOCK1_ZONE2
Comfortable Hours_No Applicability_BLOCK1_ZONE1
Comfortable Hours_Applicability_BLOCK1_ZONE2
Comfortable Hours_Applicability_BLOCK1_ZONE1
Discomfortable Applicable Hot Hours_BLOCK1_ZONE2
Discomfortable Applicable Hot Hours_BLOCK1_ZONE1
Discomfortable Applicable Cold Hours_BLOCK1_ZONE2
Discomfortable Applicable Cold Hours_BLOCK1_ZONE1
Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE2
Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE1
Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE2
Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE1
Zone Floor Area_BLOCK1_ZONE2
Zone Floor Area_BLOCK1_ZONE1
Zone Air Volume_BLOCK1_ZONE2
Zone Air Volume_BLOCK1_ZONE1
Ventilation Hours_BLOCK1_ZONE2
Ventilation Hours_BLOCK1_ZONE1
Zone Operative Temperature
Zone Thermal Comfort CEN 15251 Adaptive Model Running Average Outdoor Air Temperature
Zone Thermal Comfort ASHRAE 55 Adaptive Model Running Average Outdoor Air Temperature
Cooling Coil Total Cooling Rate
Heating Coil Heating Rate
Facility Total HVAC Electric Demand Power
Facility Total HVAC Electricity Demand Rate
AFN Surface Venting Window or Door Opening Factor
AFN Zone Infiltration Air Change Rate
AFN Zone Infiltration Volume
AFN Zone Ventilation Air Change Rate
AFN Zone Ventilation Volume
Site Outdoor Air Drybulb Temperature
Site Wind Speed
Site Outdoor Air Relative Humidity
Schedule Value
VRF Heat Pump Cooling Electricity Energy
VRF Heat Pump Heating Electricity Energy
Do you want to remove some input or keep it and remove all others? Please enter remove␣
↪or keep:keep
Please enter these outputs (which must be contained in the list above) separated by␣
↪semicolon (;):
  @media print {
    .ms-editor-squiggles-container {
      display:none !important;
    }
  }
  .ms-editor-squiggles-container {
    all: initial;
  }Zone Operative Temperature;Adaptive Cooling Setpoint Temperature_No Tolerance;
↪Adaptive Heating Setpoint Temperature_No Tolerance
IDF has been saved
```

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```
Ending with file:
TestModel

=======================END OF GENERIC IDF FILE GENERATION PROCESS=======================

The following IDFs will not work, and therefore these will be deleted:
None

=======================START OF OUTPUT IDF FILES GENERATION␣
↪PROCESS=======================

The list of output IDFs is going to be:
TestModel[CS_INT EN16798[CA_1[CM_0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_1[CM_1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_1[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_1[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
And the total number of output IDFs is going to be 36
Generating the following output IDF files:
TestModel[CS_INT EN16798[CA_1[CM_0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_1[CM_1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
```

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```
TestModel[CS_INT EN16798[CA_1[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_1[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf

======================END OF OUTPUT IDF FILES GENERATION PROCESS=======================
```

Now, let's inspect the Output:Variable objects in both the input idf and any of the output idfs, for instance, the first one.

[27]:
```
input_testmodel = add_accis_instance.input_idfs['TestModel']
input_testmodel.idfobjects['Output:Variable']
```

[27]:
```
[]
```

We can see there is no Output:Variable object in the input idf. Now let's see some output idf.

[28]:
```
output_testmodel = add_accis_instance.output_idfs[
    'TestModel[CS_INT EN16798[CA_1[CM_0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf'
]
output_testmodel.idfobjects['Output:Variable']
```

[28]:
```
[
```

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```
OUTPUT:VARIABLE,
    *,                          !- Key Value
    Adaptive Cooling Setpoint Temperature_No Tolerance,    !- Variable Name
    Hourly,                     !- Reporting Frequency
    ;                           !- Schedule Name
,
OUTPUT:VARIABLE,
    *,                          !- Key Value
    Adaptive Heating Setpoint Temperature_No Tolerance,    !- Variable Name
    Hourly,                     !- Reporting Frequency
    ;                           !- Schedule Name
,
OUTPUT:VARIABLE,
    *,                          !- Key Value
    Zone Operative Temperature,    !- Variable Name
    Hourly,                     !- Reporting Frequency
    ;                           !- Schedule Name
,
OUTPUT:VARIABLE,
    *,                          !- Key Value
    Adaptive Cooling Setpoint Temperature_No Tolerance,    !- Variable Name
    Runperiod,                  !- Reporting Frequency
    ;                           !- Schedule Name
,
OUTPUT:VARIABLE,
    *,                          !- Key Value
    Adaptive Heating Setpoint Temperature_No Tolerance,    !- Variable Name
    Runperiod,                  !- Reporting Frequency
    ;                           !- Schedule Name
,
OUTPUT:VARIABLE,
    *,                          !- Key Value
    Zone Operative Temperature,    !- Variable Name
    Runperiod,                  !- Reporting Frequency
    ;                           !- Schedule Name
]
```

We can see in this case 6 Output:Variable objects, which are the ones we previously requested: - Zone Operative Temperature - Adaptive Cooling Setpoint Temperature_No Tolerance - Adaptive Heating Setpoint Temperature_No Tolerance

in both Hourly and Runperiod Reporting Frequencies.

As usual, let's remove all the output idfs, so that we can re-run the notebook.

[29]:
```
for i in os.listdir():
    if i.endswith('.idf') and input_idf[0] not in i:
        os.remove(i)
```

8.2.2.2 2.2.2 Using `Output_gen_dataframe` and `Output_take_dataframe`

Similar to section 2.2.1, imagine you need to perform a large number of simulations. Therefore, using Output_type='standard' would result in a heavy dataset. Using Output_type='simplified' is not an option, since you need more outputs than just the operative temperature, heating coil heating rate and cooling coil total cooling rate. In that case, you can use `Output_gen_dataframe` and `Output_take_dataframe`.

First of all, let's see the idfs we do have in this path:

[30]:
```
from os import listdir
input_idfs = [i for i in listdir() if i.endswith('.idf')]
input_idfs
```

[30]:
```
['TestModel.idf']
```

Now, we can go for it. Let's apply the adaptive setpoint temperatures. We want to see what outputs we would have if we run this script, therefore, we need to specify `Output_gen_dataframe=True`. Since we don't want to generate the output idfs yet, in this case let's specify `confirmGen=False`.

[31]:
```
from accim.sim import accis
add_accis_instance = accis.addAccis(
    ScriptType='vrf_mm',
    SupplyAirTempInputMethod='temperature difference',
    Output_keep_existing=False,
    Output_type='standard',
    Output_freqs=['hourly', 'runperiod'],
    Output_gen_dataframe=True,
    EnergyPlus_version='23.1',
    TempCtrl='temperature',
    ComfStand=[1, 14],
    CAT=[1, 2, 3, 80, 90],
    ComfMod=[0, 0.1, 0.2, 0.3, 0.4, 0.5, 1, 1.1, 1.2, 1.3, 1.4, 1.5, 2, 3],
    SetpointAcc=100,
    CoolSeasonStart='01/11',
    CoolSeasonEnd='01/03',
    HVACmode=[2],
    VentCtrl=[2],
    MaxTempDiffVOF=20,
    MinTempDiffVOF=1,
    MultiplierVOF=0.2,
    VSToffset=[0],
    MinOToffset=[50],
    MaxWindSpeed=[50],
    ASTtol_steps=0.1,
    ASTtol_start=0.1,
    ASTtol_end_input=0.1,
    confirmGen=False
)
```

```
------------------------------------------------------------
Adaptive-Comfort-Control-Implemented Model (ACCIM) v0.7.0
------------------------------------------------------------

This tool allows to apply adaptive setpoint temperatures.
```

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```
For further information, please read the documentation:
https://accim.readthedocs.io/en/master/
For a visual understanding of the tool, please visit the following jupyter notebooks:
-    Using addAccis() to apply adaptive setpoint temperatures
https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_
↪notebooks/addAccis/using_addAccis.ipynb
-    Using rename_epw_files() to rename the EPWs for proper data analysis after␣
↪simulation
https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_
↪notebooks/rename_epw_files/using_rename_epw_files.ipynb
-    Using runEp() to directly run simulations with EnergyPlus
https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_
↪notebooks/runEp/using_runEp.ipynb
-    Using the class Table() for data analysis
https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_
↪notebooks/Table/using_Table.ipynb
-    Full example
https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_
↪notebooks/Table/using_Table.ipynb

Starting with the process.
Basic input data:
ScriptType is: vrf_mm
Supply Air Temperature Input Method is: temperature difference
Output type is: standard
Output frequencies are:
['hourly', 'runperiod']
EnergyPlus version is: 23.1
Temperature Control method is: temperature

=======================START OF GENERIC IDF FILE GENERATION␣
↪PROCESS=======================

Starting with file:
TestModel
IDD location is: C:\EnergyPlusV23-1-0\Energy+.idd
The occupied zones in the model TestModel are:
BLOCK1:ZONE2
BLOCK1:ZONE1
The windows and doors in the model TestModel are:
Block1_Zone2_Wall_3_0_0_0_0_0_Win
Block1_Zone2_Wall_4_0_0_0_0_0_Win
Block1_Zone2_Wall_5_0_0_0_0_0_Win
Block1_Zone1_Wall_2_0_0_0_0_0_Win
Block1_Zone1_Wall_3_0_0_0_0_0_Win
Block1_Zone1_Wall_5_0_0_0_0_0_Win
The zones in the model TestModel are:
BLOCK1_ZONE2
BLOCK1_ZONE1
The people objects in the model have been amended.
BLOCK1:ZONE2 Thermostat has been added
BLOCK1:ZONE1 Thermostat has been added
```

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```
On Schedule already was in the model
TypOperativeTempControlSch Schedule already was in the model
All ZoneHVAC:IdealLoadsAirSystem Heating and Cooling availability schedules has been set␣
↪to on
On 24/7 Schedule already was in the model
Control type schedule: Always 4 Schedule has been added
Relative humidity setpoint schedule: Always 50.00 Schedule has been added
Heating Fanger comfort setpoint: Always -0.5 Schedule has been added
Cooling Fanger comfort setpoint: Always  0.1 Schedule has been added
Zone CO2 setpoint: Always 900ppm Schedule has been added
Min CO2 concentration: Always 600ppm Schedule has been added
Generic contaminant setpoint: Always 0.5ppm Schedule has been added
Air distribution effectiveness (always 1) Schedule has been added
VRF Heating Cooling (Northern Hemisphere) Schedule has been added
DefaultFanEffRatioCurve Curve:Cubic Object has been added
VRFTUCoolCapFT Curve:Cubic Object has been added
VRFTUHeatCapFT Curve:Cubic Object has been added
VRFCoolCapFTBoundary Curve:Cubic Object has been added
VRFCoolEIRFTBoundary Curve:Cubic Object has been added
CoolingEIRLowPLR Curve:Cubic Object has been added
VRFHeatCapFTBoundary Curve:Cubic Object has been added
VRFHeatEIRFTBoundary Curve:Cubic Object has been added
HeatingEIRLowPLR Curve:Cubic Object has been added
DefaultFanPowerRatioCurve Curve:Exponent Object has been added
DXHtgCoilDefrostEIRFT Curve:Biquadratic Object has been added
VRFCoolCapFT Curve:Biquadratic Object has been added
VRFCoolCapFTHi Curve:Biquadratic Object has been added
VRFCoolEIRFT Curve:Biquadratic Object has been added
VRFCoolEIRFTHi Curve:Biquadratic Object has been added
VRFHeatCapFT Curve:Biquadratic Object has been added
VRFHeatCapFTHi Curve:Biquadratic Object has been added
VRFHeatEIRFT Curve:Biquadratic Object has been added
VRFHeatEIRFTHi Curve:Biquadratic Object has been added
CoolingLengthCorrectionFactor Curve:Biquadratic Object has been added
VRF Piping Correction Factor for Length in Heating Mode Curve:Biquadratic Object has␣
↪been added
VRF Heat Recovery Cooling Capacity Modifier Curve:Biquadratic Object has been added
VRF Heat Recovery Cooling Energy Modifier Curve:Biquadratic Object has been added
VRF Heat Recovery Heating Capacity Modifier Curve:Biquadratic Object has been added
VRF Heat Recovery Heating Energy Modifier Curve:Biquadratic Object has been added
VRFACCoolCapFFF Curve:Quadratic Object has been added
CoolingEIRHiPLR Curve:Quadratic Object has been added
VRFCPLFFPLR Curve:Quadratic Object has been added
HeatingEIRHiPLR Curve:Quadratic Object has been added
CoolingCombRatio Curve:Linear Object has been added
HeatingCombRatio Curve:Linear Object has been added
VRF Outdoor Unit_BLOCK1:ZONE2 AirConditioner:VariableRefrigerantFlow Object has been␣
↪added
VRF Outdoor Unit_BLOCK1:ZONE1 AirConditioner:VariableRefrigerantFlow Object has been␣
↪added
VRF Outdoor Unit_BLOCK1:ZONE2 Outdoor Air Node Object has been added
VRF Outdoor Unit_BLOCK1:ZONE2 Zone List Object has been added
```

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```
VRF Outdoor Unit_BLOCK1:ZONE1 Outdoor Air Node Object has been added
VRF Outdoor Unit_BLOCK1:ZONE1 Zone List Object has been added
BLOCK1:ZONE2 Sizing:Zone Object has been added
BLOCK1:ZONE1 Sizing:Zone Object has been added
BLOCK1:ZONE2 Design Specification Outdoor Air Object has been added
BLOCK1:ZONE1 Design Specification Outdoor Air Object has been added
BLOCK1:ZONE2 Design Specification Zone Air Distribution Object has been added
BLOCK1:ZONE1 Design Specification Zone Air Distribution Object has been added
BLOCK1:ZONE2 Nodelist Objects has been added
BLOCK1:ZONE1 Nodelist Objects has been added
BLOCK1:ZONE2 ZoneHVAC:EquipmentConnections Objects has been added
BLOCK1:ZONE1 ZoneHVAC:EquipmentConnections Objects has been added
BLOCK1:ZONE2 ZoneHVAC:EquipmentList Objects has been added
BLOCK1:ZONE1 ZoneHVAC:EquipmentList Objects has been added
BLOCK1:ZONE2 ZoneHVAC:TerminalUnit:VariableRefrigerantFlow Object has been added
BLOCK1:ZONE1 ZoneHVAC:TerminalUnit:VariableRefrigerantFlow Object has been added
BLOCK1:ZONE2 Coil:Cooling:DX:VariableRefrigerantFlow Object has been added
BLOCK1:ZONE1 Coil:Cooling:DX:VariableRefrigerantFlow Object has been added
BLOCK1:ZONE2 Coil:Heating:DX:VariableRefrigerantFlow Object has been added
BLOCK1:ZONE1 Coil:Heating:DX:VariableRefrigerantFlow Object has been added
BLOCK1:ZONE2 Fan:ConstantVolume Object has been added
BLOCK1:ZONE1 Fan:ConstantVolume Object has been added
Vent_SP_temp Schedule has been added
AHST_Sch_BLOCK1_ZONE2 Schedule has been added
ACST_Sch_BLOCK1_ZONE2 Schedule has been added
AHST_Sch_BLOCK1_ZONE1 Schedule has been added
ACST_Sch_BLOCK1_ZONE1 Schedule has been added
Added - SetComfTemp Program
Added - CountHours_BLOCK1_ZONE2 Program
Added - CountHours_BLOCK1_ZONE1 Program
Added - SetAppLimits Program
Added - ApplyCAT Program
Added - SetAST Program
Added - SetASTnoTol Program
Added - CountHoursNoApp_BLOCK1_ZONE2 Program
Added - SetGeoVarBLOCK1_ZONE2 Program
Added - CountHoursNoApp_BLOCK1_ZONE1 Program
Added - SetGeoVarBLOCK1_ZONE1 Program
Added - SetInputData Program
Added - SetVOFinputData Program
Added - SetVST Program
Added - ApplyAST_BLOCK1_ZONE2 Program
Added - ApplyAST_BLOCK1_ZONE1 Program
Added - SetMyVOF_Block1_Zone2_Wall_3_0_0_0_0_0_Win Program
Added - SetWindowOperation_Block1_Zone2_Wall_3_0_0_0_0_0_Win Program
Added - SetMyVOF_Block1_Zone2_Wall_4_0_0_0_0_0_Win Program
Added - SetWindowOperation_Block1_Zone2_Wall_4_0_0_0_0_0_Win Program
Added - SetMyVOF_Block1_Zone2_Wall_5_0_0_0_0_0_Win Program
Added - SetWindowOperation_Block1_Zone2_Wall_5_0_0_0_0_0_Win Program
Added - SetMyVOF_Block1_Zone1_Wall_2_0_0_0_0_0_Win Program
Added - SetWindowOperation_Block1_Zone1_Wall_2_0_0_0_0_0_Win Program
Added - SetMyVOF_Block1_Zone1_Wall_3_0_0_0_0_0_Win Program
```

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```
Added - SetWindowOperation_Block1_Zone1_Wall_3_0_0_0_0_0_Win Program
Added - SetMyVOF_Block1_Zone1_Wall_5_0_0_0_0_0_Win Program
Added - SetWindowOperation_Block1_Zone1_Wall_5_0_0_0_0_0_Win Program
Added - Comfort Temperature Output Variable
Added - Adaptive Cooling Setpoint Temperature Output Variable
Added - Adaptive Heating Setpoint Temperature Output Variable
Added - Adaptive Cooling Setpoint Temperature_No Tolerance Output Variable
Added - Adaptive Heating Setpoint Temperature_No Tolerance Output Variable
Added - Ventilation Setpoint Temperature Output Variable
Added - Minimum Outdoor Temperature for ventilation Output Variable
Added - Minimum Outdoor Temperature Difference for ventilation Output Variable
Added - Maximum Outdoor Temperature Difference for ventilation Output Variable
Added - Multiplier for Ventilation Opening Factor Output Variable
Added - Comfortable Hours_No Applicability_BLOCK1_ZONE2 Output Variable
Added - Comfortable Hours_No Applicability_BLOCK1_ZONE1 Output Variable
Added - Comfortable Hours_Applicability_BLOCK1_ZONE2 Output Variable
Added - Comfortable Hours_Applicability_BLOCK1_ZONE1 Output Variable
Added - Discomfortable Applicable Hot Hours_BLOCK1_ZONE2 Output Variable
Added - Discomfortable Applicable Hot Hours_BLOCK1_ZONE1 Output Variable
Added - Discomfortable Applicable Cold Hours_BLOCK1_ZONE2 Output Variable
Added - Discomfortable Applicable Cold Hours_BLOCK1_ZONE1 Output Variable
Added - Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE2 Output Variable
Added - Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE1 Output Variable
Added - Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE2 Output Variable
Added - Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE1 Output Variable
Added - Zone Floor Area_BLOCK1_ZONE2 Output Variable
Added - Zone Floor Area_BLOCK1_ZONE1 Output Variable
Added - Zone Air Volume_BLOCK1_ZONE2 Output Variable
Added - Zone Air Volume_BLOCK1_ZONE1 Output Variable
Added - Ventilation Hours_BLOCK1_ZONE2 Output Variable
Added - Ventilation Hours_BLOCK1_ZONE1 Output Variable
Global variables objects have been added
Internal variables objects have been added
Added - RMOT Sensor
Added - PMOT Sensor
Added - BLOCK1_ZONE2_OpT Sensor
Added - BLOCK1_ZONE2_WindSpeed Sensor
Added - BLOCK1_ZONE2_OutT Sensor
Added - BLOCK1_ZONE1_OpT Sensor
Added - BLOCK1_ZONE1_WindSpeed Sensor
Added - BLOCK1_ZONE1_OutT Sensor
Added - Block1_Zone2_Wall_3_0_0_0_0_0_Win_OpT Sensor
Added - Block1_Zone2_Wall_3_0_0_0_0_0_Win_WindSpeed Sensor
Added - Block1_Zone2_Wall_3_0_0_0_0_0_Win_OutT Sensor
Added - Block1_Zone2_Wall_4_0_0_0_0_0_Win_OpT Sensor
Added - Block1_Zone2_Wall_4_0_0_0_0_0_Win_WindSpeed Sensor
Added - Block1_Zone2_Wall_4_0_0_0_0_0_Win_OutT Sensor
Added - Block1_Zone2_Wall_5_0_0_0_0_0_Win_OpT Sensor
Added - Block1_Zone2_Wall_5_0_0_0_0_0_Win_WindSpeed Sensor
Added - Block1_Zone2_Wall_5_0_0_0_0_0_Win_OutT Sensor
Added - Block1_Zone1_Wall_2_0_0_0_0_0_Win_OpT Sensor
Added - Block1_Zone1_Wall_2_0_0_0_0_0_Win_WindSpeed Sensor
```

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```
Added - Block1_Zone1_Wall_2_0_0_0_0_0_Win_OutT Sensor
Added - Block1_Zone1_Wall_3_0_0_0_0_0_Win_OpT Sensor
Added - Block1_Zone1_Wall_3_0_0_0_0_0_Win_WindSpeed Sensor
Added - Block1_Zone1_Wall_3_0_0_0_0_0_Win_OutT Sensor
Added - Block1_Zone1_Wall_5_0_0_0_0_0_Win_OpT Sensor
Added - Block1_Zone1_Wall_5_0_0_0_0_0_Win_WindSpeed Sensor
Added - Block1_Zone1_Wall_5_0_0_0_0_0_Win_OutT Sensor
Added - OutT Sensor
Added - AHST_Act_BLOCK1_ZONE2 Actuator
Added - ACST_Act_BLOCK1_ZONE2 Actuator
Added - AHST_Act_BLOCK1_ZONE1 Actuator
Added - ACST_Act_BLOCK1_ZONE1 Actuator
Added - Block1_Zone2_Wall_3_0_0_0_0_0_Win_VentOpenFact Actuator
Added - Block1_Zone2_Wall_4_0_0_0_0_0_Win_VentOpenFact Actuator
Added - Block1_Zone2_Wall_5_0_0_0_0_0_Win_VentOpenFact Actuator
Added - Block1_Zone1_Wall_2_0_0_0_0_0_Win_VentOpenFact Actuator
Added - Block1_Zone1_Wall_3_0_0_0_0_0_Win_VentOpenFact Actuator
Added - Block1_Zone1_Wall_5_0_0_0_0_0_Win_VentOpenFact Actuator
Added - BLOCK1_ZONE2_CoolCoil Sensor
Added - BLOCK1_ZONE2_HeatCoil Sensor
Added - BLOCK1_ZONE1_CoolCoil Sensor
Added - BLOCK1_ZONE1_HeatCoil Sensor
Added - Block1_Zone2_Wall_3_0_0_0_0_0_Win_CoolCoil Sensor
Added - Block1_Zone2_Wall_3_0_0_0_0_0_Win_HeatCoil Sensor
Added - Block1_Zone2_Wall_4_0_0_0_0_0_Win_CoolCoil Sensor
Added - Block1_Zone2_Wall_4_0_0_0_0_0_Win_HeatCoil Sensor
Added - Block1_Zone2_Wall_5_0_0_0_0_0_Win_CoolCoil Sensor
Added - Block1_Zone2_Wall_5_0_0_0_0_0_Win_HeatCoil Sensor
Added - Block1_Zone1_Wall_2_0_0_0_0_0_Win_CoolCoil Sensor
Added - Block1_Zone1_Wall_2_0_0_0_0_0_Win_HeatCoil Sensor
Added - Block1_Zone1_Wall_3_0_0_0_0_0_Win_CoolCoil Sensor
Added - Block1_Zone1_Wall_3_0_0_0_0_0_Win_HeatCoil Sensor
Added - Block1_Zone1_Wall_5_0_0_0_0_0_Win_CoolCoil Sensor
Added - Block1_Zone1_Wall_5_0_0_0_0_0_Win_HeatCoil Sensor
Added - SetComfTemp Program Calling Manager
Added - CountHours_BLOCK1_ZONE2 Program Calling Manager
Added - CountHours_BLOCK1_ZONE1 Program Calling Manager
Added - SetAppLimits Program Calling Manager
Added - ApplyCAT Program Calling Manager
Added - SetAST Program Calling Manager
Added - SetASTnoTol Program Calling Manager
Added - CountHoursNoApp_BLOCK1_ZONE2 Program Calling Manager
Added - SetGeoVarBLOCK1_ZONE2 Program Calling Manager
Added - CountHoursNoApp_BLOCK1_ZONE1 Program Calling Manager
Added - SetGeoVarBLOCK1_ZONE1 Program Calling Manager
Added - SetInputData Program Calling Manager
Added - SetVOFinputData Program Calling Manager
Added - SetVST Program Calling Manager
Added - ApplyAST_BLOCK1_ZONE2 Program Calling Manager
Added - ApplyAST_BLOCK1_ZONE1 Program Calling Manager
Added - SetMyVOF_Block1_Zone2_Wall_3_0_0_0_0_0_Win Program Calling Manager
Added - SetWindowOperation_Block1_Zone2_Wall_3_0_0_0_0_0_Win Program Calling Manager
```

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```
Added - SetMyVOF_Block1_Zone2_Wall_4_0_0_0_0_0_Win Program Calling Manager
Added - SetWindowOperation_Block1_Zone2_Wall_4_0_0_0_0_0_Win Program Calling Manager
Added - SetMyVOF_Block1_Zone2_Wall_5_0_0_0_0_0_Win Program Calling Manager
Added - SetWindowOperation_Block1_Zone2_Wall_5_0_0_0_0_0_Win Program Calling Manager
Added - SetMyVOF_Block1_Zone1_Wall_2_0_0_0_0_0_Win Program Calling Manager
Added - SetWindowOperation_Block1_Zone1_Wall_2_0_0_0_0_0_Win Program Calling Manager
Added - SetMyVOF_Block1_Zone1_Wall_3_0_0_0_0_0_Win Program Calling Manager
Added - SetWindowOperation_Block1_Zone1_Wall_3_0_0_0_0_0_Win Program Calling Manager
Added - SetMyVOF_Block1_Zone1_Wall_5_0_0_0_0_0_Win Program Calling Manager
Added - SetWindowOperation_Block1_Zone1_Wall_5_0_0_0_0_0_Win Program Calling Manager
Added - Comfort Temperature Reporting FrequencyHourly Output:Variable data
Added - Adaptive Cooling Setpoint Temperature Reporting FrequencyHourly Output:Variable␣
↪data
Added - Adaptive Heating Setpoint Temperature Reporting FrequencyHourly Output:Variable␣
↪data
Added - Adaptive Cooling Setpoint Temperature_No Tolerance Reporting FrequencyHourly␣
↪Output:Variable data
Added - Adaptive Heating Setpoint Temperature_No Tolerance Reporting FrequencyHourly␣
↪Output:Variable data
Added - Ventilation Setpoint Temperature Reporting FrequencyHourly Output:Variable data
Added - Minimum Outdoor Temperature for ventilation Reporting FrequencyHourly Output:
↪Variable data
Added - Minimum Outdoor Temperature Difference for ventilation Reporting FrequencyHourly␣
↪Output:Variable data
Added - Maximum Outdoor Temperature Difference for ventilation Reporting FrequencyHourly␣
↪Output:Variable data
Added - Multiplier for Ventilation Opening Factor Reporting FrequencyHourly Output:
↪Variable data
Added - Comfortable Hours_No Applicability_BLOCK1_ZONE2 Reporting FrequencyHourly Output:
↪Variable data
Added - Comfortable Hours_No Applicability_BLOCK1_ZONE1 Reporting FrequencyHourly Output:
↪Variable data
Added - Comfortable Hours_Applicability_BLOCK1_ZONE2 Reporting FrequencyHourly Output:
↪Variable data
Added - Comfortable Hours_Applicability_BLOCK1_ZONE1 Reporting FrequencyHourly Output:
↪Variable data
Added - Discomfortable Applicable Hot Hours_BLOCK1_ZONE2 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Applicable Hot Hours_BLOCK1_ZONE1 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Applicable Cold Hours_BLOCK1_ZONE2 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Applicable Cold Hours_BLOCK1_ZONE1 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE2 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE1 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE2 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE1 Reporting FrequencyHourly␣
↪Output:Variable data
```

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```
Added - Zone Floor Area_BLOCK1_ZONE2 Reporting FrequencyHourly Output:Variable data
Added - Zone Floor Area_BLOCK1_ZONE1 Reporting FrequencyHourly Output:Variable data
Added - Zone Air Volume_BLOCK1_ZONE2 Reporting FrequencyHourly Output:Variable data
Added - Zone Air Volume_BLOCK1_ZONE1 Reporting FrequencyHourly Output:Variable data
Added - Ventilation Hours_BLOCK1_ZONE2 Reporting FrequencyHourly Output:Variable data
Added - Ventilation Hours_BLOCK1_ZONE1 Reporting FrequencyHourly Output:Variable data
Added - Zone Operative Temperature Reporting FrequencyHourly Output:Variable data
Added - Zone Thermal Comfort CEN 15251 Adaptive Model Running Average Outdoor Air␣
↪Temperature Reporting FrequencyHourly Output:Variable data
Added - Zone Thermal Comfort ASHRAE 55 Adaptive Model Running Average Outdoor Air␣
↪Temperature Reporting FrequencyHourly Output:Variable data
Added - Cooling Coil Total Cooling Rate Reporting FrequencyHourly Output:Variable data
Added - Heating Coil Heating Rate Reporting FrequencyHourly Output:Variable data
Added - Facility Total HVAC Electric Demand Power Reporting FrequencyHourly Output:
↪Variable data
Added - Facility Total HVAC Electricity Demand Rate Reporting FrequencyHourly Output:
↪Variable data
Added - AFN Surface Venting Window or Door Opening Factor Reporting FrequencyHourly␣
↪Output:Variable data
Added - AFN Zone Infiltration Air Change Rate Reporting FrequencyHourly Output:Variable␣
↪data
Added - AFN Zone Infiltration Volume Reporting FrequencyHourly Output:Variable data
Added - AFN Zone Ventilation Air Change Rate Reporting FrequencyHourly Output:Variable␣
↪data
Added - AFN Zone Ventilation Volume Reporting FrequencyHourly Output:Variable data
Added - Site Outdoor Air Drybulb Temperature Reporting FrequencyHourly Output:Variable␣
↪data
Added - Site Wind Speed Reporting FrequencyHourly Output:Variable data
Added - Site Outdoor Air Relative Humidity Reporting FrequencyHourly Output:Variable data
Added - AHST_Sch_BLOCK1_ZONE2 Reporting FrequencyHourly Output:Variable data
Added - ACST_Sch_BLOCK1_ZONE2 Reporting FrequencyHourly Output:Variable data
Added - AHST_Sch_BLOCK1_ZONE1 Reporting FrequencyHourly Output:Variable data
Added - ACST_Sch_BLOCK1_ZONE1 Reporting FrequencyHourly Output:Variable data
Added - VRF Heat Pump Cooling Electricity Energy Reporting FrequencyHourly Output:
↪Variable data
Added - VRF Heat Pump Heating Electricity Energy Reporting FrequencyHourly Output:
↪Variable data
Added - BLOCK1_ZONE2 VRF Indoor Unit DX Cooling Coil Reporting FrequencyHourly Output:
↪Variable data
Added - BLOCK1_ZONE2 VRF Indoor Unit DX Heating Coil Reporting Frequency Hourly Output:
↪Variable data
Added - BLOCK1_ZONE1 VRF Indoor Unit DX Cooling Coil Reporting FrequencyHourly Output:
↪Variable data
Added - BLOCK1_ZONE1 VRF Indoor Unit DX Heating Coil Reporting Frequency Hourly Output:
↪Variable data
Added - Comfort Temperature Reporting FrequencyRunperiod Output:Variable data
Added - Adaptive Cooling Setpoint Temperature Reporting FrequencyRunperiod Output:
↪Variable data
Added - Adaptive Heating Setpoint Temperature Reporting FrequencyRunperiod Output:
↪Variable data
Added - Adaptive Cooling Setpoint Temperature_No Tolerance Reporting FrequencyRunperiod␣
↪Output:Variable data
```

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```
Added - Adaptive Heating Setpoint Temperature_No Tolerance Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Ventilation Setpoint Temperature Reporting FrequencyRunperiod Output:Variable␣
↪data
Added - Minimum Outdoor Temperature for ventilation Reporting FrequencyRunperiod Output:
↪Variable data
Added - Minimum Outdoor Temperature Difference for ventilation Reporting␣
↪FrequencyRunperiod Output:Variable data
Added - Maximum Outdoor Temperature Difference for ventilation Reporting␣
↪FrequencyRunperiod Output:Variable data
Added - Multiplier for Ventilation Opening Factor Reporting FrequencyRunperiod Output:
↪Variable data
Added - Comfortable Hours_No Applicability_BLOCK1_ZONE2 Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Comfortable Hours_No Applicability_BLOCK1_ZONE1 Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Comfortable Hours_Applicability_BLOCK1_ZONE2 Reporting FrequencyRunperiod Output:
↪Variable data
Added - Comfortable Hours_Applicability_BLOCK1_ZONE1 Reporting FrequencyRunperiod Output:
↪Variable data
Added - Discomfortable Applicable Hot Hours_BLOCK1_ZONE2 Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Discomfortable Applicable Hot Hours_BLOCK1_ZONE1 Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Discomfortable Applicable Cold Hours_BLOCK1_ZONE2 Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Discomfortable Applicable Cold Hours_BLOCK1_ZONE1 Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE2 Reporting␣
↪FrequencyRunperiod Output:Variable data
Added - Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE1 Reporting␣
↪FrequencyRunperiod Output:Variable data
Added - Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE2 Reporting␣
↪FrequencyRunperiod Output:Variable data
Added - Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE1 Reporting␣
↪FrequencyRunperiod Output:Variable data
Added - Zone Floor Area_BLOCK1_ZONE2 Reporting FrequencyRunperiod Output:Variable data
Added - Zone Floor Area_BLOCK1_ZONE1 Reporting FrequencyRunperiod Output:Variable data
Added - Zone Air Volume_BLOCK1_ZONE2 Reporting FrequencyRunperiod Output:Variable data
Added - Zone Air Volume_BLOCK1_ZONE1 Reporting FrequencyRunperiod Output:Variable data
Added - Ventilation Hours_BLOCK1_ZONE2 Reporting FrequencyRunperiod Output:Variable data
Added - Ventilation Hours_BLOCK1_ZONE1 Reporting FrequencyRunperiod Output:Variable data
Added - Zone Operative Temperature Reporting FrequencyRunperiod Output:Variable data
Added - Zone Thermal Comfort CEN 15251 Adaptive Model Running Average Outdoor Air␣
↪Temperature Reporting FrequencyRunperiod Output:Variable data
Added - Zone Thermal Comfort ASHRAE 55 Adaptive Model Running Average Outdoor Air␣
↪Temperature Reporting FrequencyRunperiod Output:Variable data
Added - Cooling Coil Total Cooling Rate Reporting FrequencyRunperiod Output:Variable data
Added - Heating Coil Heating Rate Reporting FrequencyRunperiod Output:Variable data
Added - Facility Total HVAC Electric Demand Power Reporting FrequencyRunperiod Output:
↪Variable data
Added - Facility Total HVAC Electricity Demand Rate Reporting FrequencyRunperiod Output:
```

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```
↪Variable data
Added - AFN Surface Venting Window or Door Opening Factor Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - AFN Zone Infiltration Air Change Rate Reporting FrequencyRunperiod Output:
↪Variable data
Added - AFN Zone Infiltration Volume Reporting FrequencyRunperiod Output:Variable data
Added - AFN Zone Ventilation Air Change Rate Reporting FrequencyRunperiod Output:
↪Variable data
Added - AFN Zone Ventilation Volume Reporting FrequencyRunperiod Output:Variable data
Added - Site Outdoor Air Drybulb Temperature Reporting FrequencyRunperiod Output:
↪Variable data
Added - Site Wind Speed Reporting FrequencyRunperiod Output:Variable data
Added - Site Outdoor Air Relative Humidity Reporting FrequencyRunperiod Output:Variable␣
↪data
Added - AHST_Sch_BLOCK1_ZONE2 Reporting FrequencyRunperiod Output:Variable data
Added - ACST_Sch_BLOCK1_ZONE2 Reporting FrequencyRunperiod Output:Variable data
Added - AHST_Sch_BLOCK1_ZONE1 Reporting FrequencyRunperiod Output:Variable data
Added - ACST_Sch_BLOCK1_ZONE1 Reporting FrequencyRunperiod Output:Variable data
Added - VRF Heat Pump Cooling Electricity Energy Reporting FrequencyRunperiod Output:
↪Variable data
Added - VRF Heat Pump Heating Electricity Energy Reporting FrequencyRunperiod Output:
↪Variable data
Added - BLOCK1_ZONE2 VRF Indoor Unit DX Cooling Coil Reporting FrequencyRunperiod Output:
↪Variable data
Added - BLOCK1_ZONE2 VRF Indoor Unit DX Heating Coil Reporting Frequency Runperiod␣
↪Output:Variable data
Added - BLOCK1_ZONE1 VRF Indoor Unit DX Cooling Coil Reporting FrequencyRunperiod Output:
↪Variable data
Added - BLOCK1_ZONE1 VRF Indoor Unit DX Heating Coil Reporting Frequency Runperiod␣
↪Output:Variable data
IDF has been saved
Ending with file:
TestModel

=======================END OF GENERIC IDF FILE GENERATION PROCESS=======================

The following IDFs will not work, and therefore these will be deleted:
None

=======================START OF OUTPUT IDF FILES GENERATION␣
↪PROCESS=======================

The list of output IDFs is going to be:
TestModel[CS_INT EN16798[CA_1[CM_0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_1[CM_1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_1[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_1[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
```

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```
TestModel[CS_INT EN16798[CA_3[CM_1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
And the total number of output IDFs is going to be 36
IDF generation has been shut down

=======================END OF OUTPUT IDF FILES GENERATION PROCESS=======================
```

We can see no output idf has been generated:

[32]:
```
[i for i in listdir() if i.endswith('.idf')]
```

[32]:
```
['TestModel.idf']
```

However, in this case, there is a variable within `add_accis_instance` named `df_outputs`, which is a pandas DataFrame that contains all Output:Variable objects. Let's take a look:

[33]:
```
add_accis_instance.df_outputs
```

[33]:

	file	key_value	\
0	TestModel	*	
1	TestModel	*	
2	TestModel	*	
3	TestModel	*	
4	TestModel	*	
..	...	...	
101	TestModel	*	
102	TestModel	BLOCK1_ZONE2 VRF Indoor Unit DX Cooling Coil	

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```
103  TestModel  BLOCK1_ZONE2 VRF Indoor Unit DX Heating Coil
104  TestModel  BLOCK1_ZONE1 VRF Indoor Unit DX Cooling Coil
105  TestModel  BLOCK1_ZONE1 VRF Indoor Unit DX Heating Coil

                                      variable_name reporting_frequency  \
0                                 Comfort Temperature              Hourly
1                 Adaptive Cooling Setpoint Temperature              Hourly
2                 Adaptive Heating Setpoint Temperature              Hourly
3    Adaptive Cooling Setpoint Temperature_No Toler...              Hourly
4    Adaptive Heating Setpoint Temperature_No Toler...              Hourly
..                                                 ...                 ...
101           VRF Heat Pump Heating Electricity Energy           Runperiod
102                    Cooling Coil Total Cooling Rate           Runperiod
103                          Heating Coil Heating Rate           Runperiod
104                    Cooling Coil Total Cooling Rate           Runperiod
105                          Heating Coil Heating Rate           Runperiod

    schedule_name
0
1
2
3
4
..            ...
101
102
103
104
105

[106 rows x 5 columns]
```

Now, let's save it in a new variable, and let's filter it to keep only the Output:Variable objects we need.

[34]:
```
df_outputs_in = add_accis_instance.df_outputs
df_outputs_in = df_outputs_in[
    (
        df_outputs_in['variable_name'].str.contains('Zone Operative Temperature')
        |
        df_outputs_in['variable_name'].str.contains('Adaptive Cooling Setpoint␣
↪Temperature_No Tolerance')
        |
        df_outputs_in['variable_name'].str.contains('Adaptive Heating Setpoint␣
↪Temperature_No Tolerance')
    )
]
df_outputs_in
```

[34]:
```
         file key_value                                      variable_name  \
3   TestModel         *  Adaptive Cooling Setpoint Temperature_No Toler...
4   TestModel         *  Adaptive Heating Setpoint Temperature_No Toler...
28  TestModel         *                          Zone Operative Temperature
```

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```
56  TestModel         *  Adaptive Cooling Setpoint Temperature_No Toler...
57  TestModel         *  Adaptive Heating Setpoint Temperature_No Toler...
81  TestModel         *                          Zone Operative Temperature

   reporting_frequency schedule_name
3               Hourly
4               Hourly
28              Hourly
56           Runperiod
57           Runperiod
81           Runperiod
```

Now, we can run again `addAccis`, specifying `Output_gen_dataframe=False`, entering the pandas DataFrame instance `df_outputs_in` we just filtered in the argument `Output_take_dataframe`, and specifying `confirmGen=True`, since now we're ready to apply the adaptive setpoints.

[35]:
```
from accim.sim import accis
add_accis_instance = accis.addAccis(
    ScriptType='vrf_mm',
    SupplyAirTempInputMethod='temperature difference',
    Output_keep_existing=False,
    Output_type='standard',
    Output_freqs=['hourly', 'runperiod'],
    Output_gen_dataframe=False,
    Output_take_dataframe=df_outputs_in,
    EnergyPlus_version='23.1',
    TempCtrl='temperature',
    ComfStand=[1, 14],
    CAT=[1, 2, 3, 80, 90],
    ComfMod=[0, 0.1, 0.2, 0.3, 0.4, 0.5, 1, 1.1, 1.2, 1.3, 1.4, 1.5, 2, 3],
    SetpointAcc=100,
    CoolSeasonStart='01/11',
    CoolSeasonEnd='01/03',
    HVACmode=[2],
    VentCtrl=[2],
    MaxTempDiffVOF=20,
    MinTempDiffVOF=1,
    MultiplierVOF=0.2,
    VSToffset=[0],
    MinOToffset=[50],
    MaxWindSpeed=[50],
    ASTtol_steps=0.1,
    ASTtol_start=0.1,
    ASTtol_end_input=0.1,
    confirmGen=True
)
```

```
-----------------------------------------------------------
Adaptive-Comfort-Control-Implemented Model (ACCIM) v0.7.0
-----------------------------------------------------------

This tool allows to apply adaptive setpoint temperatures.
```

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```
For further information, please read the documentation:
https://accim.readthedocs.io/en/master/
For a visual understanding of the tool, please visit the following jupyter notebooks:
-    Using addAccis() to apply adaptive setpoint temperatures
https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_
↪notebooks/addAccis/using_addAccis.ipynb
-    Using rename_epw_files() to rename the EPWs for proper data analysis after␣
↪simulation
https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_
↪notebooks/rename_epw_files/using_rename_epw_files.ipynb
-    Using runEp() to directly run simulations with EnergyPlus
https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_
↪notebooks/runEp/using_runEp.ipynb
-    Using the class Table() for data analysis
https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_
↪notebooks/Table/using_Table.ipynb
-    Full example
https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_
↪notebooks/Table/using_Table.ipynb

Starting with the process.
Basic input data:
ScriptType is: vrf_mm
Supply Air Temperature Input Method is: temperature difference
Output type is: standard
Output frequencies are:
['hourly', 'runperiod']
EnergyPlus version is: 23.1
Temperature Control method is: temperature

=======================START OF GENERIC IDF FILE GENERATION␣
↪PROCESS=======================

Starting with file:
TestModel
IDD location is: C:\EnergyPlusV23-1-0\Energy+.idd
The occupied zones in the model TestModel are:
BLOCK1:ZONE2
BLOCK1:ZONE1
The windows and doors in the model TestModel are:
Block1_Zone2_Wall_3_0_0_0_0_0_Win
Block1_Zone2_Wall_4_0_0_0_0_0_Win
Block1_Zone2_Wall_5_0_0_0_0_0_Win
Block1_Zone1_Wall_2_0_0_0_0_0_Win
Block1_Zone1_Wall_3_0_0_0_0_0_Win
Block1_Zone1_Wall_5_0_0_0_0_0_Win
The zones in the model TestModel are:
BLOCK1_ZONE2
BLOCK1_ZONE1
The people objects in the model have been amended.
BLOCK1:ZONE2 Thermostat has been added
BLOCK1:ZONE1 Thermostat has been added
```

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```
On Schedule already was in the model
TypOperativeTempControlSch Schedule already was in the model
All ZoneHVAC:IdealLoadsAirSystem Heating and Cooling availability schedules has been set␣
↪to on
On 24/7 Schedule already was in the model
Control type schedule: Always 4 Schedule has been added
Relative humidity setpoint schedule: Always 50.00 Schedule has been added
Heating Fanger comfort setpoint: Always -0.5 Schedule has been added
Cooling Fanger comfort setpoint: Always  0.1 Schedule has been added
Zone CO2 setpoint: Always 900ppm Schedule has been added
Min CO2 concentration: Always 600ppm Schedule has been added
Generic contaminant setpoint: Always 0.5ppm Schedule has been added
Air distribution effectiveness (always 1) Schedule has been added
VRF Heating Cooling (Northern Hemisphere) Schedule has been added
DefaultFanEffRatioCurve Curve:Cubic Object has been added
VRFTUCoolCapFT Curve:Cubic Object has been added
VRFTUHeatCapFT Curve:Cubic Object has been added
VRFCoolCapFTBoundary Curve:Cubic Object has been added
VRFCoolEIRFTBoundary Curve:Cubic Object has been added
CoolingEIRLowPLR Curve:Cubic Object has been added
VRFHeatCapFTBoundary Curve:Cubic Object has been added
VRFHeatEIRFTBoundary Curve:Cubic Object has been added
HeatingEIRLowPLR Curve:Cubic Object has been added
DefaultFanPowerRatioCurve Curve:Exponent Object has been added
DXHtgCoilDefrostEIRFT Curve:Biquadratic Object has been added
VRFCoolCapFT Curve:Biquadratic Object has been added
VRFCoolCapFTHi Curve:Biquadratic Object has been added
VRFCoolEIRFT Curve:Biquadratic Object has been added
VRFCoolEIRFTHi Curve:Biquadratic Object has been added
VRFHeatCapFT Curve:Biquadratic Object has been added
VRFHeatCapFTHi Curve:Biquadratic Object has been added
VRFHeatEIRFT Curve:Biquadratic Object has been added
VRFHeatEIRFTHi Curve:Biquadratic Object has been added
CoolingLengthCorrectionFactor Curve:Biquadratic Object has been added
VRF Piping Correction Factor for Length in Heating Mode Curve:Biquadratic Object has␣
↪been added
VRF Heat Recovery Cooling Capacity Modifier Curve:Biquadratic Object has been added
VRF Heat Recovery Cooling Energy Modifier Curve:Biquadratic Object has been added
VRF Heat Recovery Heating Capacity Modifier Curve:Biquadratic Object has been added
VRF Heat Recovery Heating Energy Modifier Curve:Biquadratic Object has been added
VRFACCoolCapFFF Curve:Quadratic Object has been added
CoolingEIRHiPLR Curve:Quadratic Object has been added
VRFCPLFFPLR Curve:Quadratic Object has been added
HeatingEIRHiPLR Curve:Quadratic Object has been added
CoolingCombRatio Curve:Linear Object has been added
HeatingCombRatio Curve:Linear Object has been added
VRF Outdoor Unit_BLOCK1:ZONE2 AirConditioner:VariableRefrigerantFlow Object has been␣
↪added
VRF Outdoor Unit_BLOCK1:ZONE1 AirConditioner:VariableRefrigerantFlow Object has been␣
↪added
VRF Outdoor Unit_BLOCK1:ZONE2 Outdoor Air Node Object has been added
VRF Outdoor Unit_BLOCK1:ZONE2 Zone List Object has been added
```

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```
VRF Outdoor Unit_BLOCK1:ZONE1 Outdoor Air Node Object has been added
VRF Outdoor Unit_BLOCK1:ZONE1 Zone List Object has been added
BLOCK1:ZONE2 Sizing:Zone Object has been added
BLOCK1:ZONE1 Sizing:Zone Object has been added
BLOCK1:ZONE2 Design Specification Outdoor Air Object has been added
BLOCK1:ZONE1 Design Specification Outdoor Air Object has been added
BLOCK1:ZONE2 Design Specification Zone Air Distribution Object has been added
BLOCK1:ZONE1 Design Specification Zone Air Distribution Object has been added
BLOCK1:ZONE2 Nodelist Objects has been added
BLOCK1:ZONE1 Nodelist Objects has been added
BLOCK1:ZONE2 ZoneHVAC:EquipmentConnections Objects has been added
BLOCK1:ZONE1 ZoneHVAC:EquipmentConnections Objects has been added
BLOCK1:ZONE2 ZoneHVAC:EquipmentList Objects has been added
BLOCK1:ZONE1 ZoneHVAC:EquipmentList Objects has been added
BLOCK1:ZONE2 ZoneHVAC:TerminalUnit:VariableRefrigerantFlow Object has been added
BLOCK1:ZONE1 ZoneHVAC:TerminalUnit:VariableRefrigerantFlow Object has been added
BLOCK1:ZONE2 Coil:Cooling:DX:VariableRefrigerantFlow Object has been added
BLOCK1:ZONE1 Coil:Cooling:DX:VariableRefrigerantFlow Object has been added
BLOCK1:ZONE2 Coil:Heating:DX:VariableRefrigerantFlow Object has been added
BLOCK1:ZONE1 Coil:Heating:DX:VariableRefrigerantFlow Object has been added
BLOCK1:ZONE2 Fan:ConstantVolume Object has been added
BLOCK1:ZONE1 Fan:ConstantVolume Object has been added
Vent_SP_temp Schedule has been added
AHST_Sch_BLOCK1_ZONE2 Schedule has been added
ACST_Sch_BLOCK1_ZONE2 Schedule has been added
AHST_Sch_BLOCK1_ZONE1 Schedule has been added
ACST_Sch_BLOCK1_ZONE1 Schedule has been added
Added - SetComfTemp Program
Added - CountHours_BLOCK1_ZONE2 Program
Added - CountHours_BLOCK1_ZONE1 Program
Added - SetAppLimits Program
Added - ApplyCAT Program
Added - SetAST Program
Added - SetASTnoTol Program
Added - CountHoursNoApp_BLOCK1_ZONE2 Program
Added - SetGeoVarBLOCK1_ZONE2 Program
Added - CountHoursNoApp_BLOCK1_ZONE1 Program
Added - SetGeoVarBLOCK1_ZONE1 Program
Added - SetInputData Program
Added - SetVOFinputData Program
Added - SetVST Program
Added - ApplyAST_BLOCK1_ZONE2 Program
Added - ApplyAST_BLOCK1_ZONE1 Program
Added - SetMyVOF_Block1_Zone2_Wall_3_0_0_0_0_0_Win Program
Added - SetWindowOperation_Block1_Zone2_Wall_3_0_0_0_0_0_Win Program
Added - SetMyVOF_Block1_Zone2_Wall_4_0_0_0_0_0_Win Program
Added - SetWindowOperation_Block1_Zone2_Wall_4_0_0_0_0_0_Win Program
Added - SetMyVOF_Block1_Zone2_Wall_5_0_0_0_0_0_Win Program
Added - SetWindowOperation_Block1_Zone2_Wall_5_0_0_0_0_0_Win Program
Added - SetMyVOF_Block1_Zone1_Wall_2_0_0_0_0_0_Win Program
Added - SetWindowOperation_Block1_Zone1_Wall_2_0_0_0_0_0_Win Program
Added - SetMyVOF_Block1_Zone1_Wall_3_0_0_0_0_0_Win Program
```

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```
Added - SetWindowOperation_Block1_Zone1_Wall_3_0_0_0_0_0_Win Program
Added - SetMyVOF_Block1_Zone1_Wall_5_0_0_0_0_0_Win Program
Added - SetWindowOperation_Block1_Zone1_Wall_5_0_0_0_0_0_Win Program
Added - Comfort Temperature Output Variable
Added - Adaptive Cooling Setpoint Temperature Output Variable
Added - Adaptive Heating Setpoint Temperature Output Variable
Added - Adaptive Cooling Setpoint Temperature_No Tolerance Output Variable
Added - Adaptive Heating Setpoint Temperature_No Tolerance Output Variable
Added - Ventilation Setpoint Temperature Output Variable
Added - Minimum Outdoor Temperature for ventilation Output Variable
Added - Minimum Outdoor Temperature Difference for ventilation Output Variable
Added - Maximum Outdoor Temperature Difference for ventilation Output Variable
Added - Multiplier for Ventilation Opening Factor Output Variable
Added - Comfortable Hours_No Applicability_BLOCK1_ZONE2 Output Variable
Added - Comfortable Hours_No Applicability_BLOCK1_ZONE1 Output Variable
Added - Comfortable Hours_Applicability_BLOCK1_ZONE2 Output Variable
Added - Comfortable Hours_Applicability_BLOCK1_ZONE1 Output Variable
Added - Discomfortable Applicable Hot Hours_BLOCK1_ZONE2 Output Variable
Added - Discomfortable Applicable Hot Hours_BLOCK1_ZONE1 Output Variable
Added - Discomfortable Applicable Cold Hours_BLOCK1_ZONE2 Output Variable
Added - Discomfortable Applicable Cold Hours_BLOCK1_ZONE1 Output Variable
Added - Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE2 Output Variable
Added - Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE1 Output Variable
Added - Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE2 Output Variable
Added - Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE1 Output Variable
Added - Zone Floor Area_BLOCK1_ZONE2 Output Variable
Added - Zone Floor Area_BLOCK1_ZONE1 Output Variable
Added - Zone Air Volume_BLOCK1_ZONE2 Output Variable
Added - Zone Air Volume_BLOCK1_ZONE1 Output Variable
Added - Ventilation Hours_BLOCK1_ZONE2 Output Variable
Added - Ventilation Hours_BLOCK1_ZONE1 Output Variable
Global variables objects have been added
Internal variables objects have been added
Added - RMOT Sensor
Added - PMOT Sensor
Added - BLOCK1_ZONE2_OpT Sensor
Added - BLOCK1_ZONE2_WindSpeed Sensor
Added - BLOCK1_ZONE2_OutT Sensor
Added - BLOCK1_ZONE1_OpT Sensor
Added - BLOCK1_ZONE1_WindSpeed Sensor
Added - BLOCK1_ZONE1_OutT Sensor
Added - Block1_Zone2_Wall_3_0_0_0_0_0_Win_OpT Sensor
Added - Block1_Zone2_Wall_3_0_0_0_0_0_Win_WindSpeed Sensor
Added - Block1_Zone2_Wall_3_0_0_0_0_0_Win_OutT Sensor
Added - Block1_Zone2_Wall_4_0_0_0_0_0_Win_OpT Sensor
Added - Block1_Zone2_Wall_4_0_0_0_0_0_Win_WindSpeed Sensor
Added - Block1_Zone2_Wall_4_0_0_0_0_0_Win_OutT Sensor
Added - Block1_Zone2_Wall_5_0_0_0_0_0_Win_OpT Sensor
Added - Block1_Zone2_Wall_5_0_0_0_0_0_Win_WindSpeed Sensor
Added - Block1_Zone2_Wall_5_0_0_0_0_0_Win_OutT Sensor
Added - Block1_Zone1_Wall_2_0_0_0_0_0_Win_OpT Sensor
Added - Block1_Zone1_Wall_2_0_0_0_0_0_Win_WindSpeed Sensor
```

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```
Added - Block1_Zone1_Wall_2_0_0_0_0_0_Win_OutT Sensor
Added - Block1_Zone1_Wall_3_0_0_0_0_0_Win_OpT Sensor
Added - Block1_Zone1_Wall_3_0_0_0_0_0_Win_WindSpeed Sensor
Added - Block1_Zone1_Wall_3_0_0_0_0_0_Win_OutT Sensor
Added - Block1_Zone1_Wall_5_0_0_0_0_0_Win_OpT Sensor
Added - Block1_Zone1_Wall_5_0_0_0_0_0_Win_WindSpeed Sensor
Added - Block1_Zone1_Wall_5_0_0_0_0_0_Win_OutT Sensor
Added - OutT Sensor
Added - AHST_Act_BLOCK1_ZONE2 Actuator
Added - ACST_Act_BLOCK1_ZONE2 Actuator
Added - AHST_Act_BLOCK1_ZONE1 Actuator
Added - ACST_Act_BLOCK1_ZONE1 Actuator
Added - Block1_Zone2_Wall_3_0_0_0_0_0_Win_VentOpenFact Actuator
Added - Block1_Zone2_Wall_4_0_0_0_0_0_Win_VentOpenFact Actuator
Added - Block1_Zone2_Wall_5_0_0_0_0_0_Win_VentOpenFact Actuator
Added - Block1_Zone1_Wall_2_0_0_0_0_0_Win_VentOpenFact Actuator
Added - Block1_Zone1_Wall_3_0_0_0_0_0_Win_VentOpenFact Actuator
Added - Block1_Zone1_Wall_5_0_0_0_0_0_Win_VentOpenFact Actuator
Added - BLOCK1_ZONE2_CoolCoil Sensor
Added - BLOCK1_ZONE2_HeatCoil Sensor
Added - BLOCK1_ZONE1_CoolCoil Sensor
Added - BLOCK1_ZONE1_HeatCoil Sensor
Added - Block1_Zone2_Wall_3_0_0_0_0_0_Win_CoolCoil Sensor
Added - Block1_Zone2_Wall_3_0_0_0_0_0_Win_HeatCoil Sensor
Added - Block1_Zone2_Wall_4_0_0_0_0_0_Win_CoolCoil Sensor
Added - Block1_Zone2_Wall_4_0_0_0_0_0_Win_HeatCoil Sensor
Added - Block1_Zone2_Wall_5_0_0_0_0_0_Win_CoolCoil Sensor
Added - Block1_Zone2_Wall_5_0_0_0_0_0_Win_HeatCoil Sensor
Added - Block1_Zone1_Wall_2_0_0_0_0_0_Win_CoolCoil Sensor
Added - Block1_Zone1_Wall_2_0_0_0_0_0_Win_HeatCoil Sensor
Added - Block1_Zone1_Wall_3_0_0_0_0_0_Win_CoolCoil Sensor
Added - Block1_Zone1_Wall_3_0_0_0_0_0_Win_HeatCoil Sensor
Added - Block1_Zone1_Wall_5_0_0_0_0_0_Win_CoolCoil Sensor
Added - Block1_Zone1_Wall_5_0_0_0_0_0_Win_HeatCoil Sensor
Added - SetComfTemp Program Calling Manager
Added - CountHours_BLOCK1_ZONE2 Program Calling Manager
Added - CountHours_BLOCK1_ZONE1 Program Calling Manager
Added - SetAppLimits Program Calling Manager
Added - ApplyCAT Program Calling Manager
Added - SetAST Program Calling Manager
Added - SetASTnoTol Program Calling Manager
Added - CountHoursNoApp_BLOCK1_ZONE2 Program Calling Manager
Added - SetGeoVarBLOCK1_ZONE2 Program Calling Manager
Added - CountHoursNoApp_BLOCK1_ZONE1 Program Calling Manager
Added - SetGeoVarBLOCK1_ZONE1 Program Calling Manager
Added - SetInputData Program Calling Manager
Added - SetVOFinputData Program Calling Manager
Added - SetVST Program Calling Manager
Added - ApplyAST_BLOCK1_ZONE2 Program Calling Manager
Added - ApplyAST_BLOCK1_ZONE1 Program Calling Manager
Added - SetMyVOF_Block1_Zone2_Wall_3_0_0_0_0_0_Win Program Calling Manager
Added - SetWindowOperation_Block1_Zone2_Wall_3_0_0_0_0_0_Win Program Calling Manager
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```
Added - SetMyVOF_Block1_Zone2_Wall_4_0_0_0_0_0_Win Program Calling Manager
Added - SetWindowOperation_Block1_Zone2_Wall_4_0_0_0_0_0_Win Program Calling Manager
Added - SetMyVOF_Block1_Zone2_Wall_5_0_0_0_0_0_Win Program Calling Manager
Added - SetWindowOperation_Block1_Zone2_Wall_5_0_0_0_0_0_Win Program Calling Manager
Added - SetMyVOF_Block1_Zone1_Wall_2_0_0_0_0_0_Win Program Calling Manager
Added - SetWindowOperation_Block1_Zone1_Wall_2_0_0_0_0_0_Win Program Calling Manager
Added - SetMyVOF_Block1_Zone1_Wall_3_0_0_0_0_0_Win Program Calling Manager
Added - SetWindowOperation_Block1_Zone1_Wall_3_0_0_0_0_0_Win Program Calling Manager
Added - SetMyVOF_Block1_Zone1_Wall_5_0_0_0_0_0_Win Program Calling Manager
Added - SetWindowOperation_Block1_Zone1_Wall_5_0_0_0_0_0_Win Program Calling Manager
Added - Comfort Temperature Reporting FrequencyHourly Output:Variable data
Added - Adaptive Cooling Setpoint Temperature Reporting FrequencyHourly Output:Variable␣
↪data
Added - Adaptive Heating Setpoint Temperature Reporting FrequencyHourly Output:Variable␣
↪data
Added - Adaptive Cooling Setpoint Temperature_No Tolerance Reporting FrequencyHourly␣
↪Output:Variable data
Added - Adaptive Heating Setpoint Temperature_No Tolerance Reporting FrequencyHourly␣
↪Output:Variable data
Added - Ventilation Setpoint Temperature Reporting FrequencyHourly Output:Variable data
Added - Minimum Outdoor Temperature for ventilation Reporting FrequencyHourly Output:
↪Variable data
Added - Minimum Outdoor Temperature Difference for ventilation Reporting FrequencyHourly␣
↪Output:Variable data
Added - Maximum Outdoor Temperature Difference for ventilation Reporting FrequencyHourly␣
↪Output:Variable data
Added - Multiplier for Ventilation Opening Factor Reporting FrequencyHourly Output:
↪Variable data
Added - Comfortable Hours_No Applicability_BLOCK1_ZONE2 Reporting FrequencyHourly Output:
↪Variable data
Added - Comfortable Hours_No Applicability_BLOCK1_ZONE1 Reporting FrequencyHourly Output:
↪Variable data
Added - Comfortable Hours_Applicability_BLOCK1_ZONE2 Reporting FrequencyHourly Output:
↪Variable data
Added - Comfortable Hours_Applicability_BLOCK1_ZONE1 Reporting FrequencyHourly Output:
↪Variable data
Added - Discomfortable Applicable Hot Hours_BLOCK1_ZONE2 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Applicable Hot Hours_BLOCK1_ZONE1 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Applicable Cold Hours_BLOCK1_ZONE2 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Applicable Cold Hours_BLOCK1_ZONE1 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE2 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE1 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE2 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE1 Reporting FrequencyHourly␣
↪Output:Variable data
```

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```
Added - Zone Floor Area_BLOCK1_ZONE2 Reporting FrequencyHourly Output:Variable data
Added - Zone Floor Area_BLOCK1_ZONE1 Reporting FrequencyHourly Output:Variable data
Added - Zone Air Volume_BLOCK1_ZONE2 Reporting FrequencyHourly Output:Variable data
Added - Zone Air Volume_BLOCK1_ZONE1 Reporting FrequencyHourly Output:Variable data
Added - Ventilation Hours_BLOCK1_ZONE2 Reporting FrequencyHourly Output:Variable data
Added - Ventilation Hours_BLOCK1_ZONE1 Reporting FrequencyHourly Output:Variable data
Added - Zone Operative Temperature Reporting FrequencyHourly Output:Variable data
Added - Zone Thermal Comfort CEN 15251 Adaptive Model Running Average Outdoor Air␣
↪Temperature Reporting FrequencyHourly Output:Variable data
Added - Zone Thermal Comfort ASHRAE 55 Adaptive Model Running Average Outdoor Air␣
↪Temperature Reporting FrequencyHourly Output:Variable data
Added - Cooling Coil Total Cooling Rate Reporting FrequencyHourly Output:Variable data
Added - Heating Coil Heating Rate Reporting FrequencyHourly Output:Variable data
Added - Facility Total HVAC Electric Demand Power Reporting FrequencyHourly Output:
↪Variable data
Added - Facility Total HVAC Electricity Demand Rate Reporting FrequencyHourly Output:
↪Variable data
Added - AFN Surface Venting Window or Door Opening Factor Reporting FrequencyHourly␣
↪Output:Variable data
Added - AFN Zone Infiltration Air Change Rate Reporting FrequencyHourly Output:Variable␣
↪data
Added - AFN Zone Infiltration Volume Reporting FrequencyHourly Output:Variable data
Added - AFN Zone Ventilation Air Change Rate Reporting FrequencyHourly Output:Variable␣
↪data
Added - AFN Zone Ventilation Volume Reporting FrequencyHourly Output:Variable data
Added - Site Outdoor Air Drybulb Temperature Reporting FrequencyHourly Output:Variable␣
↪data
Added - Site Wind Speed Reporting FrequencyHourly Output:Variable data
Added - Site Outdoor Air Relative Humidity Reporting FrequencyHourly Output:Variable data
Added - AHST_Sch_BLOCK1_ZONE2 Reporting FrequencyHourly Output:Variable data
Added - ACST_Sch_BLOCK1_ZONE2 Reporting FrequencyHourly Output:Variable data
Added - AHST_Sch_BLOCK1_ZONE1 Reporting FrequencyHourly Output:Variable data
Added - ACST_Sch_BLOCK1_ZONE1 Reporting FrequencyHourly Output:Variable data
Added - VRF Heat Pump Cooling Electricity Energy Reporting FrequencyHourly Output:
↪Variable data
Added - VRF Heat Pump Heating Electricity Energy Reporting FrequencyHourly Output:
↪Variable data
Added - BLOCK1_ZONE2 VRF Indoor Unit DX Cooling Coil Reporting FrequencyHourly Output:
↪Variable data
Added - BLOCK1_ZONE2 VRF Indoor Unit DX Heating Coil Reporting Frequency Hourly Output:
↪Variable data
Added - BLOCK1_ZONE1 VRF Indoor Unit DX Cooling Coil Reporting FrequencyHourly Output:
↪Variable data
Added - BLOCK1_ZONE1 VRF Indoor Unit DX Heating Coil Reporting Frequency Hourly Output:
↪Variable data
Added - Comfort Temperature Reporting FrequencyRunperiod Output:Variable data
Added - Adaptive Cooling Setpoint Temperature Reporting FrequencyRunperiod Output:
↪Variable data
Added - Adaptive Heating Setpoint Temperature Reporting FrequencyRunperiod Output:
↪Variable data
Added - Adaptive Cooling Setpoint Temperature_No Tolerance Reporting FrequencyRunperiod␣
↪Output:Variable data
```

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```
Added - Adaptive Heating Setpoint Temperature_No Tolerance Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Ventilation Setpoint Temperature Reporting FrequencyRunperiod Output:Variable␣
↪data
Added - Minimum Outdoor Temperature for ventilation Reporting FrequencyRunperiod Output:
↪Variable data
Added - Minimum Outdoor Temperature Difference for ventilation Reporting␣
↪FrequencyRunperiod Output:Variable data
Added - Maximum Outdoor Temperature Difference for ventilation Reporting␣
↪FrequencyRunperiod Output:Variable data
Added - Multiplier for Ventilation Opening Factor Reporting FrequencyRunperiod Output:
↪Variable data
Added - Comfortable Hours_No Applicability_BLOCK1_ZONE2 Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Comfortable Hours_No Applicability_BLOCK1_ZONE1 Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Comfortable Hours_Applicability_BLOCK1_ZONE2 Reporting FrequencyRunperiod Output:
↪Variable data
Added - Comfortable Hours_Applicability_BLOCK1_ZONE1 Reporting FrequencyRunperiod Output:
↪Variable data
Added - Discomfortable Applicable Hot Hours_BLOCK1_ZONE2 Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Discomfortable Applicable Hot Hours_BLOCK1_ZONE1 Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Discomfortable Applicable Cold Hours_BLOCK1_ZONE2 Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Discomfortable Applicable Cold Hours_BLOCK1_ZONE1 Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE2 Reporting␣
↪FrequencyRunperiod Output:Variable data
Added - Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE1 Reporting␣
↪FrequencyRunperiod Output:Variable data
Added - Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE2 Reporting␣
↪FrequencyRunperiod Output:Variable data
Added - Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE1 Reporting␣
↪FrequencyRunperiod Output:Variable data
Added - Zone Floor Area_BLOCK1_ZONE2 Reporting FrequencyRunperiod Output:Variable data
Added - Zone Floor Area_BLOCK1_ZONE1 Reporting FrequencyRunperiod Output:Variable data
Added - Zone Air Volume_BLOCK1_ZONE2 Reporting FrequencyRunperiod Output:Variable data
Added - Zone Air Volume_BLOCK1_ZONE1 Reporting FrequencyRunperiod Output:Variable data
Added - Ventilation Hours_BLOCK1_ZONE2 Reporting FrequencyRunperiod Output:Variable data
Added - Ventilation Hours_BLOCK1_ZONE1 Reporting FrequencyRunperiod Output:Variable data
Added - Zone Operative Temperature Reporting FrequencyRunperiod Output:Variable data
Added - Zone Thermal Comfort CEN 15251 Adaptive Model Running Average Outdoor Air␣
↪Temperature Reporting FrequencyRunperiod Output:Variable data
Added - Zone Thermal Comfort ASHRAE 55 Adaptive Model Running Average Outdoor Air␣
↪Temperature Reporting FrequencyRunperiod Output:Variable data
Added - Cooling Coil Total Cooling Rate Reporting FrequencyRunperiod Output:Variable data
Added - Heating Coil Heating Rate Reporting FrequencyRunperiod Output:Variable data
Added - Facility Total HVAC Electric Demand Power Reporting FrequencyRunperiod Output:
↪Variable data
Added - Facility Total HVAC Electricity Demand Rate Reporting FrequencyRunperiod Output:
```

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```
↪Variable data
Added - AFN Surface Venting Window or Door Opening Factor Reporting FrequencyRunperiod␣
↪Output:Variable data
Added - AFN Zone Infiltration Air Change Rate Reporting FrequencyRunperiod Output:
↪Variable data
Added - AFN Zone Infiltration Volume Reporting FrequencyRunperiod Output:Variable data
Added - AFN Zone Ventilation Air Change Rate Reporting FrequencyRunperiod Output:
↪Variable data
Added - AFN Zone Ventilation Volume Reporting FrequencyRunperiod Output:Variable data
Added - Site Outdoor Air Drybulb Temperature Reporting FrequencyRunperiod Output:
↪Variable data
Added - Site Wind Speed Reporting FrequencyRunperiod Output:Variable data
Added - Site Outdoor Air Relative Humidity Reporting FrequencyRunperiod Output:Variable␣
↪data
Added - AHST_Sch_BLOCK1_ZONE2 Reporting FrequencyRunperiod Output:Variable data
Added - ACST_Sch_BLOCK1_ZONE2 Reporting FrequencyRunperiod Output:Variable data
Added - AHST_Sch_BLOCK1_ZONE1 Reporting FrequencyRunperiod Output:Variable data
Added - ACST_Sch_BLOCK1_ZONE1 Reporting FrequencyRunperiod Output:Variable data
Added - VRF Heat Pump Cooling Electricity Energy Reporting FrequencyRunperiod Output:
↪Variable data
Added - VRF Heat Pump Heating Electricity Energy Reporting FrequencyRunperiod Output:
↪Variable data
Added - BLOCK1_ZONE2 VRF Indoor Unit DX Cooling Coil Reporting FrequencyRunperiod Output:
↪Variable data
Added - BLOCK1_ZONE2 VRF Indoor Unit DX Heating Coil Reporting Frequency Runperiod␣
↪Output:Variable data
Added - BLOCK1_ZONE1 VRF Indoor Unit DX Cooling Coil Reporting FrequencyRunperiod Output:
↪Variable data
Added - BLOCK1_ZONE1 VRF Indoor Unit DX Heating Coil Reporting Frequency Runperiod␣
↪Output:Variable data
Added - * Adaptive Cooling Setpoint Temperature_No Tolerance Output:Variable data
Added - * Adaptive Heating Setpoint Temperature_No Tolerance Output:Variable data
Added - * Zone Operative Temperature Output:Variable data
Added - * Adaptive Cooling Setpoint Temperature_No Tolerance Output:Variable data
Added - * Adaptive Heating Setpoint Temperature_No Tolerance Output:Variable data
Added - * Zone Operative Temperature Output:Variable data
IDF has been saved
Ending with file:
TestModel

=======================END OF GENERIC IDF FILE GENERATION PROCESS=======================

The following IDFs will not work, and therefore these will be deleted:
None

=======================START OF OUTPUT IDF FILES GENERATION␣
↪PROCESS=======================

The list of output IDFs is going to be:
TestModel[CS_INT EN16798[CA_1[CM_0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_1[CM_1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_1[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
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```
TestModel[CS_INT EN16798[CA_1[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
And the total number of output IDFs is going to be 36
Generating the following output IDF files:
TestModel[CS_INT EN16798[CA_1[CM_0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_1[CM_1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_1[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_1[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_2[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT EN16798[CA_3[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_0.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
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TestModel[CS_AUS DeDear[CA_80[CM_1.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_1.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_80[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_0.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.1[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.4[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_1.5[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_2[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_AUS DeDear[CA_90[CM_3[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf

======================END OF OUTPUT IDF FILES GENERATION PROCESS=======================
```

Now, let's inspect the Output:Variable objects in both the input idf and any of the output idfs, for instance, the first one.

[36]:
```
input_testmodel = add_accis_instance.input_idfs['TestModel']
input_testmodel.idfobjects['Output:Variable']
```

[36]:
```
[]
```

We can see there is no Output:Variable object in the input idf. Now let's see some output idf.

[37]:
```
output_testmodel = add_accis_instance.output_idfs[
    'TestModel[CS_INT EN16798[CA_1[CM_0[HM_2[VC_2[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf'
]
output_testmodel.idfobjects['Output:Variable']
```

[37]:
```
[
OUTPUT:VARIABLE,
    *,                          !- Key Value
    Adaptive Cooling Setpoint Temperature_No Tolerance,    !- Variable Name
    Hourly,                     !- Reporting Frequency
    ;                           !- Schedule Name
,
OUTPUT:VARIABLE,
    *,                          !- Key Value
    Adaptive Heating Setpoint Temperature_No Tolerance,    !- Variable Name
    Hourly,                     !- Reporting Frequency
    ;                           !- Schedule Name
,
OUTPUT:VARIABLE,
    *,                          !- Key Value
    Zone Operative Temperature,    !- Variable Name
```

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```
    Hourly,                   !- Reporting Frequency
    ;                         !- Schedule Name
,
OUTPUT:VARIABLE,
    *,                        !- Key Value
    Adaptive Cooling Setpoint Temperature_No Tolerance,    !- Variable Name
    Runperiod,                !- Reporting Frequency
    ;                         !- Schedule Name
,
OUTPUT:VARIABLE,
    *,                        !- Key Value
    Adaptive Heating Setpoint Temperature_No Tolerance,    !- Variable Name
    Runperiod,                !- Reporting Frequency
    ;                         !- Schedule Name
,
OUTPUT:VARIABLE,
    *,                        !- Key Value
    Zone Operative Temperature,    !- Variable Name
    Runperiod,                !- Reporting Frequency
    ;                         !- Schedule Name
]
```

We can see in this case 6 Output:Variable objects, which are the ones we previously requested: - Zone Operative Temperature - Adaptive Cooling Setpoint Temperature_No Tolerance - Adaptive Heating Setpoint Temperature_No Tolerance

in both Hourly and Runperiod Reporting Frequencies.

As usual, let's remove all the output idfs, so that we can re-run the notebook.

[38]:
```
for i in os.listdir():
    if i.endswith('.idf') and input_idf[0] not in i:
        os.remove(i)
```

CHAPTER

NINE

FULL EXAMPLE OF ADAPTIVE SETPOINT TEMPERATURE SIMULATION

In this section, we're going to run a simulation with adaptive setpoint temperatures. Say we want to run some simulations using a **Japanese local comfort model** developed by Hom Bahadur Rijal in some **locations in Japan**, and also we want to **analyse and visualize the data**. First of all, given EnergyPlus (any version between 9.1 and 23.1 included) is installed, and accim has been installed by entering 'pip install accim' in the CMD terminal, let's prepare the files we need: the IDF(s) and the EPW(s). Let's see what file we have in the folder and then we'll continue with the IDF(s).

[1]:
```
from os import listdir
input_files = [i for i in listdir()]
print(*input_files, sep='\n')
```

```
.ipynb_checkpoints
backup
Current_Naha_JA-hour.epw
Current_Sapporo_JA-hour.epw
full_example.ipynb
rcp85_2100_Naha_JA-hour.epw
rcp85_2100_Sapporo_JA-hour.epw
TestModel.idf
__init__.py
```

9.1 1. IDF (using `addAccis()`)

Say we have one or multiple IDF files, with an existing HVAC system (in this case, the use of mixed-mode ScriptType 'ex_mm' is not recommended; only full air-conditioning) or with no HVAC system at all (in this case, any of the 'vrf_ac' or 'vrf_mm' ScriptTypes are recommended). In this example, we are going to use an IDF without HVAC system, and we are going to use 'vrf_mm' so that accim adds a generic VRF system.

Let's see what IDFs we do have in our folder:

[2]:
```
input_idfs = [i for i in listdir() if i.endswith('.idf')]
print(input_idfs)
```

```
['TestModel.idf']
```

So now, we're going to generate building energy models with setpoint temperatures based on the Japanese comfort model (i.e. ComfStand takes the value 3) and ASHRAE 55 (i.e. ComfStand takes the value 2). We're going to select the 80% acceptability levels for both (i.e. CAT takes the value 80), and we're going to select the setpoint behaviour to horizontally extend the setpoint temperatures (or comfort limits) when applicability limits are exceeded (i.e. ComfMod

takes the value 3). There are 2 methods to apply adaptive setpoint temperatures: - Short method, which is running the following to lines of code:

```
from accim.sim import accis
accis.addAccis()
```

When we run the 2 lines of code above, accim is going to ask us to enter some information it needs to generate the output IDFs. The data we're going to input, in the same order, is: - Enter the ScriptType: **vrf_mm** - Enter the SupplyAirTempInputMethod: **temperature difference** - Do you want to keep the existing outputs (true or false)?: **false** - Enter the Output type (standard, simplified or detailed): **standard** - Enter the Output frequencies separated by space (timestep, hourly, daily, monthly, runperiod): **hourly monthly** - Enter the EnergyPlus version (9.1 to 23.1): **23.1** - Enter the Temperature Control method (temperature or pmv): **temperature**

After that, accim will let us know the information we have entered, and it will start the generic IDF generation process. Lots of actions are going to be performed, and all of them will be printed on screen. Once this process is done, accim will let us know if any of the IDFs is not going to work for any reason, and then it will start the output IDF files generation process. Then, accim will ask us again to enter some information, this time to generate the output IDF(s). The data we are going to enter now is:

- Enter the Comfort Standard numbers separated by space: **2 3**
- Enter the Category numbers separated by space: **80**
- Enter the Comfort Mode numbers separated by space: **0 3** (where 0 and 3 are respectively static and adaptive setpoints)
- Enter the HVAC Mode numbers separated by space: **1 2** (in this case we have also selected 1 for naturally ventilated, to see the difference with mixed-mode)
- Enter the Ventilation Control numbers separated by space: **0**

For all the remaining arguments, we're going to hit enter to omit it and take the default value. Finally, accim will let us know the list of output IDFs and will ask for confirmation to proceed:

- Do you still want to run ACCIS? [y/n]: **y**

Alternatively, we could specify all the arguments when calling the function, as shown in the cell below:

[3]:
```
from accim.sim import accis
accis.addAccis(
    ScriptType='vrf_mm',
    SupplyAirTempInputMethod='temperature difference',
    Output_keep_existing=False,
    Output_type='standard',
    Output_freqs=['hourly', 'monthly'],
    EnergyPlus_version='23.1',
    TempCtrl='temperature',
    ComfStand=[2, 3],
    CAT=[80],
    ComfMod=[0, 3],
    HVACmode=[1, 2],
    VentCtrl=[0],
    VSToffset=[0],
    MinOToffset=[50],
    MaxWindSpeed=[50],
    ASTtol_steps=0.1,
    ASTtol_start=0.1,
    ASTtol_end_input=0.1,
```

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```
    confirmGen=True
)
```

```
-----------------------------------------------------------
Adaptive-Comfort-Control-Implemented Model (ACCIM) v0.7.0
-----------------------------------------------------------

This tool allows to apply adaptive setpoint temperatures.
For further information, please read the documentation:
https://accim.readthedocs.io/en/master/
For a visual understanding of the tool, please visit the following jupyter notebooks:
-    Using addAccis() to apply adaptive setpoint temperatures
https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_
↪notebooks/addAccis/using_addAccis.ipynb
-    Using rename_epw_files() to rename the EPWs for proper data analysis after␣
↪simulation
https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_
↪notebooks/rename_epw_files/using_rename_epw_files.ipynb
-    Using runEp() to directly run simulations with EnergyPlus
https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_
↪notebooks/runEp/using_runEp.ipynb
-    Using the class Table() for data analysis
https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_
↪notebooks/Table/using_Table.ipynb
-    Full example
https://github.com/dsanchez-garcia/accim/blob/master/accim/sample_files/jupyter_
↪notebooks/Table/using_Table.ipynb

Starting with the process.
Basic input data:
ScriptType is: vrf_mm
Supply Air Temperature Input Method is: temperature difference
Output type is: standard
Output frequencies are:
['hourly', 'monthly']
EnergyPlus version is: 23.1
Temperature Control method is: temperature

=======================START OF GENERIC IDF FILE GENERATION␣
↪PROCESS=======================

Starting with file:
TestModel
IDD location is: C:\EnergyPlusV23-1-0\Energy+.idd
The occupied zones in the model TestModel are:
BLOCK1:ZONE2
BLOCK1:ZONE1
The windows and doors in the model TestModel are:
Block1_Zone2_Wall_3_0_0_0_0_0_Win
Block1_Zone2_Wall_4_0_0_0_0_0_Win
Block1_Zone2_Wall_5_0_0_0_0_0_Win
```

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```
Block1_Zone1_Wall_2_0_0_0_0_0_Win
Block1_Zone1_Wall_3_0_0_0_0_0_Win
Block1_Zone1_Wall_5_0_0_0_0_0_Win
The zones in the model TestModel are:
BLOCK1_ZONE2
BLOCK1_ZONE1
The people objects in the model have been amended.
BLOCK1:ZONE2 Thermostat has been added
BLOCK1:ZONE1 Thermostat has been added
On Schedule already was in the model
TypOperativeTempControlSch Schedule already was in the model
All ZoneHVAC:IdealLoadsAirSystem Heating and Cooling availability schedules has been set␣
↪to on
On 24/7 Schedule already was in the model
Control type schedule: Always 4 Schedule has been added
Relative humidity setpoint schedule: Always 50.00 Schedule has been added
Heating Fanger comfort setpoint: Always -0.5 Schedule has been added
Cooling Fanger comfort setpoint: Always  0.1 Schedule has been added
Zone CO2 setpoint: Always 900ppm Schedule has been added
Min CO2 concentration: Always 600ppm Schedule has been added
Generic contaminant setpoint: Always 0.5ppm Schedule has been added
Air distribution effectiveness (always 1) Schedule has been added
VRF Heating Cooling (Northern Hemisphere) Schedule has been added
DefaultFanEffRatioCurve Curve:Cubic Object has been added
VRFTUCoolCapFT Curve:Cubic Object has been added
VRFTUHeatCapFT Curve:Cubic Object has been added
VRFCoolCapFTBoundary Curve:Cubic Object has been added
VRFCoolEIRFTBoundary Curve:Cubic Object has been added
CoolingEIRLowPLR Curve:Cubic Object has been added
VRFHeatCapFTBoundary Curve:Cubic Object has been added
VRFHeatEIRFTBoundary Curve:Cubic Object has been added
HeatingEIRLowPLR Curve:Cubic Object has been added
DefaultFanPowerRatioCurve Curve:Exponent Object has been added
DXHtgCoilDefrostEIRFT Curve:Biquadratic Object has been added
VRFCoolCapFT Curve:Biquadratic Object has been added
VRFCoolCapFTHi Curve:Biquadratic Object has been added
VRFCoolEIRFT Curve:Biquadratic Object has been added
VRFCoolEIRFTHi Curve:Biquadratic Object has been added
VRFHeatCapFT Curve:Biquadratic Object has been added
VRFHeatCapFTHi Curve:Biquadratic Object has been added
VRFHeatEIRFT Curve:Biquadratic Object has been added
VRFHeatEIRFTHi Curve:Biquadratic Object has been added
CoolingLengthCorrectionFactor Curve:Biquadratic Object has been added
VRF Piping Correction Factor for Length in Heating Mode Curve:Biquadratic Object has␣
↪been added
VRF Heat Recovery Cooling Capacity Modifier Curve:Biquadratic Object has been added
VRF Heat Recovery Cooling Energy Modifier Curve:Biquadratic Object has been added
VRF Heat Recovery Heating Capacity Modifier Curve:Biquadratic Object has been added
VRF Heat Recovery Heating Energy Modifier Curve:Biquadratic Object has been added
VRFACCoolCapFFF Curve:Quadratic Object has been added
CoolingEIRHiPLR Curve:Quadratic Object has been added
VRFCPLFFPLR Curve:Quadratic Object has been added
```

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```
HeatingEIRHiPLR Curve:Quadratic Object has been added
CoolingCombRatio Curve:Linear Object has been added
HeatingCombRatio Curve:Linear Object has been added
VRF Outdoor Unit_BLOCK1:ZONE2 AirConditioner:VariableRefrigerantFlow Object has been␣
↪added
VRF Outdoor Unit_BLOCK1:ZONE1 AirConditioner:VariableRefrigerantFlow Object has been␣
↪added
VRF Outdoor Unit_BLOCK1:ZONE2 Outdoor Air Node Object has been added
VRF Outdoor Unit_BLOCK1:ZONE2 Zone List Object has been added
VRF Outdoor Unit_BLOCK1:ZONE1 Outdoor Air Node Object has been added
VRF Outdoor Unit_BLOCK1:ZONE1 Zone List Object has been added
BLOCK1:ZONE2 Sizing:Zone Object has been added
BLOCK1:ZONE1 Sizing:Zone Object has been added
BLOCK1:ZONE2 Design Specification Outdoor Air Object has been added
BLOCK1:ZONE1 Design Specification Outdoor Air Object has been added
BLOCK1:ZONE2 Design Specification Zone Air Distribution Object has been added
BLOCK1:ZONE1 Design Specification Zone Air Distribution Object has been added
BLOCK1:ZONE2 Nodelist Objects has been added
BLOCK1:ZONE1 Nodelist Objects has been added
BLOCK1:ZONE2 ZoneHVAC:EquipmentConnections Objects has been added
BLOCK1:ZONE1 ZoneHVAC:EquipmentConnections Objects has been added
BLOCK1:ZONE2 ZoneHVAC:EquipmentList Objects has been added
BLOCK1:ZONE1 ZoneHVAC:EquipmentList Objects has been added
BLOCK1:ZONE2 ZoneHVAC:TerminalUnit:VariableRefrigerantFlow Object has been added
BLOCK1:ZONE1 ZoneHVAC:TerminalUnit:VariableRefrigerantFlow Object has been added
BLOCK1:ZONE2 Coil:Cooling:DX:VariableRefrigerantFlow Object has been added
BLOCK1:ZONE1 Coil:Cooling:DX:VariableRefrigerantFlow Object has been added
BLOCK1:ZONE2 Coil:Heating:DX:VariableRefrigerantFlow Object has been added
BLOCK1:ZONE1 Coil:Heating:DX:VariableRefrigerantFlow Object has been added
BLOCK1:ZONE2 Fan:ConstantVolume Object has been added
BLOCK1:ZONE1 Fan:ConstantVolume Object has been added
Vent_SP_temp Schedule has been added
AHST_Sch_BLOCK1_ZONE2 Schedule has been added
ACST_Sch_BLOCK1_ZONE2 Schedule has been added
AHST_Sch_BLOCK1_ZONE1 Schedule has been added
ACST_Sch_BLOCK1_ZONE1 Schedule has been added
Added - SetComfTemp Program
Added - CountHours_BLOCK1_ZONE2 Program
Added - CountHours_BLOCK1_ZONE1 Program
Added - SetAppLimits Program
Added - ApplyCAT Program
Added - SetAST Program
Added - SetASTnoTol Program
Added - CountHoursNoApp_BLOCK1_ZONE2 Program
Added - SetGeoVarBLOCK1_ZONE2 Program
Added - CountHoursNoApp_BLOCK1_ZONE1 Program
Added - SetGeoVarBLOCK1_ZONE1 Program
Added - SetInputData Program
Added - SetVOFinputData Program
Added - SetVST Program
Added - ApplyAST_BLOCK1_ZONE2 Program
Added - ApplyAST_BLOCK1_ZONE1 Program
```

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```
Added - SetMyVOF_Block1_Zone2_Wall_3_0_0_0_0_0_Win Program
Added - SetWindowOperation_Block1_Zone2_Wall_3_0_0_0_0_0_Win Program
Added - SetMyVOF_Block1_Zone2_Wall_4_0_0_0_0_0_Win Program
Added - SetWindowOperation_Block1_Zone2_Wall_4_0_0_0_0_0_Win Program
Added - SetMyVOF_Block1_Zone2_Wall_5_0_0_0_0_0_Win Program
Added - SetWindowOperation_Block1_Zone2_Wall_5_0_0_0_0_0_Win Program
Added - SetMyVOF_Block1_Zone1_Wall_2_0_0_0_0_0_Win Program
Added - SetWindowOperation_Block1_Zone1_Wall_2_0_0_0_0_0_Win Program
Added - SetMyVOF_Block1_Zone1_Wall_3_0_0_0_0_0_Win Program
Added - SetWindowOperation_Block1_Zone1_Wall_3_0_0_0_0_0_Win Program
Added - SetMyVOF_Block1_Zone1_Wall_5_0_0_0_0_0_Win Program
Added - SetWindowOperation_Block1_Zone1_Wall_5_0_0_0_0_0_Win Program
Added - Comfort Temperature Output Variable
Added - Adaptive Cooling Setpoint Temperature Output Variable
Added - Adaptive Heating Setpoint Temperature Output Variable
Added - Adaptive Cooling Setpoint Temperature_No Tolerance Output Variable
Added - Adaptive Heating Setpoint Temperature_No Tolerance Output Variable
Added - Ventilation Setpoint Temperature Output Variable
Added - Minimum Outdoor Temperature for ventilation Output Variable
Added - Minimum Outdoor Temperature Difference for ventilation Output Variable
Added - Maximum Outdoor Temperature Difference for ventilation Output Variable
Added - Multiplier for Ventilation Opening Factor Output Variable
Added - Comfortable Hours_No Applicability_BLOCK1_ZONE2 Output Variable
Added - Comfortable Hours_No Applicability_BLOCK1_ZONE1 Output Variable
Added - Comfortable Hours_Applicability_BLOCK1_ZONE2 Output Variable
Added - Comfortable Hours_Applicability_BLOCK1_ZONE1 Output Variable
Added - Discomfortable Applicable Hot Hours_BLOCK1_ZONE2 Output Variable
Added - Discomfortable Applicable Hot Hours_BLOCK1_ZONE1 Output Variable
Added - Discomfortable Applicable Cold Hours_BLOCK1_ZONE2 Output Variable
Added - Discomfortable Applicable Cold Hours_BLOCK1_ZONE1 Output Variable
Added - Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE2 Output Variable
Added - Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE1 Output Variable
Added - Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE2 Output Variable
Added - Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE1 Output Variable
Added - Zone Floor Area_BLOCK1_ZONE2 Output Variable
Added - Zone Floor Area_BLOCK1_ZONE1 Output Variable
Added - Zone Air Volume_BLOCK1_ZONE2 Output Variable
Added - Zone Air Volume_BLOCK1_ZONE1 Output Variable
Added - Ventilation Hours_BLOCK1_ZONE2 Output Variable
Added - Ventilation Hours_BLOCK1_ZONE1 Output Variable
Global variables objects have been added
Internal variables objects have been added
Added - RMOT Sensor
Added - PMOT Sensor
Added - BLOCK1_ZONE2_OpT Sensor
Added - BLOCK1_ZONE2_WindSpeed Sensor
Added - BLOCK1_ZONE2_OutT Sensor
Added - BLOCK1_ZONE1_OpT Sensor
Added - BLOCK1_ZONE1_WindSpeed Sensor
Added - BLOCK1_ZONE1_OutT Sensor
Added - Block1_Zone2_Wall_3_0_0_0_0_0_Win_OpT Sensor
Added - Block1_Zone2_Wall_3_0_0_0_0_0_Win_WindSpeed Sensor
```

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```
Added - Block1_Zone2_Wall_3_0_0_0_0_0_Win_OutT Sensor
Added - Block1_Zone2_Wall_4_0_0_0_0_0_Win_OpT Sensor
Added - Block1_Zone2_Wall_4_0_0_0_0_0_Win_WindSpeed Sensor
Added - Block1_Zone2_Wall_4_0_0_0_0_0_Win_OutT Sensor
Added - Block1_Zone2_Wall_5_0_0_0_0_0_Win_OpT Sensor
Added - Block1_Zone2_Wall_5_0_0_0_0_0_Win_WindSpeed Sensor
Added - Block1_Zone2_Wall_5_0_0_0_0_0_Win_OutT Sensor
Added - Block1_Zone1_Wall_2_0_0_0_0_0_Win_OpT Sensor
Added - Block1_Zone1_Wall_2_0_0_0_0_0_Win_WindSpeed Sensor
Added - Block1_Zone1_Wall_2_0_0_0_0_0_Win_OutT Sensor
Added - Block1_Zone1_Wall_3_0_0_0_0_0_Win_OpT Sensor
Added - Block1_Zone1_Wall_3_0_0_0_0_0_Win_WindSpeed Sensor
Added - Block1_Zone1_Wall_3_0_0_0_0_0_Win_OutT Sensor
Added - Block1_Zone1_Wall_5_0_0_0_0_0_Win_OpT Sensor
Added - Block1_Zone1_Wall_5_0_0_0_0_0_Win_WindSpeed Sensor
Added - Block1_Zone1_Wall_5_0_0_0_0_0_Win_OutT Sensor
Added - OutT Sensor
Added - AHST_Act_BLOCK1_ZONE2 Actuator
Added - ACST_Act_BLOCK1_ZONE2 Actuator
Added - AHST_Act_BLOCK1_ZONE1 Actuator
Added - ACST_Act_BLOCK1_ZONE1 Actuator
Added - Block1_Zone2_Wall_3_0_0_0_0_0_Win_VentOpenFact Actuator
Added - Block1_Zone2_Wall_4_0_0_0_0_0_Win_VentOpenFact Actuator
Added - Block1_Zone2_Wall_5_0_0_0_0_0_Win_VentOpenFact Actuator
Added - Block1_Zone1_Wall_2_0_0_0_0_0_Win_VentOpenFact Actuator
Added - Block1_Zone1_Wall_3_0_0_0_0_0_Win_VentOpenFact Actuator
Added - Block1_Zone1_Wall_5_0_0_0_0_0_Win_VentOpenFact Actuator
Added - BLOCK1_ZONE2_CoolCoil Sensor
Added - BLOCK1_ZONE2_HeatCoil Sensor
Added - BLOCK1_ZONE1_CoolCoil Sensor
Added - BLOCK1_ZONE1_HeatCoil Sensor
Added - Block1_Zone2_Wall_3_0_0_0_0_0_Win_CoolCoil Sensor
Added - Block1_Zone2_Wall_3_0_0_0_0_0_Win_HeatCoil Sensor
Added - Block1_Zone2_Wall_4_0_0_0_0_0_Win_CoolCoil Sensor
Added - Block1_Zone2_Wall_4_0_0_0_0_0_Win_HeatCoil Sensor
Added - Block1_Zone2_Wall_5_0_0_0_0_0_Win_CoolCoil Sensor
Added - Block1_Zone2_Wall_5_0_0_0_0_0_Win_HeatCoil Sensor
Added - Block1_Zone1_Wall_2_0_0_0_0_0_Win_CoolCoil Sensor
Added - Block1_Zone1_Wall_2_0_0_0_0_0_Win_HeatCoil Sensor
Added - Block1_Zone1_Wall_3_0_0_0_0_0_Win_CoolCoil Sensor
Added - Block1_Zone1_Wall_3_0_0_0_0_0_Win_HeatCoil Sensor
Added - Block1_Zone1_Wall_5_0_0_0_0_0_Win_CoolCoil Sensor
Added - Block1_Zone1_Wall_5_0_0_0_0_0_Win_HeatCoil Sensor
Added - SetComfTemp Program Calling Manager
Added - CountHours_BLOCK1_ZONE2 Program Calling Manager
Added - CountHours_BLOCK1_ZONE1 Program Calling Manager
Added - SetAppLimits Program Calling Manager
Added - ApplyCAT Program Calling Manager
Added - SetAST Program Calling Manager
Added - SetASTnoTol Program Calling Manager
Added - CountHoursNoApp_BLOCK1_ZONE2 Program Calling Manager
Added - SetGeoVarBLOCK1_ZONE2 Program Calling Manager
```

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```
Added - CountHoursNoApp_BLOCK1_ZONE1 Program Calling Manager
Added - SetGeoVarBLOCK1_ZONE1 Program Calling Manager
Added - SetInputData Program Calling Manager
Added - SetVOFinputData Program Calling Manager
Added - SetVST Program Calling Manager
Added - ApplyAST_BLOCK1_ZONE2 Program Calling Manager
Added - ApplyAST_BLOCK1_ZONE1 Program Calling Manager
Added - SetMyVOF_Block1_Zone2_Wall_3_0_0_0_0_0_Win Program Calling Manager
Added - SetWindowOperation_Block1_Zone2_Wall_3_0_0_0_0_0_Win Program Calling Manager
Added - SetMyVOF_Block1_Zone2_Wall_4_0_0_0_0_0_Win Program Calling Manager
Added - SetWindowOperation_Block1_Zone2_Wall_4_0_0_0_0_0_Win Program Calling Manager
Added - SetMyVOF_Block1_Zone2_Wall_5_0_0_0_0_0_Win Program Calling Manager
Added - SetWindowOperation_Block1_Zone2_Wall_5_0_0_0_0_0_Win Program Calling Manager
Added - SetMyVOF_Block1_Zone1_Wall_2_0_0_0_0_0_Win Program Calling Manager
Added - SetWindowOperation_Block1_Zone1_Wall_2_0_0_0_0_0_Win Program Calling Manager
Added - SetMyVOF_Block1_Zone1_Wall_3_0_0_0_0_0_Win Program Calling Manager
Added - SetWindowOperation_Block1_Zone1_Wall_3_0_0_0_0_0_Win Program Calling Manager
Added - SetMyVOF_Block1_Zone1_Wall_5_0_0_0_0_0_Win Program Calling Manager
Added - SetWindowOperation_Block1_Zone1_Wall_5_0_0_0_0_0_Win Program Calling Manager
Added - Comfort Temperature Reporting FrequencyHourly Output:Variable data
Added - Adaptive Cooling Setpoint Temperature Reporting FrequencyHourly Output:Variable␣
↪data
Added - Adaptive Heating Setpoint Temperature Reporting FrequencyHourly Output:Variable␣
↪data
Added - Adaptive Cooling Setpoint Temperature_No Tolerance Reporting FrequencyHourly␣
↪Output:Variable data
Added - Adaptive Heating Setpoint Temperature_No Tolerance Reporting FrequencyHourly␣
↪Output:Variable data
Added - Ventilation Setpoint Temperature Reporting FrequencyHourly Output:Variable data
Added - Minimum Outdoor Temperature for ventilation Reporting FrequencyHourly Output:
↪Variable data
Added - Minimum Outdoor Temperature Difference for ventilation Reporting FrequencyHourly␣
↪Output:Variable data
Added - Maximum Outdoor Temperature Difference for ventilation Reporting FrequencyHourly␣
↪Output:Variable data
Added - Multiplier for Ventilation Opening Factor Reporting FrequencyHourly Output:
↪Variable data
Added - Comfortable Hours_No Applicability_BLOCK1_ZONE2 Reporting FrequencyHourly Output:
↪Variable data
Added - Comfortable Hours_No Applicability_BLOCK1_ZONE1 Reporting FrequencyHourly Output:
↪Variable data
Added - Comfortable Hours_Applicability_BLOCK1_ZONE2 Reporting FrequencyHourly Output:
↪Variable data
Added - Comfortable Hours_Applicability_BLOCK1_ZONE1 Reporting FrequencyHourly Output:
↪Variable data
Added - Discomfortable Applicable Hot Hours_BLOCK1_ZONE2 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Applicable Hot Hours_BLOCK1_ZONE1 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Applicable Cold Hours_BLOCK1_ZONE2 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Applicable Cold Hours_BLOCK1_ZONE1 Reporting FrequencyHourly␣
```

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```
↪Output:Variable data
Added - Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE2 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE1 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE2 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE1 Reporting FrequencyHourly␣
↪Output:Variable data
Added - Zone Floor Area_BLOCK1_ZONE2 Reporting FrequencyHourly Output:Variable data
Added - Zone Floor Area_BLOCK1_ZONE1 Reporting FrequencyHourly Output:Variable data
Added - Zone Air Volume_BLOCK1_ZONE2 Reporting FrequencyHourly Output:Variable data
Added - Zone Air Volume_BLOCK1_ZONE1 Reporting FrequencyHourly Output:Variable data
Added - Ventilation Hours_BLOCK1_ZONE2 Reporting FrequencyHourly Output:Variable data
Added - Ventilation Hours_BLOCK1_ZONE1 Reporting FrequencyHourly Output:Variable data
Added - Zone Operative Temperature Reporting FrequencyHourly Output:Variable data
Added - Zone Thermal Comfort CEN 15251 Adaptive Model Running Average Outdoor Air␣
↪Temperature Reporting FrequencyHourly Output:Variable data
Added - Zone Thermal Comfort ASHRAE 55 Adaptive Model Running Average Outdoor Air␣
↪Temperature Reporting FrequencyHourly Output:Variable data
Added - Cooling Coil Total Cooling Rate Reporting FrequencyHourly Output:Variable data
Added - Heating Coil Heating Rate Reporting FrequencyHourly Output:Variable data
Added - Facility Total HVAC Electric Demand Power Reporting FrequencyHourly Output:
↪Variable data
Added - Facility Total HVAC Electricity Demand Rate Reporting FrequencyHourly Output:
↪Variable data
Added - AFN Surface Venting Window or Door Opening Factor Reporting FrequencyHourly␣
↪Output:Variable data
Added - AFN Zone Infiltration Air Change Rate Reporting FrequencyHourly Output:Variable␣
↪data
Added - AFN Zone Infiltration Volume Reporting FrequencyHourly Output:Variable data
Added - AFN Zone Ventilation Air Change Rate Reporting FrequencyHourly Output:Variable␣
↪data
Added - AFN Zone Ventilation Volume Reporting FrequencyHourly Output:Variable data
Added - Site Outdoor Air Drybulb Temperature Reporting FrequencyHourly Output:Variable␣
↪data
Added - Site Wind Speed Reporting FrequencyHourly Output:Variable data
Added - Site Outdoor Air Relative Humidity Reporting FrequencyHourly Output:Variable data
Added - AHST_Sch_BLOCK1_ZONE2 Reporting FrequencyHourly Output:Variable data
Added - ACST_Sch_BLOCK1_ZONE2 Reporting FrequencyHourly Output:Variable data
Added - AHST_Sch_BLOCK1_ZONE1 Reporting FrequencyHourly Output:Variable data
Added - ACST_Sch_BLOCK1_ZONE1 Reporting FrequencyHourly Output:Variable data
Added - VRF Heat Pump Cooling Electricity Energy Reporting FrequencyHourly Output:
↪Variable data
Added - VRF Heat Pump Heating Electricity Energy Reporting FrequencyHourly Output:
↪Variable data
Added - BLOCK1_ZONE2 VRF Indoor Unit DX Cooling Coil Reporting FrequencyHourly Output:
↪Variable data
Added - BLOCK1_ZONE2 VRF Indoor Unit DX Heating Coil Reporting Frequency Hourly Output:
↪Variable data
Added - BLOCK1_ZONE1 VRF Indoor Unit DX Cooling Coil Reporting FrequencyHourly Output:
↪Variable data
```

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```
Added - BLOCK1_ZONE1 VRF Indoor Unit DX Heating Coil Reporting Frequency Hourly Output:
↪Variable data
Added - Comfort Temperature Reporting FrequencyMonthly Output:Variable data
Added - Adaptive Cooling Setpoint Temperature Reporting FrequencyMonthly Output:Variable␣
↪data
Added - Adaptive Heating Setpoint Temperature Reporting FrequencyMonthly Output:Variable␣
↪data
Added - Adaptive Cooling Setpoint Temperature_No Tolerance Reporting FrequencyMonthly␣
↪Output:Variable data
Added - Adaptive Heating Setpoint Temperature_No Tolerance Reporting FrequencyMonthly␣
↪Output:Variable data
Added - Ventilation Setpoint Temperature Reporting FrequencyMonthly Output:Variable data
Added - Minimum Outdoor Temperature for ventilation Reporting FrequencyMonthly Output:
↪Variable data
Added - Minimum Outdoor Temperature Difference for ventilation Reporting␣
↪FrequencyMonthly Output:Variable data
Added - Maximum Outdoor Temperature Difference for ventilation Reporting␣
↪FrequencyMonthly Output:Variable data
Added - Multiplier for Ventilation Opening Factor Reporting FrequencyMonthly Output:
↪Variable data
Added - Comfortable Hours_No Applicability_BLOCK1_ZONE2 Reporting FrequencyMonthly␣
↪Output:Variable data
Added - Comfortable Hours_No Applicability_BLOCK1_ZONE1 Reporting FrequencyMonthly␣
↪Output:Variable data
Added - Comfortable Hours_Applicability_BLOCK1_ZONE2 Reporting FrequencyMonthly Output:
↪Variable data
Added - Comfortable Hours_Applicability_BLOCK1_ZONE1 Reporting FrequencyMonthly Output:
↪Variable data
Added - Discomfortable Applicable Hot Hours_BLOCK1_ZONE2 Reporting FrequencyMonthly␣
↪Output:Variable data
Added - Discomfortable Applicable Hot Hours_BLOCK1_ZONE1 Reporting FrequencyMonthly␣
↪Output:Variable data
Added - Discomfortable Applicable Cold Hours_BLOCK1_ZONE2 Reporting FrequencyMonthly␣
↪Output:Variable data
Added - Discomfortable Applicable Cold Hours_BLOCK1_ZONE1 Reporting FrequencyMonthly␣
↪Output:Variable data
Added - Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE2 Reporting FrequencyMonthly␣
↪Output:Variable data
Added - Discomfortable Non Applicable Hot Hours_BLOCK1_ZONE1 Reporting FrequencyMonthly␣
↪Output:Variable data
Added - Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE2 Reporting FrequencyMonthly␣
↪Output:Variable data
Added - Discomfortable Non Applicable Cold Hours_BLOCK1_ZONE1 Reporting FrequencyMonthly␣
↪Output:Variable data
Added - Zone Floor Area_BLOCK1_ZONE2 Reporting FrequencyMonthly Output:Variable data
Added - Zone Floor Area_BLOCK1_ZONE1 Reporting FrequencyMonthly Output:Variable data
Added - Zone Air Volume_BLOCK1_ZONE2 Reporting FrequencyMonthly Output:Variable data
Added - Zone Air Volume_BLOCK1_ZONE1 Reporting FrequencyMonthly Output:Variable data
Added - Ventilation Hours_BLOCK1_ZONE2 Reporting FrequencyMonthly Output:Variable data
Added - Ventilation Hours_BLOCK1_ZONE1 Reporting FrequencyMonthly Output:Variable data
Added - Zone Operative Temperature Reporting FrequencyMonthly Output:Variable data
Added - Zone Thermal Comfort CEN 15251 Adaptive Model Running Average Outdoor Air␣
```

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```
↪Temperature Reporting FrequencyMonthly Output:Variable data
Added - Zone Thermal Comfort ASHRAE 55 Adaptive Model Running Average Outdoor Air␣
↪Temperature Reporting FrequencyMonthly Output:Variable data
Added - Cooling Coil Total Cooling Rate Reporting FrequencyMonthly Output:Variable data
Added - Heating Coil Heating Rate Reporting FrequencyMonthly Output:Variable data
Added - Facility Total HVAC Electric Demand Power Reporting FrequencyMonthly Output:
↪Variable data
Added - Facility Total HVAC Electricity Demand Rate Reporting FrequencyMonthly Output:
↪Variable data
Added - AFN Surface Venting Window or Door Opening Factor Reporting FrequencyMonthly␣
↪Output:Variable data
Added - AFN Zone Infiltration Air Change Rate Reporting FrequencyMonthly Output:Variable␣
↪data
Added - AFN Zone Infiltration Volume Reporting FrequencyMonthly Output:Variable data
Added - AFN Zone Ventilation Air Change Rate Reporting FrequencyMonthly Output:Variable␣
↪data
Added - AFN Zone Ventilation Volume Reporting FrequencyMonthly Output:Variable data
Added - Site Outdoor Air Drybulb Temperature Reporting FrequencyMonthly Output:Variable␣
↪data
Added - Site Wind Speed Reporting FrequencyMonthly Output:Variable data
Added - Site Outdoor Air Relative Humidity Reporting FrequencyMonthly Output:Variable␣
↪data
Added - AHST_Sch_BLOCK1_ZONE2 Reporting FrequencyMonthly Output:Variable data
Added - ACST_Sch_BLOCK1_ZONE2 Reporting FrequencyMonthly Output:Variable data
Added - AHST_Sch_BLOCK1_ZONE1 Reporting FrequencyMonthly Output:Variable data
Added - ACST_Sch_BLOCK1_ZONE1 Reporting FrequencyMonthly Output:Variable data
Added - VRF Heat Pump Cooling Electricity Energy Reporting FrequencyMonthly Output:
↪Variable data
Added - VRF Heat Pump Heating Electricity Energy Reporting FrequencyMonthly Output:
↪Variable data
Added - BLOCK1_ZONE2 VRF Indoor Unit DX Cooling Coil Reporting FrequencyMonthly Output:
↪Variable data
Added - BLOCK1_ZONE2 VRF Indoor Unit DX Heating Coil Reporting Frequency Monthly Output:
↪Variable data
Added - BLOCK1_ZONE1 VRF Indoor Unit DX Cooling Coil Reporting FrequencyMonthly Output:
↪Variable data
Added - BLOCK1_ZONE1 VRF Indoor Unit DX Heating Coil Reporting Frequency Monthly Output:
↪Variable data
IDF has been saved
Ending with file:
TestModel

=======================END OF GENERIC IDF FILE GENERATION PROCESS=======================

The following IDFs will not work, and therefore these will be deleted:
None

=======================START OF OUTPUT IDF FILES GENERATION␣
↪PROCESS=======================

The list of output IDFs is going to be:
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_1[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
```

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```
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT ASHRAE55[CA_80[CM_3[HM_1[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT ASHRAE55[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_JPN Rijal[CA_80[CM_0[HM_1[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_JPN Rijal[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_1[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
And the total number of output IDFs is going to be 8
Generating the following output IDF files:
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_1[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT ASHRAE55[CA_80[CM_3[HM_1[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT ASHRAE55[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_JPN Rijal[CA_80[CM_0[HM_1[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_JPN Rijal[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_1[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf

=======================END OF OUTPUT IDF FILES GENERATION PROCESS=======================
```

[3]:
```
<accim.sim.accis.addAccis at 0x17dbe51f1c0>
```

So, now let's see the list of output IDFs we have generated

[4]:
```
output_idfs = [i for i in listdir() if i.endswith('.idf') and i not in input_idfs]
print(*output_idfs, sep='\n')
```

```
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_1[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT ASHRAE55[CA_80[CM_3[HM_1[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT ASHRAE55[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_JPN Rijal[CA_80[CM_0[HM_1[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_JPN Rijal[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_1[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
```

In this case, we have generated more IDFs than we need, so let's remove the others. We only want a single naturally ventilated IDF, to compare the indoor temperature with the mixed-mode IDF with adaptive setpoints. IDFs are NV when HVACmode takes the value 1.

[5]:
```
idfs_to_be_removed = [i for i in listdir() if i.endswith('.idf') and 'HM_1' in i and
↪'ASHRAE55[CA_80[CM_3[HM_1' not in i]
print(*idfs_to_be_removed, sep='\n')
```

```
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_1[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_JPN Rijal[CA_80[CM_0[HM_1[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_1[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
```

[6]:
```
from os import remove
for i in idfs_to_be_removed:
    remove(i)
```

Let's see what IDFs we do finally have:

[7]:
```
output_idfs = [i for i in listdir() if i.endswith('.idf') and i not in input_idfs]
print(*output_idfs, sep='\n')
```

```
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT ASHRAE55[CA_80[CM_3[HM_1[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT ASHRAE55[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_JPN Rijal[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
```

So, we're done with the IDFs. You can see these have been named based on the input data, separated by the character '['. Let's move to the EPWs.

9.2 2. EPW (using `rename_epw_files()`)

Let's see the EPWs we are going to use for the simulations:

[8]:
```
original_epws = [i for i in listdir() if i.endswith('.epw')]
print(*original_epws, sep='\n')
```

```
Current_Naha_JA-hour.epw
Current_Sapporo_JA-hour.epw
rcp85_2100_Naha_JA-hour.epw
rcp85_2100_Sapporo_JA-hour.epw
```

However, we don't want to run the simulations using that name. To ease the later data analysis, we are going to rename the EPW files following the pattern 'Country_City_RCPscenario-Year'. This way, data will be able to be grouped by country, city, RCP scenario and year. So let's rename them running the code in the cell below.

First, accim will try to rename them based on the original name and the geolocation. If no match between those is found, accim will assign the string 'UNKNOWN' to the city. Then, accim will ask you if you want to edit some of the new names. If so, you'll need to enter the IDs: - If any of the city or subcountry names needs some amendment (if you are not happy with any of the available options, you can exclude it from renaming at the next stage), please enter the EPW IDs separated by space:**(hit enter)**

Afterwards, you'll be asked to enter the new city name for each ID you previously entered (in this case, 0 1 2 3). So, - Regarding the file ID: 0 … Please enter the amended city or subcountry, which must be unique: **Naha** - Regarding the file ID: 1 … Please enter the amended city or subcountry, which must be unique: **Sapporo** - Regarding the file ID: 2 … Please enter the amended city or subcountry, which must be unique: **Naha** - Regarding the file ID: 3 … Please enter the amended city or subcountry, which must be unique: **Sapporo**

Then, accim will let you know the old names, and the new named after amendments. Next, accim will ask you if you want to exclude some EPW from renaming. In this case, we're just going to hit enter to continue because we don't want to exclude any: - If you want to exclude some EPWs from renaming, please enter the new names separated by space, otherwise, hit enter to continue:

Finally, accim will ask for confirmation to proceed with the renaming: Do you want to rename the file or files? [y/n]:**y**

At this point, accim will make a copy of the EPWs and rename them. Afterwards, we would be asked if we want to delete the older EPWs. In this case, we won't because the deletion has been already set to False in the arguments.

[9]:
```
from accim.data.data_preprocessing import rename_epw_files
rename_epw_files(
    rename_dict={
        'Naha': 'Naha',
        'Sapporo': 'Sapporo'
```

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```
    },
    confirm_deletion=False
)
```

```
C:\users\sanga\appdata\local\programs\python\python39\lib\site-packages\accim\data\data_
↪preprocessing.py:181: FutureWarning: The default value of regex will change from True␣
↪to False in a future version.
  epw_df['EPW_names'] = epw_df['EPW_file_names'].str.replace('.epw', '')
C:\users\sanga\appdata\local\programs\python\python39\lib\site-packages\accim\data\data_
↪preprocessing.py:183: FutureWarning: The default value of regex will change from True␣
↪to False in a future version. In addition, single character regular expressions␣
↪will*not* be treated as literal strings when regex=True.
  epw_df['EPW_mod'] = epw_df['EPW_names'].str.replace('-', '_').str.replace('.', '_').
↪str.split('_')
C:\users\sanga\appdata\local\programs\python\python39\lib\site-packages\accim\data\data_
↪preprocessing.py:185: FutureWarning: The default value of regex will change from True␣
↪to False in a future version. In addition, single character regular expressions␣
↪will*not* be treated as literal strings when regex=True.
  epw_df['EPW_mod_filtered'] = epw_df['EPW_names'].str.replace('-', '_').str.replace('.',
↪ '_').str.split('_')
```

```
Since no match has been found between RCP scenario Year and EPW file name, Present year␣
↪has been assigned to the following EPW files:
Current_Naha_JA-hour.epw
Current_Sapporo_JA-hour.epw
The geolocation process has taken: 2.05 seconds (0.51 s/EPW)

The previous and new names of the EPW files and their unique IDs are:
ID: 0 / Current_Naha_JA-hour / Japan_Naha_Present
ID: 1 / Current_Sapporo_JA-hour / Japan_Sapporo_Present
ID: 2 / rcp85_2100_Naha_JA-hour / Japan_Naha_RCP85-2100
ID: 3 / rcp85_2100_Sapporo_JA-hour / Japan_Sapporo_RCP85-2100

If any of the city or subcountry names needs some amendment (if you are not happy with␣
↪any of the available options, you can exclude it from renaming at the next stage),␣
↪please enter the EPW IDs separated by space; otherwise, hit enter to omit:

The final list of previous and new names of the EPW files and their unique IDs is:
ID: 0 / Current_Naha_JA-hour / Japan_Naha_Present
ID: 1 / Current_Sapporo_JA-hour / Japan_Sapporo_Present
ID: 2 / rcp85_2100_Naha_JA-hour / Japan_Naha_RCP85-2100
ID: 3 / rcp85_2100_Sapporo_JA-hour / Japan_Sapporo_RCP85-2100

If you want to exclude some EPWs from renaming, please enter the IDs separated by space,␣
↪otherwise, hit enter to continue:

Do you want to copy and rename the file or files? [y/n]:y
The file Current_Naha_JA-hour has been renamed to Japan_Naha_Present
The file Current_Sapporo_JA-hour has been renamed to Japan_Sapporo_Present
The file rcp85_2100_Naha_JA-hour has been renamed to Japan_Naha_RCP85-2100
The file rcp85_2100_Sapporo_JA-hour has been renamed to Japan_Sapporo_RCP85-2100
```

[9]:
```
<accim.data.data_preprocessing.rename_epw_files at 0x17dbe51fc40>
```

Now, let's see what EPWs we do have:

[10]:
```
all_epws = [i for i in listdir() if i.endswith('.epw')]
print(*all_epws, sep='\n')
```

```
Current_Naha_JA-hour.epw
Current_Sapporo_JA-hour.epw
Japan_Naha_Present.epw
Japan_Naha_RCP85-2100.epw
Japan_Sapporo_Present.epw
Japan_Sapporo_RCP85-2100.epw
rcp85_2100_Naha_JA-hour.epw
rcp85_2100_Sapporo_JA-hour.epw
```

We can see the new EPWs are:

[11]:
```
new_epws = [i for i in listdir() if i.endswith('.epw') if i not in original_epws]
print(*new_epws, sep='\n')
```

```
Japan_Naha_Present.epw
Japan_Naha_RCP85-2100.epw
Japan_Sapporo_Present.epw
Japan_Sapporo_RCP85-2100.epw
```

EPWs are correctly renamed, so now let's move the old EPWs to a different folder to save them as a backup.

[12]:
```
import shutil
for i in original_epws:
    shutil.move(i, f'backup/{i}')
```

Now, we can move to the next stage.

9.3 3. Running the simulation (using `runEp()`)

At this point, we have prepared the IDF(s) we are going to simulate, which are

[13]:
```
print(*output_idfs, sep='\n')
```

```
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT ASHRAE55[CA_80[CM_3[HM_1[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT ASHRAE55[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_JPN Rijal[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
```

as well as the locations where we are going to run those simulations, whose EPWs are:

[14]:
```
print(*new_epws, sep='\n')
```

```
Japan_Naha_Present.epw
Japan_Naha_RCP85-2100.epw
Japan_Sapporo_Present.epw
Japan_Sapporo_RCP85-2100.epw
```

So, we are going to simulate all IDF(s) with all EPW(s). When we run later the simulations using accim, the output files (i.e. the CSVs) will be named following the pattern **'idf[epw'**, where the character '[' is used as a separator for

later data analysis, so that CSV rows can be grouped by EPW location. You may have noticed the same character is used as a separator in the IDF name, in order to group the CSV rows depending on the input data.

To run the simulations, 2 methods can be used: - the shorter, in which the following 2 lines of code needs to be run: `from accim.run import run run.runEp()` After this, you'll be asked to enter the EnergyPlus version (which should coincide with the IDF EnergyPlus version): - Please enter the desired EnergyPlus version: **23.1**

Then, you will need to say if you want to run only output IDFs of accim, or otherwise all existing IDFs in the folder: - Do you want to run only ACCIM output IDFs? [y or n]: **y**

Next, accim will tell you the IDF(s) and EPW(s) it's going to use for the simulations, and finally all the simulations it's going to run based on the name pattern 'idf[epw'. Finally, it will ask for confirmation to proceed with the simulation: - Do you still want to proceed? [y or n]:**y** - the longer method, in which the parameters are specified when calling the function. We'll use the longer method, so let's run the cell below. Since there are a few simulations, it might take a few minutes.

[15]:
```
from accim.run import run
run.runEp(
    runOnlyAccim=True, #only runs output IDFs, that is, IDFs with "[" in its name
    confirmRun=True, #to skip confirmation
    num_CPUs=4, #to specify the number of CPUs to be used
    EnergyPlus_version='23.1', #to specify the EnergyPlus version of the IDF, and the␣
↪version of EnergyPlus you are going to run
)
```

```
The IDFs we are going to run are:
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT ASHRAE55[CA_80[CM_3[HM_1[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT ASHRAE55[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_JPN Rijal[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
 and the No. of IDFs is going to be 5
The sample_EPWs we are going to run are:
Japan_Naha_Present.epw
Japan_Naha_RCP85-2100.epw
Japan_Sapporo_Present.epw
Japan_Sapporo_RCP85-2100.epw
 and the No. of sample_EPWs is going to be 4
Therefore, the simulations are going to be:
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_Present
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_RCP85-2100
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_Present
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_RCP85-2100
TestModel[CS_INT ASHRAE55[CA_80[CM_3[HM_1[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_Present
TestModel[CS_INT ASHRAE55[CA_80[CM_3[HM_1[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_RCP85-2100
TestModel[CS_INT ASHRAE55[CA_80[CM_3[HM_1[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_Present
TestModel[CS_INT ASHRAE55[CA_80[CM_3[HM_1[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_RCP85-2100
```

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```
TestModel[CS_INT ASHRAE55[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_Present
TestModel[CS_INT ASHRAE55[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_RCP85-2100
TestModel[CS_INT ASHRAE55[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_Present
TestModel[CS_INT ASHRAE55[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_RCP85-2100
TestModel[CS_JPN Rijal[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_Present
TestModel[CS_JPN Rijal[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_RCP85-2100
TestModel[CS_JPN Rijal[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_Present
TestModel[CS_JPN Rijal[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_RCP85-2100
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_Present
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_RCP85-2100
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_Present
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_RCP85-2100
 and the No. of simulations is going to be 20
```

So simulations are done. Let's see the CSV data we have now:

[16]:
```
csvs = [i for i in listdir() if i.endswith('.csv') and 'Zsz.csv' not in i and 'Table.csv
↪' not in i]
print(*csvs, sep='\n')
```

```
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_Present.csv
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_RCP85-2100.csv
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_Present.csv
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_RCP85-2100.csv
TestModel[CS_INT ASHRAE55[CA_80[CM_3[HM_1[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_Present.csv
TestModel[CS_INT ASHRAE55[CA_80[CM_3[HM_1[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_RCP85-2100.csv
TestModel[CS_INT ASHRAE55[CA_80[CM_3[HM_1[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_Present.csv
TestModel[CS_INT ASHRAE55[CA_80[CM_3[HM_1[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_RCP85-2100.csv
TestModel[CS_INT ASHRAE55[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_Present.csv
TestModel[CS_INT ASHRAE55[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_RCP85-2100.csv
TestModel[CS_INT ASHRAE55[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
```

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```
↪Sapporo_Present.csv
TestModel[CS_INT ASHRAE55[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_RCP85-2100.csv
TestModel[CS_JPN Rijal[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_Present.csv
TestModel[CS_JPN Rijal[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_RCP85-2100.csv
TestModel[CS_JPN Rijal[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_Present.csv
TestModel[CS_JPN Rijal[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_RCP85-2100.csv
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_Present.csv
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_RCP85-2100.csv
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_Present.csv
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_RCP85-2100.csv
```

Now, we can move to the last stage, in which data will be analysed and visualized.

9.4 4. Analysing and visualising the data (using `Table()`)

In order to analyse and visualize the data, we need to make a pandas DataFrame out of the CSVs. We will do this by using the `Table()` method. To use this method, a minimum knowledge and experience with Python programming is needed, so if this is not your case, you may struggle to make it work.

Let's create an hourly dataframe, since firstly we are going to compare indoor temperature with and without adaptive setpoint temperatures.

[17]:
```
from accim.data.data_postprocessing import Table
dataset_hourly = Table(
    #datasets=list #Since we are not specifying any list, it will use all available CSVs␣
↪in the folder
    source_frequency='hourly', # This lets accim know which is the frequency of the␣
↪input CSVs. Input CSVs with multiple frequencies are also allowed. It can be 'hourly',
↪'daily', 'monthly' and 'runperiod'. It can also be 'timestep' but might generate␣
↪errors.
    frequency='hourly', # If 'daily', accim will aggregate the rows in days. It can be
↪'hourly', 'daily', 'monthly' and 'runperiod'. It can also be 'timestep' but might␣
↪generate errors.
    frequency_agg_func='sum', #this makes the sum or average when aggregating in days,␣
↪months or runperiod; since the original CSV frequency is in hour, it won't make any␣
↪aeffect
    standard_outputs=True,
    level=['building'], # A list containing the strings 'block' and/or 'building'. For␣
↪instance, if ['block', 'building'], accim will generate new columns to sum up or␣
↪average in blocks and building level.
    level_agg_func=['sum', 'mean'], # A list containing the strings 'sum' and/or 'mean'.␣
↪For instance, if ['sum', 'mean'], accim will generate the new columns explained in the␣
```

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```
↪level argument by summing and averaging.
    level_excluded_zones=[],
    split_epw_names=True, #to split EPW names based on the pattern Country_City_
↪RCPscenario-Year
)
```

```
Input data frequency in file TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.
↪0[MW_50.0[AT_0.1[NS_X[Japan_Naha_Present.csv is hourly, therefore no aggregation will␣
↪be performed.
Input data frequency in file TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.
↪0[MW_50.0[AT_0.1[NS_X[Japan_Naha_RCP85-2100.csv is hourly, therefore no aggregation␣
↪will be performed.
Input data frequency in file TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.
↪0[MW_50.0[AT_0.1[NS_X[Japan_Sapporo_Present.csv is hourly, therefore no aggregation␣
↪will be performed.
Input data frequency in file TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.
↪0[MW_50.0[AT_0.1[NS_X[Japan_Sapporo_RCP85-2100.csv is hourly, therefore no aggregation␣
↪will be performed.
Input data frequency in file TestModel[CS_INT ASHRAE55[CA_80[CM_3[HM_1[VC_0[VO_0.0[MT_50.
↪0[MW_50.0[AT_0.1[NS_X[Japan_Naha_Present.csv is hourly, therefore no aggregation will␣
↪be performed.
Input data frequency in file TestModel[CS_INT ASHRAE55[CA_80[CM_3[HM_1[VC_0[VO_0.0[MT_50.
↪0[MW_50.0[AT_0.1[NS_X[Japan_Naha_RCP85-2100.csv is hourly, therefore no aggregation␣
↪will be performed.
Input data frequency in file TestModel[CS_INT ASHRAE55[CA_80[CM_3[HM_1[VC_0[VO_0.0[MT_50.
↪0[MW_50.0[AT_0.1[NS_X[Japan_Sapporo_Present.csv is hourly, therefore no aggregation␣
↪will be performed.
Input data frequency in file TestModel[CS_INT ASHRAE55[CA_80[CM_3[HM_1[VC_0[VO_0.0[MT_50.
↪0[MW_50.0[AT_0.1[NS_X[Japan_Sapporo_RCP85-2100.csv is hourly, therefore no aggregation␣
↪will be performed.
Input data frequency in file TestModel[CS_INT ASHRAE55[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.
↪0[MW_50.0[AT_0.1[NS_X[Japan_Naha_Present.csv is hourly, therefore no aggregation will␣
↪be performed.
Input data frequency in file TestModel[CS_INT ASHRAE55[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.
↪0[MW_50.0[AT_0.1[NS_X[Japan_Naha_RCP85-2100.csv is hourly, therefore no aggregation␣
↪will be performed.
Input data frequency in file TestModel[CS_INT ASHRAE55[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.
↪0[MW_50.0[AT_0.1[NS_X[Japan_Sapporo_Present.csv is hourly, therefore no aggregation␣
↪will be performed.
Input data frequency in file TestModel[CS_INT ASHRAE55[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.
↪0[MW_50.0[AT_0.1[NS_X[Japan_Sapporo_RCP85-2100.csv is hourly, therefore no aggregation␣
↪will be performed.
Input data frequency in file TestModel[CS_JPN Rijal[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.
↪0[MW_50.0[AT_0.1[NS_X[Japan_Naha_Present.csv is hourly, therefore no aggregation will␣
↪be performed.
Input data frequency in file TestModel[CS_JPN Rijal[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.
↪0[MW_50.0[AT_0.1[NS_X[Japan_Naha_RCP85-2100.csv is hourly, therefore no aggregation␣
↪will be performed.
Input data frequency in file TestModel[CS_JPN Rijal[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.
↪0[MW_50.0[AT_0.1[NS_X[Japan_Sapporo_Present.csv is hourly, therefore no aggregation␣
↪will be performed.
Input data frequency in file TestModel[CS_JPN Rijal[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.
```

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```
↪0[MW_50.0[AT_0.1[NS_X[Japan_Sapporo_RCP85-2100.csv is hourly, therefore no aggregation␣
↪will be performed.
Input data frequency in file TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.
↪0[MW_50.0[AT_0.1[NS_X[Japan_Naha_Present.csv is hourly, therefore no aggregation will␣
↪be performed.
Input data frequency in file TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.
↪0[MW_50.0[AT_0.1[NS_X[Japan_Naha_RCP85-2100.csv is hourly, therefore no aggregation␣
↪will be performed.
Input data frequency in file TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.
↪0[MW_50.0[AT_0.1[NS_X[Japan_Sapporo_Present.csv is hourly, therefore no aggregation␣
↪will be performed.
Input data frequency in file TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.
↪0[MW_50.0[AT_0.1[NS_X[Japan_Sapporo_RCP85-2100.csv is hourly, therefore no aggregation␣
↪will be performed.
Please bear in mind if you are using CSVs with multiple frequencies, you will get NaNs.␣
↪The following rows have NaN values:
           Date/Time  \
5591  08/21  24:00:00

      Environment:Site Outdoor Air Drybulb Temperature [C](Hourly)  \
5591                                          32.008333

      Environment:Site Outdoor Air Relative Humidity [%](Hourly)  \
5591                                          70.583333

      Environment:Site Wind Speed [m/s](Hourly)  \
5591                                      3.275

      EMS:Comfort Temperature [C](Hourly)  \
5591                             27.926645

      EMS:Adaptive Cooling Setpoint Temperature [C](Hourly)  \
5591                                            31.3266

      EMS:Adaptive Heating Setpoint Temperature [C](Hourly)  \
5591                                            24.5267

      EMS:Adaptive Cooling Setpoint Temperature_No Tolerance [C](Hourly)  \
5591                                          31.426645

      EMS:Adaptive Heating Setpoint Temperature_No Tolerance [C](Hourly)  \
5591                                          24.426645

      EMS:Ventilation Setpoint Temperature [C](Hourly)  ...  \
5591                                      27.926645  ...

      VRF OUTDOOR UNIT_BLOCK1:ZONE1:VRF Heat Pump Cooling Electricity Energy [J](Hourly)␣
↪ \
5591                                               0.0

      VRF OUTDOOR UNIT_BLOCK1:ZONE1:VRF Heat Pump Heating Electricity Energy [J](Hourly)␣
↪ \
```

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```
5591                                                0.0

                                                 Source  Month/Day  Hour  \
5591  TestModel[CS_INT ASHRAE55[CA_80[CM_3[HM_1[VC_0...              None

      Month   Day  Minute  Second  count
5591         None    None    None      1

[1 rows x 60 columns]
No zones have been excluded from level computations.
```

Let's filter the columns we are going to use:

[18]:
```
dataset_hourly.format_table(
    type_of_table='custom', # Used to choose some predefined tables. It can be 'energy␣
↪demand', 'comfort hours', 'temperature', 'all' or 'custom'
    custom_cols=[ #if type_of_table is 'custom', custom_cols is used to filter the␣
↪desired columns to keep
        'Adaptive Cooling Setpoint Temperature_No Tolerance (°C)',
        'Adaptive Heating Setpoint Temperature_No Tolerance (°C)',
        'Building_Total_Zone Operative Temperature (°C) (mean)',
        'BLOCK1:ZONE2_ASHRAE 55 Running mean outdoor temperature (°C)',
        'Building_Total_Cooling Energy Demand (kWh/m2) (summed)',
        'Building_Total_Heating Energy Demand (kWh/m2) (summed)',
        'Building_Total_AFN Zone Infiltration Air Change Rate (ach) (summed)'
    ]
)
```

9.4.1 4.1 Visualizing the data

And now, let's generate the figure data (a list of lists and dictionaries with all information to be plotted) with `generate_fig_data()` and afterwards, let's plot the figure with `scatter_plot()`.

[19]:
```

dataset_hourly.scatter_plot(
    vars_to_gather_rows=['EPW'], # variables to gather in rows of subplots
    vars_to_gather_cols=['ComfStand', 'ComfMod', 'HVACmode'],# variables to gather in␣
↪columns of subplots; all categorical columns which have more than 1 different value␣
↪across the rows, must be specified in this argument, otherwise you'll get an error.
    detailed_cols=['CS_INT ASHRAE55[CM_3[HM_1', 'CS_INT ASHRAE55[CM_3[HM_2'], # a list␣
↪of the specific combinations of arguments to be plotted joined by [
    data_on_x_axis='BLOCK1:ZONE2_ASHRAE 55 Running mean outdoor temperature (°C)',
↪#column name (string) for the data on x axis
    data_on_y_main_axis=[ #list which includes the name of the axis on the first place,␣
↪and then in the second place, a list which includes the column names you want to plot
        [
            'Indoor Operative Temperature (°C)',
            [
                'Adaptive Cooling Setpoint Temperature_No Tolerance (°C)',
                'Adaptive Heating Setpoint Temperature_No Tolerance (°C)',
                'Building_Total_Zone Operative Temperature (°C) (mean)',
```

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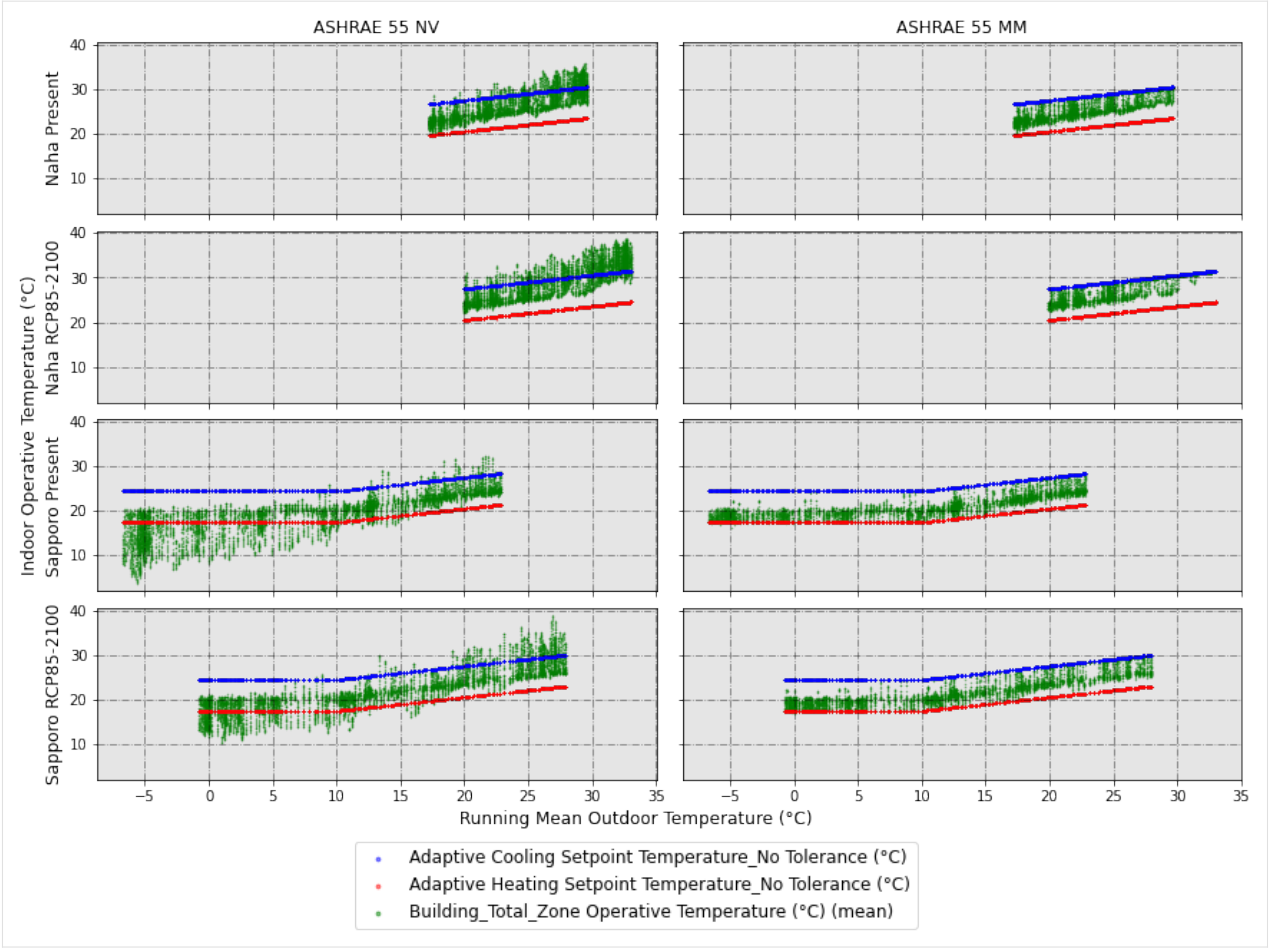
```
            ]
        ],
    ],
    colorlist_y_main_axis=[
        [
            'Indoor Operative Temperature (°C)',
            [
                'b',
                'r',
                'g',
            ]
        ],
    ],
    rows_renaming_dict={
        'Japan_Naha_Present': 'Naha Present',
        'Japan_Naha_RCP85-2100': 'Naha RCP85-2100',
        'Japan_Sapporo_Present': 'Sapporo Present',
        'Japan_Sapporo_RCP85-2100': 'Sapporo RCP85-2100',
    },
    cols_renaming_dict={
        'CS_INT ASHRAE55[CM_3[HM_1': 'ASHRAE 55 NV',
        'CS_INT ASHRAE55[CM_3[HM_2': 'ASHRAE 55 MM',
    },
    supxlabel='Running Mean Outdoor Temperature (°C)', # data label on x axis
    figname='Scatterplot_NV_vs_MM',
    figsize=6,
    ratio_height_to_width=0.33,
    confirm_graph=True
)
```

```
The number of rows and the list of these is going to be:
No. of rows = 4
List of rows:
Japan_Naha_Present
Japan_Naha_RCP85-2100
Japan_Sapporo_Present
Japan_Sapporo_RCP85-2100
The renamed rows are going to be:
Naha Present
Naha RCP85-2100
Sapporo Present
Sapporo RCP85-2100
The number of columns and the list of these is going to be:
No. of columns = 2
List of columns:
CS_INT ASHRAE55[CM_3[HM_1
CS_INT ASHRAE55[CM_3[HM_2
The renamed columns are going to be:
ASHRAE 55 NV
ASHRAE 55 MM
```



In this figure, you can see on the left column the simulations with free-running (or naturally ventilated) mode, while on the right, the same simulations using mixed-mode with adaptive setpoint temperatures, which introduce all hourly indoor temperatures within the adaptive thermal comfort limits.

Next, let's compare the indoor temperatures of ASHRAE 55, the local Japanese model and the static setpoints for Japan, and in this case, we're also going to plot the hourly energy demand on the secondary axis.

[20]:
```
dataset_hourly.scatter_plot(
    vars_to_gather_cols=['ComfStand', 'ComfMod', 'HVACmode'], # variables to gather in␣
↪rows of subplots
    vars_to_gather_rows=['EPW'],# variables to gather in columns of subplots
    detailed_cols=['CS_JPN Rijal[CM_0[HM_2', 'CS_INT ASHRAE55[CM_3[HM_2', 'CS_JPN␣
↪Rijal[CM_3[HM_2'], #we only want to see those combinations
    #custom_cols_order=['CS_JPN Rijal[CM_0[HM_2', 'CS_INT ASHRAE55[CM_3[HM_2', 'CS_JPN␣
↪Rijal[CM_3[HM_2'],
    data_on_x_axis='BLOCK1:ZONE2_ASHRAE 55 Running mean outdoor temperature (°C)',
↪#column name (string) for the data on x axis
    data_on_y_sec_axis=[ #list which includes the name of the axis on the first place,␣
↪and then in the second place, a list which includes the column names you want to plot
        [
            'Air renovation (ach)',
            [
                'Building_Total_AFN Zone Infiltration Air Change Rate (ach) (summed)'
```

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```
            ]
        ],
        [
            'Operative Temperature (°C)',
            [
                'Adaptive Cooling Setpoint Temperature_No Tolerance (°C)',
                'Adaptive Heating Setpoint Temperature_No Tolerance (°C)',
                'Building_Total_Zone Operative Temperature (°C) (mean)',
            ]
        ],
    ],
    data_on_y_main_axis=[ # similarly to above, a list including the name of the␣
↪secondary y-axis and the column names you want to plot in it
        [
            'Energy (kWh/m2)',
            [
                'Building_Total_Cooling Energy Demand (kWh/m2) (summed)',
                'Building_Total_Heating Energy Demand (kWh/m2) (summed)',
            ]
        ],

    ],
    colorlist_y_sec_axis=[
        [
            'Air renovation (ach)',
            [
                'yellow'
            ]
        ],
        [
            'Operative Temperature (°C)',
            [
                'b',
                'r',
                'g',
            ]
        ],
    ],
    colorlist_y_main_axis=[
        [
            'Energy (kWh/m2)',
            [
                'cyan',
                'orange',
            ]
        ],
    ],
    rows_renaming_dict={
        'Japan_Naha_Present': 'Naha Present',
        'Japan_Naha_RCP85-2100': 'Naha RCP85-2100',
        'Japan_Sapporo_Present': 'Sapporo Present',
        'Japan_Sapporo_RCP85-2100': 'Sapporo RCP85-2100',
```

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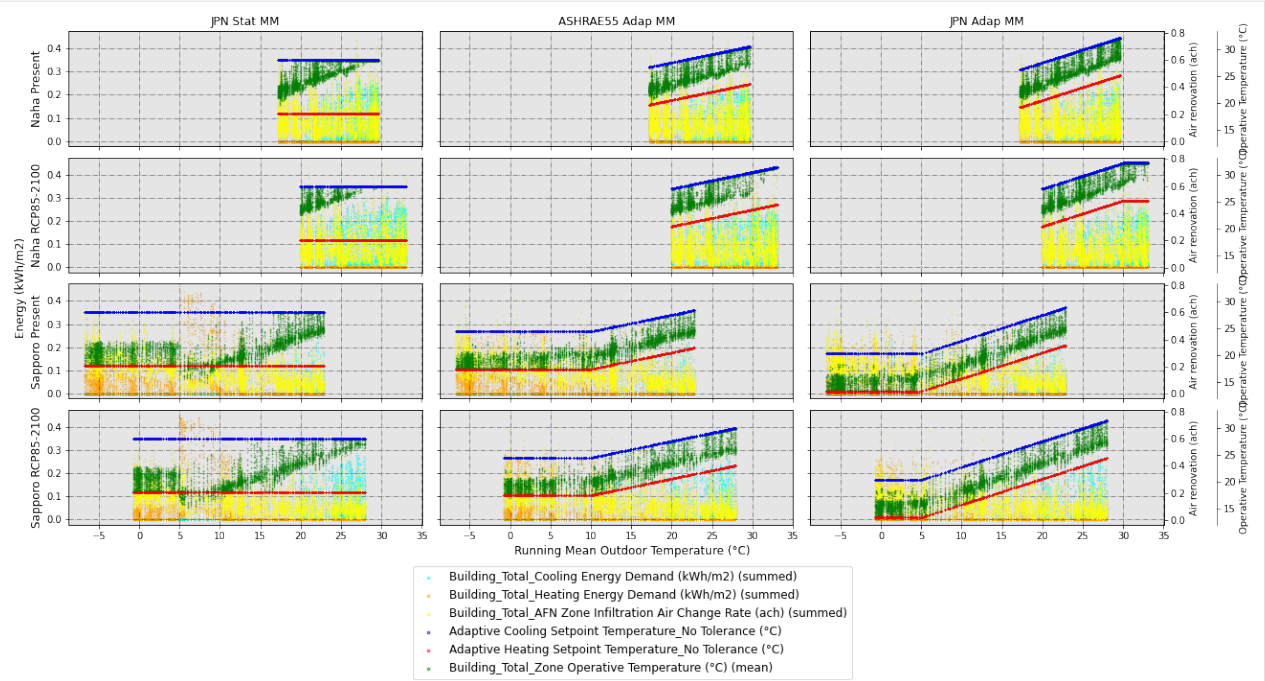
```
    },
    cols_renaming_dict={
        'CS_JPN Rijal[CM_0[HM_2': 'JPN Stat MM',
        'CS_INT ASHRAE55[CM_3[HM_2': 'ASHRAE55 Adap MM',
        'CS_JPN Rijal[CM_3[HM_2': 'JPN Adap MM'
    },
    supxlabel='Running Mean Outdoor Temperature (°C)', # data label on x axis
    figname=f'scatterplot_JPN_stat_ASH_adap_JPN_adap',
    figsize=6,
    ratio_height_to_width=0.33,
    confirm_graph=True
)
```

```
The number of rows and the list of these is going to be:
No. of rows = 4
List of rows:
Japan_Naha_Present
Japan_Naha_RCP85-2100
Japan_Sapporo_Present
Japan_Sapporo_RCP85-2100
The renamed rows are going to be:
Naha Present
Naha RCP85-2100
Sapporo Present
Sapporo RCP85-2100
The number of columns and the list of these is going to be:
No. of columns = 3
List of columns:
CS_JPN Rijal[CM_0[HM_2
CS_INT ASHRAE55[CM_3[HM_2
CS_JPN Rijal[CM_3[HM_2
The renamed columns are going to be:
JPN Stat MM
ASHRAE55 Adap MM
JPN Adap MM
```



9.4.2 4.2 Analysing the data

Now, let's see how many comfort hours were considering the NV mode, and afterwards the MM considering ASHRAE 55, as well as the impact on energy demand. Since we want to see the runperiod totals, we will need to make a new instance of Table(), asking for runperiod frequency this time.

[21]:
```
from accim.data.data_postprocessing import Table
dataset_runperiod = Table(
    #datasets=list #Since we are not specifying any list, it will use all available CSVs␣
↪in the folder
    source_frequency='hourly', # This lets accim know which is the frequency of the␣
↪input CSVs. Input CSVs with multiple frequencies are also allowed. It can be 'hourly',
↪'daily', 'monthly' and 'runperiod'. It can also be 'timestep' but might generate␣
↪errors.
    frequency='runperiod', # If 'daily', accim will aggregate the rows in days. It can␣
↪be 'hourly', 'daily', 'monthly' and 'runperiod'. It can also be 'timestep' but might␣
↪generate errors.
    frequency_agg_func='sum', #this makes the sum or average when aggregating in days,␣
↪months or runperiod; since the original CSV frequency is in hour, it won't make any␣
↪aeffect
    standard_outputs=True,
    level=['building'], # A list containing the strings 'block' and/or 'building'. For␣
↪instance, if ['block', 'building'], accim will generate new columns to sum up or␣
↪average in blocks and building level.
    level_agg_func=['sum', 'mean'], # A list containing the strings 'sum' and/or 'mean'.␣
↪For instance, if ['sum', 'mean'], accim will generate the new columns explained in the␣
↪level argument by summing and averaging.
    level_excluded_zones=[],
    #match_cities=bool #Only used when EPW file has NOT been previously renamed
```

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```
    #manage_epw_names=bool #Only used when EPW file has NOT been previously renamed
    split_epw_names=True, #to split EPW names based on the pattern Country_City_
↪RCPscenario-Year
)

dataset_runperiod.format_table(
    type_of_table='custom',
    custom_cols=[
        'Building_Total_Comfortable Hours_No Applicability (h) (mean)',
        'Building_Total_Total Energy Demand (kWh/m2) (summed)'
    ]
)

dataset_runperiod.wrangled_table(
    reshaping='unstack',
    vars_to_gather=['ComfStand', 'ComfMod', 'HVACmode'],
    baseline='CS_JPN Rijal[CM_3[HM_2',
    comparison_mode=['baseline compared to others'],
    comparison_cols=[],
    rename_dict={
        'CS_INT ASHRAE55[CM_0[HM_2': 'ASHRAE Stat MM',
        'CS_INT ASHRAE55[CM_3[HM_1': 'ASHRAE Adap NV',
        'CS_INT ASHRAE55[CM_3[HM_2': 'ASHRAE Adap MM',
        'CS_JPN Rijal[CM_0[HM_2': 'JPN Stat MM',
        'CS_JPN Rijal[CM_3[HM_2': 'JPN Adap MM',
    }
)

dataset_runperiod.wrangled_df_unstacked
```

```
No zones have been excluded from level computations.
```

[21]:

```
                                          Building_Total_Comfortable Hours_No␣
↪Applicability (h) (mean)  \
                                                                              ␣
↪  ASHRAE Stat MM
EPW_City_or_subcountry EPW_Scenario EPW_Year
Naha                   Present      Present                                   ␣
↪8707.42
                       RCP85        2100                                      ␣
↪8692.67
Sapporo                Present      Present                                   ␣
↪8218.67
                       RCP85        2100                                      ␣
↪8362.50

                                                                              \
                                          ASHRAE Adap NV ASHRAE Adap MM
EPW_City_or_subcountry EPW_Scenario EPW_Year
Naha                   Present      Present         6940.58        8733.42
                       RCP85        2100            5111.58        8714.08
Sapporo                Present      Present         5632.58        8533.33
                       RCP85        2100            6031.92        8563.58
```

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```
                                                                    \
                                                JPN Stat MM JPN Adap MM
EPW_City_or_subcountry EPW_Scenario EPW_Year
Naha                   Present      Present      8741.67     8744.50
                       RCP85        2100         8738.83     8704.67
Sapporo                Present      Present      8471.67     8559.58
                       RCP85        2100         8459.00     8613.75

                                                Building_Total_Total Energy Demand (kWh/m2)␣
↪(summed)  \                                                                                ␣
↪ASHRAE Stat MM
EPW_City_or_subcountry EPW_Scenario EPW_Year
Naha                   Present      Present                                                 ␣
↪552.12
                       RCP85        2100                                                    ␣
↪758.73
Sapporo                Present      Present                                                 ␣
↪594.15
                       RCP85        2100                                                    ␣
↪585.09

                                                                                  \
                                                ASHRAE Adap NV ASHRAE Adap MM
EPW_City_or_subcountry EPW_Scenario EPW_Year
Naha                   Present      Present              0.0          265.85
                       RCP85        2100                 0.0          419.02
Sapporo                Present      Present              0.0          292.39
                       RCP85        2100                 0.0          331.88


                                                JPN Stat MM JPN Adap MM
EPW_City_or_subcountry EPW_Scenario EPW_Year
Naha                   Present      Present        356.80       183.67
                       RCP85        2100           556.98       336.46
Sapporo                Present      Present        334.51       253.92
                       RCP85        2100           425.29       268.65
```

The table above shows us the comfort hours in NV (CS_INT ASHRAE55[CM_3[HM_1) mode ranges between 5115.25 and 6945.50 hours, while the same comfort model in mixed-mode with adaptive setpoints (CS_INT ASHRAE55[CM_3[HM_2) ranges between 8598.15 and 8758.85. Since there is no HVAC system in NV mode, the energy consumption is 0. With adaptive setpoints, the hvac energy consumption ranges between 262.08 and 414.84 (kWh/m2·year).

Now, we could finally export this table to Excel format for later style edition. Since the reshaping argument we used in the `wrangled_table()` method was 'unstack', the dataframe we are looking for to be exported is `dataset_runperiod.wrangled_df_unstacked`. If we used the 'pivot' argument, the dataframe would have been `dataset_runperiod.wrangled_df_pivoted`. So let's export it:

[22]:
```
dataset_runperiod.wrangled_df_unstacked.to_excel('df_unstacked.xlsx')
```

[23]:
```
import pandas as pd

df = pd.read_excel ('df_unstacked.xlsx')
print (df)
```

```
               Unnamed: 0    Unnamed: 1 Unnamed: 2  \
0                     NaN           NaN        NaN
1  EPW_City_or_subcountry  EPW_Scenario   EPW_Year
2                    Naha       Present    Present
3                     NaN         RCP85       2100
4                  Sapporo       Present    Present
5                     NaN         RCP85       2100

  Building_Total_Comfortable Hours_No Applicability (h) (mean)  \
0                                     ASHRAE Stat MM
1                                                NaN
2                                            8707.42
3                                            8692.67
4                                            8218.67
5                                             8362.5

       Unnamed: 4      Unnamed: 5   Unnamed: 6   Unnamed: 7  \
0  ASHRAE Adap NV  ASHRAE Adap MM  JPN Stat MM  JPN Adap MM
1             NaN             NaN          NaN          NaN
2         6940.58         8733.42      8741.67       8744.5
3         5111.58         8714.08      8738.83      8704.67
4         5632.58         8533.33      8471.67      8559.58
5         6031.92         8563.58         8459      8613.75

  Building_Total_Total Energy Demand (kWh/m2) (summed)      Unnamed: 9  \
0                                     ASHRAE Stat MM    ASHRAE Adap NV
1                                                NaN               NaN
2                                             552.12                 0
3                                             758.73                 0
4                                             594.15                 0
5                                             585.09                 0

      Unnamed: 10  Unnamed: 11  Unnamed: 12
0  ASHRAE Adap MM  JPN Stat MM  JPN Adap MM
1             NaN          NaN          NaN
2          265.85        356.8       183.67
3          419.02       556.98       336.46
4          292.39       334.51       253.92
5          331.88       425.29       268.65
```

Finally, so that we can run this jupyter notebook again, let's leave everything as it was at the beginning.

[24]:
```
for i in original_epws:
    shutil.move(f'backup/{i}', i)
```

[25]:
```
files_to_delete = [i for i in listdir() if i not in input_files]
print(*files_to_delete, sep='\n')
```

```
df_unstacked.xlsx
Japan_Naha_Present.epw
Japan_Naha_RCP85-2100.epw
Japan_Sapporo_Present.epw
Japan_Sapporo_RCP85-2100.epw
scatterplot_JPN_stat_ASH_adap_JPN_adap.png
Scatterplot_NV_vs_MM.png
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_Present.audit
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_Present.bnd
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_Present.csv
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_Present.dxf
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_Present.eio
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_Present.end
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_Present.err
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_Present.eso
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_Present.mdd
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_Present.mtd
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_Present.rdd
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_Present.rvaudit
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_Present.shd
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_PresentTable.csv
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_PresentTable.htm
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_PresentZsz.csv
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_RCP85-2100.audit
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_RCP85-2100.bnd
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_RCP85-2100.csv
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_RCP85-2100.dxf
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_RCP85-2100.eio
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_RCP85-2100.end
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
```

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```
↪Naha_RCP85-2100.err
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_RCP85-2100.eso
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_RCP85-2100.mdd
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_RCP85-2100.mtd
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_RCP85-2100.rdd
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_RCP85-2100.rvaudit
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_RCP85-2100.shd
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_RCP85-2100Table.csv
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_RCP85-2100Table.htm
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_RCP85-2100Zsz.csv
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_Present.audit
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_Present.bnd
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_Present.csv
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_Present.dxf
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_Present.eio
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_Present.end
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_Present.err
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_Present.eso
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_Present.mdd
TestModel[CS_INT ASHRAE55[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
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↪Sapporo_RCP85-2100.audit
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TestModel[CS_JPN Rijal[CA_80[CM_0[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
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TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.idf
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_Present.audit
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_Present.bnd
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_Present.csv
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_Present.dxf
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_Present.eio
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_Present.end
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_Present.err
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_Present.eso
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_Present.mdd
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_Present.mtd
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_Present.rdd
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_Present.rvaudit
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_Present.shd
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_PresentTable.csv
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_PresentTable.htm
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_PresentZsz.csv
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_RCP85-2100.audit
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_RCP85-2100.bnd
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_RCP85-2100.csv
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_RCP85-2100.dxf
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_RCP85-2100.eio
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_RCP85-2100.end
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_RCP85-2100.err
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_RCP85-2100.eso
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
```

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```
↪Naha_RCP85-2100.mdd
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_RCP85-2100.mtd
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_RCP85-2100.rdd
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_RCP85-2100.rvaudit
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_RCP85-2100.shd
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_RCP85-2100Table.csv
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_RCP85-2100Table.htm
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Naha_RCP85-2100Zsz.csv
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_Present.audit
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_Present.bnd
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_Present.csv
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_Present.dxf
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_Present.eio
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_Present.end
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_Present.err
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_Present.eso
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_Present.mdd
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_Present.mtd
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_Present.rdd
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_Present.rvaudit
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_Present.shd
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_PresentTable.csv
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_PresentTable.htm
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_PresentZsz.csv
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_RCP85-2100.audit
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_RCP85-2100.bnd
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
```

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```
↪Sapporo_RCP85-2100.csv
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_RCP85-2100.dxf
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_RCP85-2100.eio
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_RCP85-2100.end
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_RCP85-2100.err
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_RCP85-2100.eso
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_RCP85-2100.mdd
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_RCP85-2100.mtd
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_RCP85-2100.rdd
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_RCP85-2100.rvaudit
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_RCP85-2100.shd
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_RCP85-2100Table.csv
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_RCP85-2100Table.htm
TestModel[CS_JPN Rijal[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X[Japan_
↪Sapporo_RCP85-2100Zsz.csv
```

[26]:
```
for i in files_to_delete:
    remove(i)
```

CHAPTER

TEN

USING `RENAME_EPW_FILES()` TO RENAME THE EPWS FOR PROPER DATA ANALYSIS AFTER SIMULATION

`rename_epw_files` function will rename your EPW files following the naming convention "Country_City_RCPscenario-Year". It will get the Country and City fields from EPW coordinates, and the RCPscenario and Year fields from the original name. If there is no reference to this in the original name, it will consider these to be at Present scenario.

usage: `rename_epw_files(filelist=list_of_files_to_rename, # if omitted, it will rename all EPWs in that folder confirm_renaming=True or False, #to skip renaming confirmation on prompt command or console confirm_deletion=True or False #to skip deletion confirmation on prompt command or console match_cities: True or False. Default is False. It's computationally very expensive.)`

First of all, let's see what files we do have in the folder:

[1]:
```
import os
os.listdir()
```

[1]:
```
['.ipynb_checkpoints',
 'GBR_Aberdeen.Dyce.030910_IWEC.epw',
 'GBR_London.Gatwick.037760_IWEC.epw',
 'RCP26_2100_GC03_Ponta_Grossa.epw',
 'using_rename_epw_files.ipynb',
 '__init__.py']
```

You can see there are 3 EPW files, which are:

[2]:
```
old_epws = [i for i in os.listdir() if i.endswith('.epw')]
print(old_epws)
```

```
['GBR_Aberdeen.Dyce.030910_IWEC.epw', 'GBR_London.Gatwick.037760_IWEC.epw', 'RCP26_2100_
↪GC03_Ponta_Grossa.epw']
```

So let's rename them. When we call the function, you will be asked to enter the IDs of the EPW names which are not correct, if there are any. If you enter one or multiple IDs, you will be asked if you want to rename them manually (i.e. typing the correct new name) or not. If you say 'n', possible names will be searched by using the geolocation, which can be computationally expensive if there are a moderate number of EPWs (e.g. 30).

[3]:
```
from accim.data.data_preprocessing import rename_epw_files
rename_epw_files(
    confirm_deletion=False,
)
```

```
C:\users\sanga\appdata\local\programs\python\python39\lib\site-packages\accim\data\data_
↪preprocessing.py:137: FutureWarning: The default value of regex will change from True␣
↪to False in a future version.
  epw_df['EPW_names'] = epw_df['EPW_file_names'].str.replace('.epw', '')
C:\users\sanga\appdata\local\programs\python\python39\lib\site-packages\accim\data\data_
↪preprocessing.py:139: FutureWarning: The default value of regex will change from True␣
↪to False in a future version. In addition, single character regular expressions␣
↪will*not* be treated as literal strings when regex=True.
  epw_df['EPW_mod'] = epw_df['EPW_names'].str.replace('-', '_').str.replace('.', '_').
↪str.split('_')
C:\users\sanga\appdata\local\programs\python\python39\lib\site-packages\accim\data\data_
↪preprocessing.py:141: FutureWarning: The default value of regex will change from True␣
↪to False in a future version. In addition, single character regular expressions␣
↪will*not* be treated as literal strings when regex=True.
  epw_df['EPW_mod_filtered'] = epw_df['EPW_names'].str.replace('-', '_').str.replace('.',
↪ '_').str.split('_')
Since no match has been found between RCP scenarios and EPW file name, Present scenario␣
↪has been assigned to the following EPW files:
GBR_Aberdeen.Dyce.030910_IWEC.epw
GBR_London.Gatwick.037760_IWEC.epw
Since no match has been found between RCP scenario Year and EPW file name, Present year␣
↪has been assigned to the following EPW files:
GBR_Aberdeen.Dyce.030910_IWEC.epw
GBR_London.Gatwick.037760_IWEC.epw
The geolocation process has taken: 1.36 seconds (0.45 s/EPW)

The previous and new names of the EPW files and their unique IDs are:
ID: 0 / GBR_Aberdeen.Dyce.030910_IWEC / United-Kingdom_Aberdeen_Present
ID: 1 / GBR_London.Gatwick.037760_IWEC / United-Kingdom_UNKNOWN_Present
ID: 2 / RCP26_2100_GC03_Ponta_Grossa / Brazil_Ponta_RCP26-2100

"UNKNOWN" city or subcountry have been found in the renamed EPW files, therefore these␣
↪need to be amended in the next stage.

If any of the city or subcountry names needs some amendment (if you are not happy with␣
↪any of the available options, you can exclude it from renaming at the next stage),␣
↪please enter the EPW IDs separated by space; otherwise, hit enter to omit:2

Regarding the file ID: 1 / old name: GBR_London.Gatwick.037760_IWEC / new name: United-
↪Kingdom_UNKNOWN_Present, the address obtained from coordinates is:
London Gatwick Airport, Old Brighton Road South, Lowfield Heath, Manor Royal, Crawley,␣
↪West Sussex, GB-WSX, England, GB-ENG, RH11 0PT, United Kingdom
Please enter the amended city or subcountry, which must be unique: London

Regarding the file ID: 2 / old name: RCP26_2100_GC03_Ponta_Grossa / new name: Brazil_
↪Ponta_RCP26-2100, the address obtained from coordinates is:
Praca Barao de Guarauna, Centro, Centro, Ponta Grossa, Regiao Geografica Imediata de␣
↪Ponta Grossa, Regiao Geografica Intermediaria de Ponta Grossa, Parana, BR-PR, Regiao␣
↪Sul, 84010-050, Brasil
Please enter the amended city or subcountry, which must be unique: Ponta Grossa

The previous and new names of the EPW files after city or subcountry name amendments and␣
```

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```
↪their unique IDs are:
ID: 1 / GBR_London.Gatwick.037760_IWEC / United-Kingdom_London_Present
ID: 2 / RCP26_2100_GC03_Ponta_Grossa / Brazil_Ponta-Grossa_RCP26-2100

The final list of previous and new names of the EPW files and their unique IDs is:
ID: 0 / GBR_Aberdeen.Dyce.030910_IWEC / United-Kingdom_Aberdeen_Present
ID: 1 / GBR_London.Gatwick.037760_IWEC / United-Kingdom_London_Present
ID: 2 / RCP26_2100_GC03_Ponta_Grossa / Brazil_Ponta-Grossa_RCP26-2100

If you want to exclude some EPWs from renaming, please enter the IDs separated by space,␣
↪otherwise, hit enter to continue:

Do you want to copy and rename the file or files? [y/n]:y
The file GBR_Aberdeen.Dyce.030910_IWEC has been renamed to United-Kingdom_Aberdeen_
↪Present
The file GBR_London.Gatwick.037760_IWEC has been renamed to United-Kingdom_London_Present
The file RCP26_2100_GC03_Ponta_Grossa has been renamed to Brazil_Ponta-Grossa_RCP26-2100
```

[3]:
```
<accim.data.data_preprocessing.rename_epw_files at 0x28b783abcd0>
```

You can see above that there was no reference to RCP scenarios in the original EPW file name in 2 of the instances, therefore these has been considered as Present scenario. The same applies to the Year field. Finally, states the previous and the new names of the EPWs. So, now, let's see what files we do have in the folder.

[4]:
```
os.listdir()
```

[4]:
```
['.ipynb_checkpoints',
 'Brazil_Ponta-Grossa_RCP26-2100.epw',
 'GBR_Aberdeen.Dyce.030910_IWEC.epw',
 'GBR_London.Gatwick.037760_IWEC.epw',
 'RCP26_2100_GC03_Ponta_Grossa.epw',
 'United-Kingdom_Aberdeen_Present.epw',
 'United-Kingdom_London_Present.epw',
 'using_rename_epw_files.ipynb',
 '__init__.py']
```

We can see the new EPWs are:

[5]:
```
new_epws = [i for i in os.listdir() if not(any(i in j for j in old_epws)) and i.endswith(
↪'.epw')]
print(new_epws)
```

```
['Brazil_Ponta-Grossa_RCP26-2100.epw', 'United-Kingdom_Aberdeen_Present.epw', 'United-
↪Kingdom_London_Present.epw']
```

Let's delete the new files so that we can run the notebook again.

[6]:
```
for i in new_epws:
    os.remove(i)
```

CHAPTER

ELEVEN

USING `RUNEP()` TO DIRECTLY RUN SIMULATIONS WITH ENERGYPLUS

This script has been created by eppy's development team (https://eppy.readthedocs.io/en/latest/runningeplus.html, specifically from section 'Running in parallel processes using Generators'), however I did some changes. Anyway, you probably should check out eppy package, since it's absolutely awesome.

This script will take all EPWs and IDFs located in the folder where the script is being executed as input files, and will run simulations based on these, naming the output files with the following naming convention: "IDFname[EPWname"

First of all, let's see what files we do have in the folder:

[1]:
```
import os
original_files = [i for i in os.listdir()]
print(*original_files, sep='\n')
```

```
.ipynb_checkpoints
TestModel_V2310[CS_INT ASHRAE55[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.
↪idf
United-Kingdom_Aberdeen_Present.epw
using_runEp.ipynb
__init__.py
```

As you can see, the EPW file or files we have is or are:

[2]:
```
print([i for i in original_files if i.endswith('.epw')])
```

```
['United-Kingdom_Aberdeen_Present.epw']
```

And the IDF file or files we have is or are:

[3]:
```
print([i for i in original_files if i.endswith('.idf')])
```

```
['TestModel_V2310[CS_INT ASHRAE55[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_
↪X.idf']
```

Based on that, let's use `runEp()`:

[4]:
```
from accim.run import run
run.runEp(
    runOnlyAccim=True, #only runs output IDFs, that is, IDFs with "[" in its name
    confirmRun=True, #to skip confirmation
    num_CPUs=2, #to specify the number of CPUs to be used
    EnergyPlus_version='23.1', #to specify the EnergyPlus version of the IDF, and the␣
↪version of EnergyPlus you are going to run
)
```

```
The IDFs we are going to run are:
TestModel_V2310[CS_INT ASHRAE55[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_X.
↪idf
 and the No. of IDFs is going to be 1
The sample_EPWs we are going to run are:
United-Kingdom_Aberdeen_Present.epw
 and the No. of sample_EPWs is going to be 1
Therefore, the simulations are going to be:
TestModel_V2310[CS_INT ASHRAE55[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_
↪X[United-Kingdom_Aberdeen_Present
 and the No. of simulations is going to be 1
```

runEp() just informed us about the input files, and the number of simulation runs and name of each one. So now, let's see what are the outputs:

[5]:
```
new_files = [i for i in os.listdir() if not(any(i in j for j in original_files))]
print(*new_files, sep='\n')
```

```
TestModel_V2310[CS_INT ASHRAE55[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_
↪X[United-Kingdom_Aberdeen_Present.audit
TestModel_V2310[CS_INT ASHRAE55[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_
↪X[United-Kingdom_Aberdeen_Present.bnd
TestModel_V2310[CS_INT ASHRAE55[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_
↪X[United-Kingdom_Aberdeen_Present.csv
TestModel_V2310[CS_INT ASHRAE55[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_
↪X[United-Kingdom_Aberdeen_Present.dxf
TestModel_V2310[CS_INT ASHRAE55[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_
↪X[United-Kingdom_Aberdeen_Present.eio
TestModel_V2310[CS_INT ASHRAE55[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_
↪X[United-Kingdom_Aberdeen_Present.end
TestModel_V2310[CS_INT ASHRAE55[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_
↪X[United-Kingdom_Aberdeen_Present.err
TestModel_V2310[CS_INT ASHRAE55[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_
↪X[United-Kingdom_Aberdeen_Present.eso
TestModel_V2310[CS_INT ASHRAE55[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_
↪X[United-Kingdom_Aberdeen_Present.mdd
TestModel_V2310[CS_INT ASHRAE55[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_
↪X[United-Kingdom_Aberdeen_Present.mtd
TestModel_V2310[CS_INT ASHRAE55[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_
↪X[United-Kingdom_Aberdeen_Present.rdd
TestModel_V2310[CS_INT ASHRAE55[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_
↪X[United-Kingdom_Aberdeen_Present.rvaudit
TestModel_V2310[CS_INT ASHRAE55[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_
↪X[United-Kingdom_Aberdeen_Present.shd
TestModel_V2310[CS_INT ASHRAE55[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_
↪X[United-Kingdom_Aberdeen_PresentTable.csv
TestModel_V2310[CS_INT ASHRAE55[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_
↪X[United-Kingdom_Aberdeen_PresentTable.htm
TestModel_V2310[CS_INT ASHRAE55[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_
↪X[United-Kingdom_Aberdeen_PresentZsz.csv
```

The CSV files we have generated follow the naming convention 'IDF[EPW' and therefore, are suitable to be used with the class Table, within the accim.data.datawrangling module.

[6]:
```
print(*[i for i in os.listdir() if i.endswith('.csv') and not(i.endswith('Table.csv'))␣
↪and not (i.endswith('Zsz.csv'))], sep='\n')
```

```
TestModel_V2310[CS_INT ASHRAE55[CA_80[CM_3[HM_2[VC_0[VO_0.0[MT_50.0[MW_50.0[AT_0.1[NS_
↪X[United-Kingdom_Aberdeen_Present.csv
```

Now, let's remove all output files of the simulation run:

[7]:
```
for i in new_files:
    os.remove(i)
```

CHAPTER

TWELVE

USING THE CLASS TABLE() FOR DATA ANALYSIS

Say we have previously renamed the EPW files with rename_epw_files(), and the EPWs we currently have are:

- United-Kingdom_Aberdeen_Present
- United-Kingdom_London_Present

We also have transformed the IDF file TestModel_onlyGeometryForVRFsystem_2zones_CalcVent_V2220.idf, and the IDFs we currently have are:

- TestModel[CS_INT EN16798[CA_1[CM_0[HM_2[VC_0[VO_0[MT_50[MW_50[AT_0.1[NS_X.idf
- TestModel[CS_INT EN16798[CA_1[CM_3[HM_2[VC_0[VO_0[MT_50[MW_50[AT_0.1[NS_X.idf
- TestModel[CS_INT EN16798[CA_2[CM_0[HM_2[VC_0[VO_0[MT_50[MW_50[AT_0.1[NS_X.idf
- TestModel[CS_INT EN16798[CA_2[CM_3[HM_2[VC_0[VO_0[MT_50[MW_50[AT_0.1[NS_X.idf
- TestModel[CS_INT EN16798[CA_3[CM_0[HM_2[VC_0[VO_0[MT_50[MW_50[AT_0.1[NS_X.idf
- TestModel[CS_INT EN16798[CA_3[CM_3[HM_2[VC_0[VO_0[MT_50[MW_50[AT_0.1[NS_X.idf

Next, we simulate these files with runEp(), so the CSVs we get are:

[1]:
```
import os
print(*[i for i in os.listdir() if i.endswith('.csv') and 'TestModel' in i], sep='\n')
```

```
TestModel[CS_INT EN16798[CA_1[CM_0[HM_2[VC_0[VO_0[MT_50[MW_50[AT_0.1[NS_X[United-Kingdom_
↪Aberdeen_Present.csv
TestModel[CS_INT EN16798[CA_1[CM_0[HM_2[VC_0[VO_0[MT_50[MW_50[AT_0.1[NS_X[United-Kingdom_
↪London_Present.csv
TestModel[CS_INT EN16798[CA_1[CM_3[HM_2[VC_0[VO_0[MT_50[MW_50[AT_0.1[NS_X[United-Kingdom_
↪Aberdeen_Present.csv
TestModel[CS_INT EN16798[CA_1[CM_3[HM_2[VC_0[VO_0[MT_50[MW_50[AT_0.1[NS_X[United-Kingdom_
↪London_Present.csv
TestModel[CS_INT EN16798[CA_2[CM_0[HM_2[VC_0[VO_0[MT_50[MW_50[AT_0.1[NS_X[United-Kingdom_
↪Aberdeen_Present.csv
TestModel[CS_INT EN16798[CA_2[CM_0[HM_2[VC_0[VO_0[MT_50[MW_50[AT_0.1[NS_X[United-Kingdom_
↪London_Present.csv
TestModel[CS_INT EN16798[CA_2[CM_3[HM_2[VC_0[VO_0[MT_50[MW_50[AT_0.1[NS_X[United-Kingdom_
↪Aberdeen_Present.csv
TestModel[CS_INT EN16798[CA_2[CM_3[HM_2[VC_0[VO_0[MT_50[MW_50[AT_0.1[NS_X[United-Kingdom_
↪London_Present.csv
TestModel[CS_INT EN16798[CA_3[CM_0[HM_2[VC_0[VO_0[MT_50[MW_50[AT_0.1[NS_X[United-Kingdom_
↪Aberdeen_Present.csv
TestModel[CS_INT EN16798[CA_3[CM_0[HM_2[VC_0[VO_0[MT_50[MW_50[AT_0.1[NS_X[United-Kingdom_
↪London_Present.csv
```

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```
TestModel[CS_INT EN16798[CA_3[CM_3[HM_2[VC_0[VO_0[MT_50[MW_50[AT_0.1[NS_X[United-Kingdom_
↪Aberdeen_Present.csv
TestModel[CS_INT EN16798[CA_3[CM_3[HM_2[VC_0[VO_0[MT_50[MW_50[AT_0.1[NS_X[United-Kingdom_
↪London_Present.csv
```

So now, let's use the class Table() to analyse the data.

12.1 1. Getting the full dataset of simulation results

[2]:
```
from accim.data.data_postprocessing import Table
dataset_hourly = Table(
    #datasets=list #Since we are not specifying any list, it will use all available CSVs␣
↪in the folder
    source_frequency='hourly', # This lets accim know which is the frequency of the␣
↪input CSVs. Input CSVs with multiple frequencies are also allowed. It can be 'hourly',
↪'daily', 'monthly' and 'runperiod'. It can also be 'timestep' but might generate␣
↪errors.
    frequency='hourly', # If 'daily', accim will aggregate the rows in days. It can be
↪'hourly', 'daily', 'monthly' and 'runperiod'. It can also be 'timestep' but might␣
↪generate errors.
    frequency_agg_func='sum', #this makes the sum or average when aggregating in days,␣
↪months or runperiod; since the original CSV frequency is in hour, it won't make any␣
↪aeffect
    standard_outputs=True,
    level=['building'], # A list containing the strings 'block' and/or 'building'. For␣
↪instance, if ['block', 'building'], accim will generate new columns to sum up or␣
↪average in blocks and building level.
    level_agg_func=['sum', 'mean'], # A list containing the strings 'sum' and/or 'mean'.␣
↪For instance, if ['sum', 'mean'], accim will generate the new columns explained in the␣
↪level argument by summing and averaging.
    level_excluded_zones=[],
    split_epw_names=True, #to split EPW names based on the pattern Country_City_
↪RCPscenario-Year
)
```

```
Input data frequency in file TestModel[CS_INT EN16798[CA_1[CM_0[HM_2[VC_0[VO_0[MT_50[MW_
↪50[AT_0.1[NS_X[United-Kingdom_Aberdeen_Present.csv is hourly, therefore no aggregation␣
↪will be performed.
Input data frequency in file TestModel[CS_INT EN16798[CA_1[CM_0[HM_2[VC_0[VO_0[MT_50[MW_
↪50[AT_0.1[NS_X[United-Kingdom_London_Present.csv is hourly, therefore no aggregation␣
↪will be performed.
Input data frequency in file TestModel[CS_INT EN16798[CA_1[CM_3[HM_2[VC_0[VO_0[MT_50[MW_
↪50[AT_0.1[NS_X[United-Kingdom_Aberdeen_Present.csv is hourly, therefore no aggregation␣
↪will be performed.
Input data frequency in file TestModel[CS_INT EN16798[CA_1[CM_3[HM_2[VC_0[VO_0[MT_50[MW_
↪50[AT_0.1[NS_X[United-Kingdom_London_Present.csv is hourly, therefore no aggregation␣
↪will be performed.
Input data frequency in file TestModel[CS_INT EN16798[CA_2[CM_0[HM_2[VC_0[VO_0[MT_50[MW_
↪50[AT_0.1[NS_X[United-Kingdom_Aberdeen_Present.csv is hourly, therefore no aggregation␣
↪will be performed.
Input data frequency in file TestModel[CS_INT EN16798[CA_2[CM_0[HM_2[VC_0[VO_0[MT_50[MW_
```

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```
↪50[AT_0.1[NS_X[United-Kingdom_London_Present.csv is hourly, therefore no aggregation␣
↪will be performed.
Input data frequency in file TestModel[CS_INT EN16798[CA_2[CM_3[HM_2[VC_0[VO_0[MT_50[MW_
↪50[AT_0.1[NS_X[United-Kingdom_Aberdeen_Present.csv is hourly, therefore no aggregation␣
↪will be performed.
Input data frequency in file TestModel[CS_INT EN16798[CA_2[CM_3[HM_2[VC_0[VO_0[MT_50[MW_
↪50[AT_0.1[NS_X[United-Kingdom_London_Present.csv is hourly, therefore no aggregation␣
↪will be performed.
Input data frequency in file TestModel[CS_INT EN16798[CA_3[CM_0[HM_2[VC_0[VO_0[MT_50[MW_
↪50[AT_0.1[NS_X[United-Kingdom_Aberdeen_Present.csv is hourly, therefore no aggregation␣
↪will be performed.
Input data frequency in file TestModel[CS_INT EN16798[CA_3[CM_0[HM_2[VC_0[VO_0[MT_50[MW_
↪50[AT_0.1[NS_X[United-Kingdom_London_Present.csv is hourly, therefore no aggregation␣
↪will be performed.
Input data frequency in file TestModel[CS_INT EN16798[CA_3[CM_3[HM_2[VC_0[VO_0[MT_50[MW_
↪50[AT_0.1[NS_X[United-Kingdom_Aberdeen_Present.csv is hourly, therefore no aggregation␣
↪will be performed.
Input data frequency in file TestModel[CS_INT EN16798[CA_3[CM_3[HM_2[VC_0[VO_0[MT_50[MW_
↪50[AT_0.1[NS_X[United-Kingdom_London_Present.csv is hourly, therefore no aggregation␣
↪will be performed.
No zones have been excluded from level computations.
All CSVs are for present scenario.
```

A Table object has been created, which includes a number of accessible variables. The most important is the Pandas Dataframe created from the CSVs, which can be accessed with .df (in this case, dataset_hourly.df)

[3]:
```
dataset_hourly.df
```

[3]:

	Source	Model	\
0	TestModel[CS_INT EN16798[CA_1[CM_0[HM_2[VC_0[V...	TestModel	
1	TestModel[CS_INT EN16798[CA_1[CM_0[HM_2[VC_0[V...	TestModel	
2	TestModel[CS_INT EN16798[CA_1[CM_0[HM_2[VC_0[V...	TestModel	
3	TestModel[CS_INT EN16798[CA_1[CM_0[HM_2[VC_0[V...	TestModel	
4	TestModel[CS_INT EN16798[CA_1[CM_0[HM_2[VC_0[V...	TestModel	
...	...	...	
105115	TestModel[CS_INT EN16798[CA_3[CM_3[HM_2[VC_0[V...	TestModel	
105116	TestModel[CS_INT EN16798[CA_3[CM_3[HM_2[VC_0[V...	TestModel	
105117	TestModel[CS_INT EN16798[CA_3[CM_3[HM_2[VC_0[V...	TestModel	
105118	TestModel[CS_INT EN16798[CA_3[CM_3[HM_2[VC_0[V...	TestModel	
105119	TestModel[CS_INT EN16798[CA_3[CM_3[HM_2[VC_0[V...	TestModel	

	ComfStand	CAT	ComfMod	HVACmode	VentCtrl	VSToffset	MinOToffset	\
0	CS_INT EN16798	CA_1	CM_0	HM_2	VC_0	VO_0	MT_50	
1	CS_INT EN16798	CA_1	CM_0	HM_2	VC_0	VO_0	MT_50	
2	CS_INT EN16798	CA_1	CM_0	HM_2	VC_0	VO_0	MT_50	
3	CS_INT EN16798	CA_1	CM_0	HM_2	VC_0	VO_0	MT_50	
4	CS_INT EN16798	CA_1	CM_0	HM_2	VC_0	VO_0	MT_50	
...	...	...	...	...	...	...	...	
105115	CS_INT EN16798	CA_3	CM_3	HM_2	VC_0	VO_0	MT_50	
105116	CS_INT EN16798	CA_3	CM_3	HM_2	VC_0	VO_0	MT_50	
105117	CS_INT EN16798	CA_3	CM_3	HM_2	VC_0	VO_0	MT_50	
105118	CS_INT EN16798	CA_3	CM_3	HM_2	VC_0	VO_0	MT_50	
105119	CS_INT EN16798	CA_3	CM_3	HM_2	VC_0	VO_0	MT_50	

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```
       MaxWindSpeed  ... Building_Total_Total Energy Demand (kWh/m2) (summed)  \
0             MW_50  ...                                              0.036738
1             MW_50  ...                                              0.040240
2             MW_50  ...                                              0.042701
3             MW_50  ...                                              0.044282
4             MW_50  ...                                              0.045109
...             ...  ...                                                   ...
105115        MW_50  ...                                              0.011349
105116        MW_50  ...                                              0.011955
105117        MW_50  ...                                              0.012974
105118        MW_50  ...                                              0.015072
105119        MW_50  ...                                              0.017182

       Building_Total_Total Energy Demand (kWh/m2) (mean)  \
0                                                0.009185
1                                                0.010060
2                                                0.010675
3                                                0.011071
4                                                0.011277
...                                                   ...
105115                                           0.002837
105116                                           0.002989
105117                                           0.003243
105118                                           0.003768
105119                                           0.004295

       Building_Total_Total Energy Consumption (kWh/m2) (summed)  \
0                                                0.030576
1                                                0.034616
2                                                0.037389
3                                                0.039079
4                                                0.039927
...                                                   ...
105115                                           0.007941
105116                                           0.008373
105117                                           0.009094
105118                                           0.010571
105119                                           0.012108

        Building_Total_Total Energy Consumption (kWh/m2) (mean)  \
0                                                0.007644
1                                                0.008654
2                                                0.009347
3                                                0.009770
4                                                0.009982
...                                                   ...
105115                                           0.001985
105116                                           0.002093
105117                                           0.002273
105118                                           0.002643
105119                                           0.003027
```

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```
       Building_Total_Zone Air Volume (m3) (summed)  \
0                                          232.0401
1                                          232.0401
2                                          232.0401
3                                          232.0401
4                                          232.0401
...                                             ...
105115                                     232.0401
105116                                     232.0401
105117                                     232.0401
105118                                     232.0401
105119                                     232.0401

       Building_Total_Zone Floor Area (m2) (summed)  \
0                                           66.2971
1                                           66.2971
2                                           66.2971
3                                           66.2971
4                                           66.2971
...                                             ...
105115                                      66.2971
105116                                      66.2971
105117                                      66.2971
105118                                      66.2971
105119                                      66.2971

       Building_Total_PMV (summed) Building_Total_PMV (mean)  \
0                              0.0                       NaN
1                              0.0                       NaN
2                              0.0                       NaN
3                              0.0                       NaN
4                              0.0                       NaN
...                            ...                       ...
105115                         0.0                       NaN
105116                         0.0                       NaN
105117                         0.0                       NaN
105118                         0.0                       NaN
105119                         0.0                       NaN

       Building_Total_PPD (%) (summed) Building_Total_PPD (%) (mean)
0                                  0.0                           NaN
1                                  0.0                           NaN
2                                  0.0                           NaN
3                                  0.0                           NaN
4                                  0.0                           NaN
...                                ...                           ...
105115                             0.0                           NaN
105116                             0.0                           NaN
105117                             0.0                           NaN
105118                             0.0                           NaN
105119                             0.0                           NaN
```

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```
[105120 rows x 119 columns]
```

[4]:
```
dataset_hourly.df.shape
```

[4]:
```
(105120, 119)
```

Also, you can see the block list that has been extracted from the zones in the CSV columns, as well as the zones with heating or cooling energy consumption, and the occupied zones:

[5]:
```
dataset_hourly.block_list
```

[5]:
```
['BLOCK1']
```

[6]:
```
dataset_hourly.hvac_zone_list
```

[6]:
```
['BLOCK1:ZONE2', 'BLOCK1:ZONE1']
```

[7]:
```
dataset_hourly.occupied_zone_list
```

[7]:
```
['BLOCK1:ZONE2', 'BLOCK1:ZONE1']
```

In case of lots of CSVs, using the Table class would mean gathering the CSVs to make the Dataframe each time, and it might be very time-consuming. Therefore, the CSVs can be concatenated into a single CSV and store in the same folder with the argument concatenated_csv_name. Afterwards, that concatenated CSV can be read using the argument source_concatenated_csv_filepath each time a Table class object is created.

[8]:
```
concatenated_csvname = 'notebook_example'
dataset_hourly_indirect = Table(
    #datasets=list #Since we are not specifying any list, it will use all available CSVs␣
↪in the folder
    source_frequency='hourly', # This lets accim know which is the frequency of the␣
↪input CSVs. Input CSVs with multiple frequencies are also allowed. It can be 'hourly',
↪'daily', 'monthly' and 'runperiod'. It can also be 'timestep' but might generate␣
↪errors.
    frequency='hourly', # If 'daily', accim will aggregate the rows in days. It can be
↪'hourly', 'daily', 'monthly' and 'runperiod'. It can also be 'timestep' but might␣
↪generate errors.
    frequency_agg_func='sum', #this makes the sum or average when aggregating in days,␣
↪months or runperiod; since the original CSV frequency is in hour, it won't make any␣
↪aeffect
    standard_outputs=True,
    concatenated_csv_name=concatenated_csvname #Useful when working with large datasets.␣
↪It saves the output dataset to a CSV file, so you don't need to re-do some work.␣
↪Afterwards, it can be imported with source_concatenated_csv_filepath argument.
    # All other arguments won't have any effect on the output. This is only to store the␣
↪csv at early stage. Datawrangling will be performed later.

)
```

```
Input data frequency in file TestModel[CS_INT EN16798[CA_1[CM_0[HM_2[VC_0[VO_0[MT_50[MW_
↪50[AT_0.1[NS_X[United-Kingdom_Aberdeen_Present.csv is hourly, therefore no aggregation␣
↪will be performed.
Input data frequency in file TestModel[CS_INT EN16798[CA_1[CM_0[HM_2[VC_0[VO_0[MT_50[MW_
```

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```
↪50[AT_0.1[NS_X[United-Kingdom_London_Present.csv is hourly, therefore no aggregation␣
↪will be performed.
Input data frequency in file TestModel[CS_INT EN16798[CA_1[CM_3[HM_2[VC_0[VO_0[MT_50[MW_
↪50[AT_0.1[NS_X[United-Kingdom_Aberdeen_Present.csv is hourly, therefore no aggregation␣
↪will be performed.
Input data frequency in file TestModel[CS_INT EN16798[CA_1[CM_3[HM_2[VC_0[VO_0[MT_50[MW_
↪50[AT_0.1[NS_X[United-Kingdom_London_Present.csv is hourly, therefore no aggregation␣
↪will be performed.
Input data frequency in file TestModel[CS_INT EN16798[CA_2[CM_0[HM_2[VC_0[VO_0[MT_50[MW_
↪50[AT_0.1[NS_X[United-Kingdom_Aberdeen_Present.csv is hourly, therefore no aggregation␣
↪will be performed.
Input data frequency in file TestModel[CS_INT EN16798[CA_2[CM_0[HM_2[VC_0[VO_0[MT_50[MW_
↪50[AT_0.1[NS_X[United-Kingdom_London_Present.csv is hourly, therefore no aggregation␣
↪will be performed.
Input data frequency in file TestModel[CS_INT EN16798[CA_2[CM_3[HM_2[VC_0[VO_0[MT_50[MW_
↪50[AT_0.1[NS_X[United-Kingdom_Aberdeen_Present.csv is hourly, therefore no aggregation␣
↪will be performed.
Input data frequency in file TestModel[CS_INT EN16798[CA_2[CM_3[HM_2[VC_0[VO_0[MT_50[MW_
↪50[AT_0.1[NS_X[United-Kingdom_London_Present.csv is hourly, therefore no aggregation␣
↪will be performed.
Input data frequency in file TestModel[CS_INT EN16798[CA_3[CM_0[HM_2[VC_0[VO_0[MT_50[MW_
↪50[AT_0.1[NS_X[United-Kingdom_Aberdeen_Present.csv is hourly, therefore no aggregation␣
↪will be performed.
Input data frequency in file TestModel[CS_INT EN16798[CA_3[CM_0[HM_2[VC_0[VO_0[MT_50[MW_
↪50[AT_0.1[NS_X[United-Kingdom_London_Present.csv is hourly, therefore no aggregation␣
↪will be performed.
Input data frequency in file TestModel[CS_INT EN16798[CA_3[CM_3[HM_2[VC_0[VO_0[MT_50[MW_
↪50[AT_0.1[NS_X[United-Kingdom_Aberdeen_Present.csv is hourly, therefore no aggregation␣
↪will be performed.
Input data frequency in file TestModel[CS_INT EN16798[CA_3[CM_3[HM_2[VC_0[VO_0[MT_50[MW_
↪50[AT_0.1[NS_X[United-Kingdom_London_Present.csv is hourly, therefore no aggregation␣
↪will be performed.
```

We just generated a CSV, whose name begins with 'notebook example', specifies the input data and ends with 'CSV-concatenated'. If there is some row with NaN, it will be generated another CSV reporting this, but ending with 'Rows_with_NaNs'. We should be able to see it below:

[9]:
```
import os
os.listdir()
```

[9]:
```
['.ipynb_checkpoints',
 'notebook_example[srcfreq-hourly[freq-hourly[frequency_agg_func-sum[standard_outputs-
↪True[CSVconcatenated.csv',
 'TestModel[CS_INT EN16798[CA_1[CM_0[HM_2[VC_0[VO_0[MT_50[MW_50[AT_0.1[NS_X[United-
↪Kingdom_Aberdeen_Present.csv',
 'TestModel[CS_INT EN16798[CA_1[CM_0[HM_2[VC_0[VO_0[MT_50[MW_50[AT_0.1[NS_X[United-
↪Kingdom_London_Present.csv',
 'TestModel[CS_INT EN16798[CA_1[CM_3[HM_2[VC_0[VO_0[MT_50[MW_50[AT_0.1[NS_X[United-
↪Kingdom_Aberdeen_Present.csv',
 'TestModel[CS_INT EN16798[CA_1[CM_3[HM_2[VC_0[VO_0[MT_50[MW_50[AT_0.1[NS_X[United-
↪Kingdom_London_Present.csv',
 'TestModel[CS_INT EN16798[CA_2[CM_0[HM_2[VC_0[VO_0[MT_50[MW_50[AT_0.1[NS_X[United-
↪Kingdom_Aberdeen_Present.csv',
```

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```
 'TestModel[CS_INT EN16798[CA_2[CM_0[HM_2[VC_0[VO_0[MT_50[MW_50[AT_0.1[NS_X[United-
↪Kingdom_London_Present.csv',
 'TestModel[CS_INT EN16798[CA_2[CM_3[HM_2[VC_0[VO_0[MT_50[MW_50[AT_0.1[NS_X[United-
↪Kingdom_Aberdeen_Present.csv',
 'TestModel[CS_INT EN16798[CA_2[CM_3[HM_2[VC_0[VO_0[MT_50[MW_50[AT_0.1[NS_X[United-
↪Kingdom_London_Present.csv',
 'TestModel[CS_INT EN16798[CA_3[CM_0[HM_2[VC_0[VO_0[MT_50[MW_50[AT_0.1[NS_X[United-
↪Kingdom_Aberdeen_Present.csv',
 'TestModel[CS_INT EN16798[CA_3[CM_0[HM_2[VC_0[VO_0[MT_50[MW_50[AT_0.1[NS_X[United-
↪Kingdom_London_Present.csv',
 'TestModel[CS_INT EN16798[CA_3[CM_3[HM_2[VC_0[VO_0[MT_50[MW_50[AT_0.1[NS_X[United-
↪Kingdom_Aberdeen_Present.csv',
 'TestModel[CS_INT EN16798[CA_3[CM_3[HM_2[VC_0[VO_0[MT_50[MW_50[AT_0.1[NS_X[United-
↪Kingdom_London_Present.csv',
 'using_Table.ipynb',
 '__init__.py']
```

Now, let's continue working with the CSVconcatenated we have generated:

[10]:
```
dataset_hourly_indirect = Table(
    source_concatenated_csv_filepath='notebook_example[srcfreq-hourly[freq-
↪hourly[frequency_agg_func-sum[standard_outputs-True[CSVconcatenated.csv',
    # source_frequency='hourly', # The new source frequency is the previous already␣
↪computed frequency, since we have already aggregated rows based on the previous␣
↪frequency. Therefore, there is no need to specify this argument.
    # 3 arguments below have been previously specified, and in fact, are stored at the␣
↪concatenated CSV filename. So you don't need to specify these again.
    # frequency='hourly',
    # frequency_agg_func='sum',
    # standard_outputs=True,
    level=['building'],
    level_agg_func=['sum', 'mean'],
    level_excluded_zones=[],
    split_epw_names=True, #to split EPW names based on the format Country_City_
↪RCPscenario-YEar

)
```

```
No zones have been excluded from level computations.
All CSVs are for present scenario.
```

[11]:
```
dataset_hourly_indirect.df.shape
```

[11]:
```
(105120, 119)
```

You can see we have obtained the same full dataset. Now, let's delete the concatenated CSV file to save some space.

[12]:
```
for i in os.listdir():
    if concatenated_csvname in i:
        os.remove(i)
```

12.2 2. Filtering results

We have used any of the 2 methods to obtain the full dataset of simulation results.

At this point, we should have decided what table or graph we intend to make, and therefore we should know what data we are going to show in it. In this case, we want to make a figure with different subplots, showing the different ComfMod values on the rows and the different EPW_City_or_subcountry values on the columns, and in each subplot, a scatter plot with the indoor operative temperature and adaptive heating and cooling setpoints on the y main axis (left spine), and on the secondary y axis, 2 different spines, one of them to show the heating and cooling energy demand, and the other one the air changes. However, let's say we just want to see the subplots for Category CA_3.

[13]:
```
print(*dataset_hourly.df.columns, sep='\n')
```

```
Source
Model
ComfStand
CAT
ComfMod
HVACmode
VentCtrl
VSToffset
MinOToffset
MaxWindSpeed
ASTtol
NameSuffix
EPW
Count
EPW_Country_name
EPW_City_or_subcountry
EPW_Scenario-Year
EPW_Scenario
EPW_Year
Date/time
Month/day
Month
Day
Hour
Minute
Second
Site Outdoor Air Drybulb Temperature (˚C)
Site Outdoor Air Relative Humidity (%)
Site Wind Speed (m/s)
Comfort Temperature (˚C)
Adaptive Cooling Setpoint Temperature (˚C)
Adaptive Heating Setpoint Temperature (˚C)
Adaptive Cooling Setpoint Temperature_No Tolerance (˚C)
Adaptive Heating Setpoint Temperature_No Tolerance (˚C)
Ventilation Setpoint Temperature (˚C)
Minimum Outdoor Temperature for ventilation (˚C)
BLOCK1:ZONE2_Comfortable Hours_No Applicability (h)
BLOCK1:ZONE1_Comfortable Hours_No Applicability (h)
BLOCK1:ZONE2_Comfortable Hours_Applicability (h)
BLOCK1:ZONE1_Comfortable Hours_Applicability (h)
BLOCK1:ZONE2_Discomfortable Applicable Hot Hours (h)
```

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```
BLOCK1:ZONE1_Discomfortable Applicable Hot Hours (h)
BLOCK1:ZONE2_Discomfortable Applicable Cold Hours (h)
BLOCK1:ZONE1_Discomfortable Applicable Cold Hours (h)
BLOCK1:ZONE2_Discomfortable Non Applicable Hot Hours (h)
BLOCK1:ZONE1_Discomfortable Non Applicable Hot Hours (h)
BLOCK1:ZONE2_Discomfortable Non Applicable Cold Hours (h)
BLOCK1:ZONE1_Discomfortable Non Applicable Cold Hours (h)
BLOCK1:ZONE2_Zone Floor Area (m2)
BLOCK1:ZONE1_Zone Floor Area (m2)
BLOCK1:ZONE2_Zone Air Volume (m3)
BLOCK1:ZONE1_Zone Air Volume (m3)
BLOCK1:ZONE2_Ventilation Hours (h)
BLOCK1:ZONE1_Ventilation Hours (h)
BLOCK1:ZONE2_Zone Operative Temperature (°C)
BLOCK1:ZONE1_Zone Operative Temperature (°C)
BLOCK1:ZONE2_AFN Zone Infiltration Volume (m3)
BLOCK1:ZONE2_AFN Zone Infiltration Air Change Rate (ach)
BLOCK1:ZONE1_AFN Zone Infiltration Volume (m3)
BLOCK1:ZONE1_AFN Zone Infiltration Air Change Rate (ach)
Whole Building Facility Total HVAC Electricity Demand Rate (kWh/m2)
BLOCK1:ZONE2_ASHRAE 55 Running mean outdoor temperature (°C)
BLOCK1:ZONE2_EN16798-1 Running mean outdoor temperature (°C)
BLOCK1:ZONE1_ASHRAE 55 Running mean outdoor temperature (°C)
BLOCK1:ZONE1_EN16798-1 Running mean outdoor temperature (°C)
BLOCK1:ZONE2_Cooling Energy Demand (kWh/m2)
BLOCK1:ZONE1_Cooling Energy Demand (kWh/m2)
BLOCK1:ZONE2_Heating Energy Demand (kWh/m2)
BLOCK1:ZONE1_Heating Energy Demand (kWh/m2)
BLOCK1:ZONE2_Cooling Energy Consumption (kWh/m2)
BLOCK1:ZONE2_Heating Energy Consumption (kWh/m2)
BLOCK1:ZONE1_Cooling Energy Consumption (kWh/m2)
BLOCK1:ZONE1_Heating Energy Consumption (kWh/m2)
BLOCK1:ZONE2_Total Energy Demand (kWh/m2) (summed)
BLOCK1:ZONE1_Total Energy Demand (kWh/m2) (summed)
BLOCK1:ZONE2_Total Energy Consumption (kWh/m2) (summed)
BLOCK1:ZONE1_Total Energy Consumption (kWh/m2) (summed)
Building_Total_Zone Operative Temperature (°C) (summed)
Building_Total_Zone Operative Temperature (°C) (mean)
Building_Total_Comfortable Hours_No Applicability (h) (summed)
Building_Total_Comfortable Hours_No Applicability (h) (mean)
Building_Total_Comfortable Hours_Applicability (h) (summed)
Building_Total_Comfortable Hours_Applicability (h) (mean)
Building_Total_Discomfortable Applicable Hot Hours (h) (summed)
Building_Total_Discomfortable Applicable Hot Hours (h) (mean)
Building_Total_Discomfortable Applicable Cold Hours (h) (summed)
Building_Total_Discomfortable Applicable Cold Hours (h) (mean)
Building_Total_Discomfortable Non Applicable Hot Hours (h) (summed)
Building_Total_Discomfortable Non Applicable Hot Hours (h) (mean)
Building_Total_Discomfortable Non Applicable Cold Hours (h) (summed)
Building_Total_Discomfortable Non Applicable Cold Hours (h) (mean)
Building_Total_Ventilation Hours (h) (summed)
Building_Total_Ventilation Hours (h) (mean)
```

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```
Building_Total_AFN Zone Infiltration Volume (m3) (summed)
Building_Total_AFN Zone Infiltration Volume (m3) (mean)
Building_Total_AFN Zone Infiltration Air Change Rate (ach) (summed)
Building_Total_AFN Zone Infiltration Air Change Rate (ach) (mean)
Building_Total_AFN Zone Ventilation Volume (m3) (summed)
Building_Total_AFN Zone Ventilation Volume (m3) (mean)
Building_Total_AFN Zone Ventilation Air Change Rate (ach) (summed)
Building_Total_AFN Zone Ventilation Air Change Rate (ach) (mean)
Building_Total_Cooling Energy Demand (kWh/m2) (summed)
Building_Total_Cooling Energy Demand (kWh/m2) (mean)
Building_Total_Heating Energy Demand (kWh/m2) (summed)
Building_Total_Heating Energy Demand (kWh/m2) (mean)
Building_Total_Cooling Energy Consumption (kWh/m2) (summed)
Building_Total_Cooling Energy Consumption (kWh/m2) (mean)
Building_Total_Heating Energy Consumption (kWh/m2) (summed)
Building_Total_Heating Energy Consumption (kWh/m2) (mean)
Building_Total_Total Energy Demand (kWh/m2) (summed)
Building_Total_Total Energy Demand (kWh/m2) (mean)
Building_Total_Total Energy Consumption (kWh/m2) (summed)
Building_Total_Total Energy Consumption (kWh/m2) (mean)
Building_Total_Zone Air Volume (m3) (summed)
Building_Total_Zone Floor Area (m2) (summed)
Building_Total_PMV (summed)
Building_Total_PMV (mean)
Building_Total_PPD (%) (summed)
Building_Total_PPD (%) (mean)
```

Now, let's extract the data we are really interested in. For this, we can use the method called format_table():

[14]:
```
dataset_hourly.format_table(
    type_of_table='custom', # Used to choose some predefined tables. It can be 'energy␣
↪demand', 'comfort hours', 'temperature', 'all' or 'custom'
    custom_cols=[ #if type_of_table is 'custom', custom_cols is used to filter the␣
↪desired columns to keep
        'Adaptive Cooling Setpoint Temperature_No Tolerance (°C)',
        'Adaptive Heating Setpoint Temperature_No Tolerance (°C)',
        'Building_Total_Zone Operative Temperature (°C) (mean)',
        'BLOCK1:ZONE2_EN16798-1 Running mean outdoor temperature (°C)',
        'Building_Total_Cooling Energy Demand (kWh/m2) (summed)',
        'Building_Total_Heating Energy Demand (kWh/m2) (summed)',
        'Building_Total_AFN Zone Infiltration Air Change Rate (ach) (summed)'
    ]
)
```

So, we have already filtered the columns we wanted. Let's look at the result:

[15]:
```
dataset_hourly.df
```

[15]:
```
               Date/time      Model       ComfStand   CAT ComfMod HVACmode  \
0        01/01  01:00:00  TestModel  CS_INT EN16798  CA_1    CM_0     HM_2
1        01/01  02:00:00  TestModel  CS_INT EN16798  CA_1    CM_0     HM_2
2        01/01  03:00:00  TestModel  CS_INT EN16798  CA_1    CM_0     HM_2
3        01/01  04:00:00  TestModel  CS_INT EN16798  CA_1    CM_0     HM_2
```

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```
4        01/01  05:00:00  TestModel  CS_INT EN16798  CA_1    CM_0     HM_2
...                 ...        ...              ...   ...     ...      ...
105115   12/31  20:00:00  TestModel  CS_INT EN16798  CA_3    CM_3     HM_2
105116   12/31  21:00:00  TestModel  CS_INT EN16798  CA_3    CM_3     HM_2
105117   12/31  22:00:00  TestModel  CS_INT EN16798  CA_3    CM_3     HM_2
105118   12/31  23:00:00  TestModel  CS_INT EN16798  CA_3    CM_3     HM_2
105119   12/31  24:00:00  TestModel  CS_INT EN16798  CA_3    CM_3     HM_2

       VentCtrl VSToffset MinOToffset MaxWindSpeed  ... EPW_Scenario-Year  \
0          VC_0      VO_0       MT_50        MW_50  ...            Present
1          VC_0      VO_0       MT_50        MW_50  ...            Present
2          VC_0      VO_0       MT_50        MW_50  ...            Present
3          VC_0      VO_0       MT_50        MW_50  ...            Present
4          VC_0      VO_0       MT_50        MW_50  ...            Present
...         ...       ...         ...          ...  ...                ...
105115     VC_0      VO_0       MT_50        MW_50  ...            Present
105116     VC_0      VO_0       MT_50        MW_50  ...            Present
105117     VC_0      VO_0       MT_50        MW_50  ...            Present
105118     VC_0      VO_0       MT_50        MW_50  ...            Present
105119     VC_0      VO_0       MT_50        MW_50  ...            Present

       EPW_Scenario EPW_Year  \
0           Present  Present
1           Present  Present
2           Present  Present
3           Present  Present
4           Present  Present
...             ...      ...
105115      Present  Present
105116      Present  Present
105117      Present  Present
105118      Present  Present
105119      Present  Present

       Adaptive Cooling Setpoint Temperature_No Tolerance (°C)  \
0                                                         25.0
1                                                         25.0
2                                                         25.0
3                                                         25.0
4                                                         25.0
...                                                        ...
105115                                                    26.1
105116                                                    26.1
105117                                                    26.1
105118                                                    26.1
105119                                                    26.1

       Adaptive Heating Setpoint Temperature_No Tolerance (°C)  \
0                                                         21.0
1                                                         21.0
2                                                         21.0
3                                                         21.0
```

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```
4                                                    21.0
...                                                   ...
105115                                               17.1
105116                                               17.1
105117                                               17.1
105118                                               17.1
105119                                               17.1

       Building_Total_Zone Operative Temperature (°C) (mean)  \
0                                                 21.075965
1                                                 21.060730
2                                                 21.061641
3                                                 21.068896
4                                                 21.078253
...                                                     ...
105115                                            17.171267
105116                                            17.176058
105117                                            17.178160
105118                                            17.176237
105119                                            17.170725

       BLOCK1:ZONE2_EN16798-1 Running mean outdoor temperature (°C)  \
0                                                 -1.071071
1                                                 -1.071071
2                                                 -1.071071
3                                                 -1.071071
4                                                 -1.071071
...                                                     ...
105115                                             7.543148
105116                                             7.543148
105117                                             7.543148
105118                                             7.543148
105119                                             7.543148

       Building_Total_Cooling Energy Demand (kWh/m2) (summed)  \
0                                                    0.0
1                                                    0.0
2                                                    0.0
3                                                    0.0
4                                                    0.0
...                                                   ...
105115                                               0.0
105116                                               0.0
105117                                               0.0
105118                                               0.0
105119                                               0.0

       Building_Total_Heating Energy Demand (kWh/m2) (summed)  \
0                                                 0.036738
1                                                 0.040240
2                                                 0.042701
3                                                 0.044282
```

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```
4                                                    0.045109
...                                                       ...
105115                                               0.011349
105116                                               0.011955
105117                                               0.012974
105118                                               0.015072
105119                                               0.017182

       Building_Total_AFN Zone Infiltration Air Change Rate (ach) (summed)
0                                                    0.217716
1                                                    0.229646
2                                                    0.238609
3                                                    0.242288
4                                                    0.243261
...                                                       ...
105115                                               0.180364
105116                                               0.175023
105117                                               0.191868
105118                                               0.255266
105119                                               0.281407

[105120 rows x 29 columns]
```

As you can see, the number of columns have been reduced to 29, which are 22 columns for the index and categorical data, and the 7 columns we filtered.

12.3 3. Making graphs

We will make the figure with scatter_plot(), however it needs some input data we will previously generate with generate_fig_data().

12.3.1 3.1 Scatter plot:

As said above, we first need to generate the dataset lists with generate_fig_data():

And finally we can plot the figure:

[16]:
```
dataset_hourly.scatter_plot(
    vars_to_gather_rows=['ComfMod', 'CAT'], # variables to gather in rows of subplots
    vars_to_gather_cols=['EPW_City_or_subcountry'],# variables to gather in columns of␣
↪subplots
    detailed_rows=['CM_0[CA_3', 'CM_3[CA_3'], #we only want to see those combinations
    data_on_x_axis='BLOCK1:ZONE2_EN16798-1 Running mean outdoor temperature (°C)',
↪#column name (string) for the data on x axis

    data_on_y_main_axis=[ # similarly to above, a list including the name of the␣
↪secondary y-axis and the column names you want to plot in it
        [
            'Energy (kWh/m2)',
            [
```

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```
                'Building_Total_Cooling Energy Demand (kWh/m2) (summed)',
                'Building_Total_Heating Energy Demand (kWh/m2) (summed)',
            ]
        ],
    ],
    data_on_y_sec_axis=[ #list which includes the name of the axis on the first place, and then in the second place, a list which includes the column names you want to plot
        [
            'Air renovation (ach)',
            [
                'Building_Total_AFN Zone Infiltration Air Change Rate (ach) (summed)'
            ]
        ],
        [
            'Operative Temperature (°C)',
            [
                'Adaptive Cooling Setpoint Temperature_No Tolerance (°C)',
                'Adaptive Heating Setpoint Temperature_No Tolerance (°C)',
                'Building_Total_Zone Operative Temperature (°C) (mean)',
            ]
        ],
    ],

    colorlist_y_main_axis=[
        [
            'Energy (kWh/m2)',
            [
                'cyan',
                'orange',
            ]
        ],

    ],
    colorlist_y_sec_axis=[
        [
            'Air renovation (ach)',
            [
                'yellow'
            ]
        ],
        [
            'Operative Temperature (°C)',
            [
                'b',
                'r',
                'g',
            ]
        ],
    ],

    supxlabel='Running Mean Outdoor Temperature (°C)', # data label on x axis
    figname=f'WIP_scatterplot_RMOT',
```

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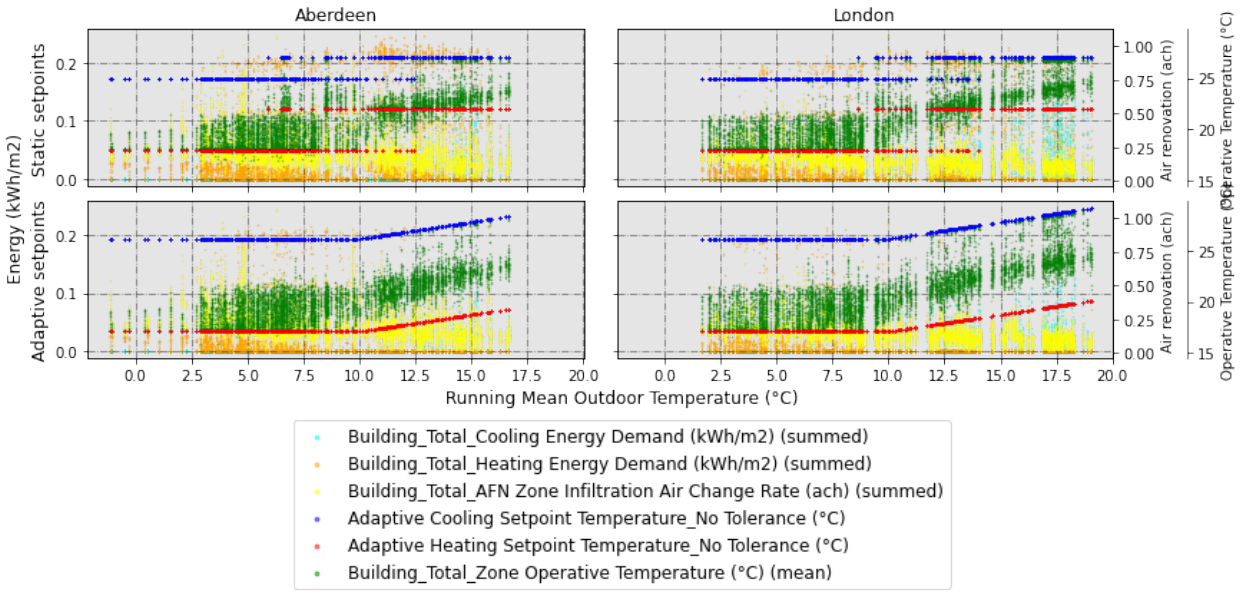
```
    figsize=6,
    ratio_height_to_width=0.33,
    confirm_graph=True
)
```

```
The number of rows and the list of these is going to be:
No. of rows = 2
List of rows:
CM_0[CA_3
CM_3[CA_3
Do you want to rename the rows? [y/n]: y
Please enter the new name for CM_0[CA_3: Static setpoints
Please enter the new name for CM_3[CA_3: Adaptive setpoints
The renamed rows are going to be:
Static setpoints
Adaptive setpoints
The number of columns and the list of these is going to be:
No. of columns = 2
List of columns:
Aberdeen
London
Column names will be the subplot titles. Do you want to rename them? [y/n]: n
```



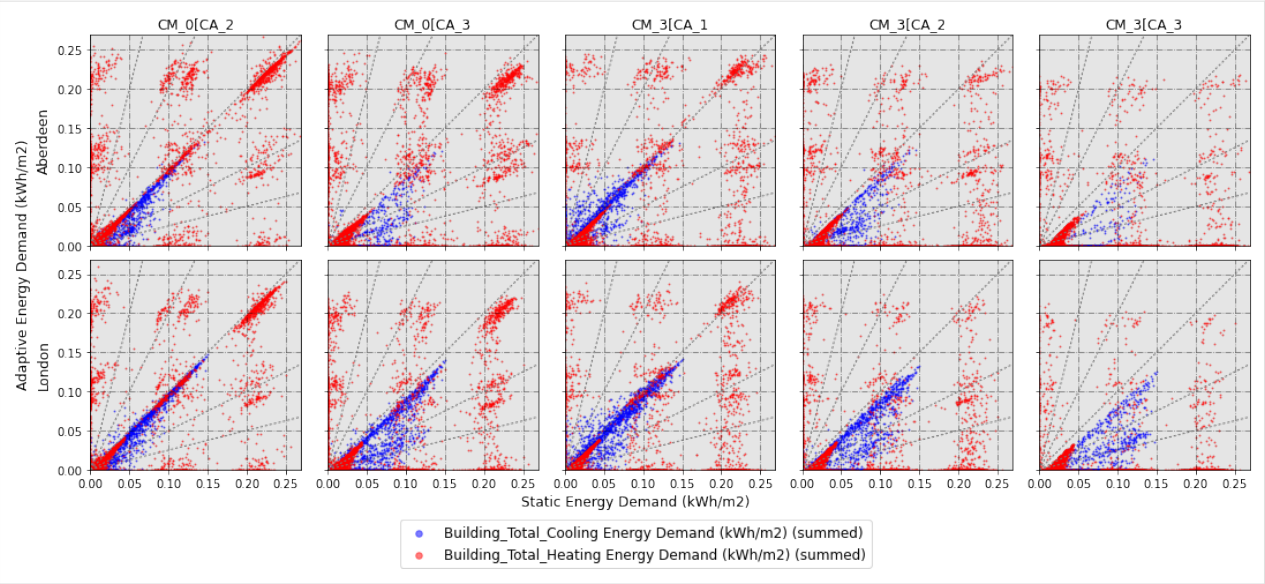
12.3.2 3.2 Adaptive vs Static data scatter plot:

A very specific type of scatter plot can be done to show the relationship between data related to adaptive and static setpoint temperatures. In this case, you would need to use the following arguments in generate_fig_data: adap_vs_stat_data_y_main, baseline and colorlist_adap_vs_stat_data; finally, you would need to use the scatter_plot_adap_vs_stat() function.

[17]:
```
dataset_hourly.scatter_plot_with_baseline(
    vars_to_gather_rows=['EPW_City_or_subcountry'], #you can enter multiple variables, for example: ['EPW_City_or_subcountry', 'EPW_Scenario-Year']
    vars_to_gather_cols=['ComfMod', 'CAT'], #you can enter multiple variables
    data_on_y_axis_baseline_plot=[ # in this case, you only need to specify a list which includes the data columns you want to plot
        'Building_Total_Cooling Energy Demand (kWh/m2) (summed)',
        'Building_Total_Heating Energy Demand (kWh/m2) (summed)',
    ],
    baseline='CM_0[CA_1', # the baseline needs to be in vars_to_gather_cols, and it's going to be shown on x axis. Given the variables we have simulated, you can choose between 'CM_0[CA_1', 'CM_0[CA_2', 'CM_0[CA_3', 'CM_3[CA_1', 'CM_3[CA_2' and 'CM_3[CA_3'
    colorlist_baseline_plot_data=[
        'b',
        'r',
    ],

    supxlabel='Static Energy Demand (kWh/m2)',
    supylabel='Adaptive Energy Demand (kWh/m2)',
    figname='WIP_scatterplot_adap_vs_stat',
    figsize=3,
    confirm_graph=True
)
```

```
The number of rows and the list of these is going to be:
No. of rows = 2
List of rows:
Aberdeen
London
Do you want to rename the rows? [y/n]: n
The number of columns and the list of these is going to be:
No. of columns = 5
List of columns:
CM_0[CA_2
CM_0[CA_3
CM_3[CA_1
CM_3[CA_2
CM_3[CA_3
Column names will be the subplot titles. Do you want to rename them? [y/n]: n
```



Now, let's delete all the images we have created to save some space:

[18]:
```
for i in os.listdir():
    if i.endswith('.png'):
        os.remove(i)
```

12.4 4. Making tables

Now, let's make some tables comparing results. For example, let's make a table to show monthly values of heating and cooling energy demand. First, let's generate the dataset with monthly frequency and let's filter the columns to keep heating and cooling demand at building level.

[19]:
```
from accim.data.data_postprocessing import Table
dataset_monthly = Table(
    #datasets=list Since we are not specifying any list, it will use all available CSVs␣
↪in the folder
    source_frequency='hourly',
    frequency='monthly',
    frequency_agg_func='sum', #this makes the sum or average when aggregating in days,␣
↪months or runperiod; since the original CSV frequency is in hour, it won't make any␣
↪aeffect
    standard_outputs=True,
    level=['building'],
    level_agg_func=['sum'],
    level_excluded_zones=[],
    split_epw_names=True, #to split EPW names based on the format Country_City_
↪RCPscenario-YEar
)

dataset_monthly.format_table(
    type_of_table='custom',
    custom_cols=[
```

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```
        'Building_Total_Cooling Energy Demand (kWh/m2) (summed)',
        'Building_Total_Heating Energy Demand (kWh/m2) (summed)',
    ]
)
```

```
No zones have been excluded from level computations.
All CSVs are for present scenario.
```

Now, let's make the table we are looking for. You can choose 'unstack' or 'pivot' as a reshaping method (remember that we are actually working with Pandas Dataframes). Let's go with unstack, and we are going to compare the baseline shown below with all gathered variables

[20]:
```
dataset_monthly.wrangled_table(
    reshaping='unstack', #can be 'unstack' or 'pivot'
    vars_to_gather=['ComfMod', 'CAT'],
    vars_to_keep=['EPW_City_or_subcountry'],
    baseline='CM_0[CA_1',
    comparison_mode=['baseline compared to others'], #can be 'baseline compared to others
↪' or 'others compared to baseline'
    comparison_cols=['relative', 'absolute'] #'relative' to show the difference as a␣
↪percentage, 'absolute' to show the difference by subtracting
)
```

[21]:
```
dataset_monthly.wrangled_df_unstacked
```

[21]:
```
                                          Building_Total_Cooling Energy Demand (kWh/
↪m2) (summed)  \
                                                                                    ␣
↪  CM_0[CA_1
Date/time        Month EPW_City_or_subcountry
 01/01  01:00:00 01    Aberdeen                                                     ␣
↪    0.00
                       London                                                       ␣
↪    0.12
 02/01  01:00:00 02    Aberdeen                                                     ␣
↪    0.29
                       London                                                       ␣
↪    0.43
 03/01  01:00:00 03    Aberdeen                                                     ␣
↪    1.39
                       London                                                       ␣
↪    1.34
 04/01  01:00:00 04    Aberdeen                                                     ␣
↪    3.38
                       London                                                       ␣
↪    6.95
 05/01  01:00:00 05    Aberdeen                                                     ␣
↪    8.78
                       London                                                       ␣
↪   14.37
 06/01  01:00:00 06    Aberdeen                                                     ␣
↪   12.16
                       London                                                       ␣
```

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```
↪  16.10
 07/01  01:00:00 07    Aberdeen                                                 ␣
↪  12.15
                       London                                                   ␣
↪  25.21
 08/01  01:00:00 08    Aberdeen                                                 ␣
↪  11.45
                       London                                                   ␣
↪  22.48
 09/01  01:00:00 09    Aberdeen                                                 ␣
↪   3.24
                       London                                                   ␣
↪  10.22
 10/01  01:00:00 10    Aberdeen                                                 ␣
↪   0.27
                       London                                                   ␣
↪   3.85
 11/01  01:00:00 11    Aberdeen                                                 ␣
↪   0.05
                       London                                                   ␣
↪   0.40
 12/01  01:00:00 12    Aberdeen                                                 ␣
↪   0.00
                       London                                                   ␣
↪   0.00

                                                                                \
                                                  CM_3[CA_1 CM_0[CA_2 CM_3[CA_2
Date/time        Month EPW_City_or_subcountry
 01/01  01:00:00 01    Aberdeen                       0.00      0.00      0.00
                       London                         0.00      0.04      0.00
 02/01  01:00:00 02    Aberdeen                       0.26      0.14      0.00
                       London                         0.09      0.07      0.00
 03/01  01:00:00 03    Aberdeen                       1.06      0.71      0.26
                       London                         0.95      0.82      0.06
 04/01  01:00:00 04    Aberdeen                       2.72      1.92      0.79
                       London                         6.75      5.65      2.76
 05/01  01:00:00 05    Aberdeen                       7.24      5.67      1.67
                       London                        14.89     11.25      8.51
 06/01  01:00:00 06    Aberdeen                      11.19      8.94      4.83
                       London                        16.39     14.03     10.63
 07/01  01:00:00 07    Aberdeen                      12.88      9.30      5.85
                       London                        18.93     22.81     10.30
 08/01  01:00:00 08    Aberdeen                      11.50      8.82      4.58
                       London                        16.96     19.97     10.88
 09/01  01:00:00 09    Aberdeen                       4.74      1.39      0.77
                       London                        10.32      8.71      5.35
 10/01  01:00:00 10    Aberdeen                       0.38      0.18      0.00
                       London                         4.53      3.66      1.18
 11/01  01:00:00 11    Aberdeen                       0.04      0.07      0.00
                       London                         0.05      0.10      0.00
 12/01  01:00:00 12    Aberdeen                       0.00      0.00      0.00
```

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```
                      London                          0.00      0.00      0.00

                                                                              \
                                                  CM_0[CA_3 CM_3[CA_3
Date/time        Month EPW_City_or_subcountry
 01/01  01:00:00 01    Aberdeen                       0.00      0.00
                       London                         0.00      0.00
 02/01  01:00:00 02    Aberdeen                       0.00      0.00
                       London                         0.00      0.00
 03/01  01:00:00 03    Aberdeen                       0.26      0.06
                       London                         0.00      0.00
 04/01  01:00:00 04    Aberdeen                       0.32      0.00
                       London                         2.66      0.72
 05/01  01:00:00 05    Aberdeen                       1.42      0.09
                       London                         4.88      3.60
 06/01  01:00:00 06    Aberdeen                       2.89      1.35
                       London                         9.05      5.27
 07/01  01:00:00 07    Aberdeen                       4.02      1.65
                       London                        15.55      4.38
 08/01  01:00:00 08    Aberdeen                       4.13      2.37
                       London                        13.45      5.21
 09/01  01:00:00 09    Aberdeen                       0.29      0.17
                       London                         4.03      1.56
 10/01  01:00:00 10    Aberdeen                       0.24      0.00
                       London                         3.32      0.35
 11/01  01:00:00 11    Aberdeen                       0.00      0.00
                       London                         0.00      0.00
 12/01  01:00:00 12    Aberdeen                       0.00      0.00
                       London                         0.00      0.00

                                                                                  \
                                                  1-(CM_0[CA_1/CM_3[CA_1)
Date/time        Month EPW_City_or_subcountry
 01/01  01:00:00 01    Aberdeen                            NaN
                       London                             -inf
 02/01  01:00:00 02    Aberdeen                         -0.14
                       London                           -3.98
 03/01  01:00:00 03    Aberdeen                         -0.32
                       London                           -0.41
 04/01  01:00:00 04    Aberdeen                         -0.24
                       London                           -0.03
 05/01  01:00:00 05    Aberdeen                         -0.21
                       London                            0.03
 06/01  01:00:00 06    Aberdeen                         -0.09
                       London                            0.02
 07/01  01:00:00 07    Aberdeen                          0.06
                       London                           -0.33
 08/01  01:00:00 08    Aberdeen                          0.00
                       London                           -0.33
 09/01  01:00:00 09    Aberdeen                          0.32
                       London                            0.01
 10/01  01:00:00 10    Aberdeen                          0.29
```

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```
                       London                                        0.15
 11/01  01:00:00 11    Aberdeen                                     -0.11
                       London                                       -7.45
 12/01  01:00:00 12    Aberdeen                                       NaN
                       London                                         NaN

                                                                        \
                                                  CM_3[CA_1 - CM_0[CA_1
Date/time        Month EPW_City_or_subcountry
 01/01  01:00:00 01    Aberdeen                                      0.00
                       London                                       -0.12
 02/01  01:00:00 02    Aberdeen                                     -0.04
                       London                                       -0.34
 03/01  01:00:00 03    Aberdeen                                     -0.33
                       London                                       -0.39
 04/01  01:00:00 04    Aberdeen                                     -0.66
                       London                                       -0.20
 05/01  01:00:00 05    Aberdeen                                     -1.54
                       London                                        0.52
 06/01  01:00:00 06    Aberdeen                                     -0.98
                       London                                        0.29
 07/01  01:00:00 07    Aberdeen                                      0.73
                       London                                       -6.28
 08/01  01:00:00 08    Aberdeen                                      0.04
                       London                                       -5.53
 09/01  01:00:00 09    Aberdeen                                      1.50
                       London                                        0.09
 10/01  01:00:00 10    Aberdeen                                      0.11
                       London                                        0.68
 11/01  01:00:00 11    Aberdeen                                     -0.00
                       London                                       -0.35
 12/01  01:00:00 12    Aberdeen                                      0.00
                       London                                        0.00

                                                                          \
                                                1-(CM_0[CA_1/CM_0[CA_2)
Date/time        Month EPW_City_or_subcountry
 01/01  01:00:00 01    Aberdeen                                       NaN
                       London                                       -2.14
 02/01  01:00:00 02    Aberdeen                                     -1.08
                       London                                       -5.36
 03/01  01:00:00 03    Aberdeen                                     -0.97
                       London                                       -0.64
 04/01  01:00:00 04    Aberdeen                                     -0.76
                       London                                       -0.23
 05/01  01:00:00 05    Aberdeen                                     -0.55
                       London                                       -0.28
 06/01  01:00:00 06    Aberdeen                                     -0.36
                       London                                       -0.15
 07/01  01:00:00 07    Aberdeen                                     -0.31
                       London                                       -0.11
 08/01  01:00:00 08    Aberdeen                                     -0.30
```

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```
                        London                                    -0.13
 09/01  01:00:00 09     Aberdeen                                  -1.34
                        London                                    -0.17
 10/01  01:00:00 10     Aberdeen                                  -0.55
                        London                                    -0.05
 11/01  01:00:00 11     Aberdeen                                   0.28
                        London                                    -2.81
 12/01  01:00:00 12     Aberdeen                                    NaN
                        London                                      NaN

                                                                    ...  \
                                                CM_0[CA_2 - CM_0[CA_1  ...
Date/time        Month EPW_City_or_subcountry                        ...
 01/01  01:00:00 01     Aberdeen                                  0.00  ...
                        London                                   -0.08  ...
 02/01  01:00:00 02     Aberdeen                                 -0.15  ...
                        London                                   -0.36  ...
 03/01  01:00:00 03     Aberdeen                                 -0.69  ...
                        London                                   -0.52  ...
 04/01  01:00:00 04     Aberdeen                                 -1.45  ...
                        London                                   -1.30  ...
 05/01  01:00:00 05     Aberdeen                                 -3.11  ...
                        London                                   -3.12  ...
 06/01  01:00:00 06     Aberdeen                                 -3.22  ...
                        London                                   -2.07  ...
 07/01  01:00:00 07     Aberdeen                                 -2.85  ...
                        London                                   -2.41  ...
 08/01  01:00:00 08     Aberdeen                                 -2.63  ...
                        London                                   -2.51  ...
 09/01  01:00:00 09     Aberdeen                                 -1.86  ...
                        London                                   -1.52  ...
 10/01  01:00:00 10     Aberdeen                                 -0.10  ...
                        London                                   -0.19  ...
 11/01  01:00:00 11     Aberdeen                                  0.02  ...
                        London                                   -0.29  ...
 12/01  01:00:00 12     Aberdeen                                  0.00  ...
                        London                                    0.00  ...

                                                Building_Total_Heating Energy Demand (kWh/
↪m2) (summed)  \
                                                                                    1-(CM_0[CA_
↪1/CM_3[CA_1)
Date/time        Month EPW_City_or_subcountry
 01/01  01:00:00 01     Aberdeen                                                            ␣
↪   -0.26
                        London                                                              ␣
↪   -0.08
 02/01  01:00:00 02     Aberdeen                                                            ␣
↪   -0.12
                        London                                                              ␣
↪    0.01
 03/01  01:00:00 03     Aberdeen                                                            ␣
```

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```
↪  -0.02
                      London                                                  ␣
↪   0.05
 04/01  01:00:00 04   Aberdeen                                                ␣
↪   0.04
                      London                                                  ␣
↪  -0.09
 05/01  01:00:00 05   Aberdeen                                                ␣
↪  -0.36
                      London                                                  ␣
↪  -1.84
 06/01  01:00:00 06   Aberdeen                                                ␣
↪  -0.95
                      London                                                  ␣
↪  -2.43
 07/01  01:00:00 07   Aberdeen                                                ␣
↪  -2.70
                      London                                                  ␣
↪  -0.31
 08/01  01:00:00 08   Aberdeen                                                ␣
↪  -2.32
                      London                                                  ␣
↪  -0.73
 09/01  01:00:00 09   Aberdeen                                                ␣
↪  -2.74
                      London                                                  ␣
↪  -2.71
 10/01  01:00:00 10   Aberdeen                                                ␣
↪  -0.27
                      London                                                  ␣
↪  -0.77
 11/01  01:00:00 11   Aberdeen                                                ␣
↪  -0.05
                      London                                                  ␣
↪  -0.01
 12/01  01:00:00 12   Aberdeen                                                ␣
↪  -0.23
                      London                                                  ␣
↪  -0.10

                                                                             \
                                                 CM_3[CA_1 - CM_0[CA_1
Date/time        Month EPW_City_or_subcountry
 01/01  01:00:00 01   Aberdeen                                      -3.05
                      London                                        -1.35
 02/01  01:00:00 02   Aberdeen                                      -2.05
                      London                                         0.17
 03/01  01:00:00 03   Aberdeen                                      -0.41
                      London                                         1.29
 04/01  01:00:00 04   Aberdeen                                       1.18
                      London                                        -1.91
 05/01  01:00:00 05   Aberdeen                                      -9.43
```

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```
                      London                                    -28.72
 06/01  01:00:00 06   Aberdeen                                  -20.62
                      London                                    -30.47
 07/01  01:00:00 07   Aberdeen                                  -36.28
                      London                                     -2.70
 08/01  01:00:00 08   Aberdeen                                  -31.05
                      London                                     -6.28
 09/01  01:00:00 09   Aberdeen                                  -40.09
                      London                                    -31.33
 10/01  01:00:00 10   Aberdeen                                   -6.41
                      London                                    -11.56
 11/01  01:00:00 11   Aberdeen                                   -0.82
                      London                                     -0.15
 12/01  01:00:00 12   Aberdeen                                   -2.81
                      London                                     -1.46

                                                                      \
                                              1-(CM_0[CA_1/CM_0[CA_2)
Date/time        Month EPW_City_or_subcountry
 01/01  01:00:00 01   Aberdeen                                    -0.16
                      London                                      -0.12
 02/01  01:00:00 02   Aberdeen                                    -0.09
                      London                                      -0.04
 03/01  01:00:00 03   Aberdeen                                    -0.03
                      London                                      -0.08
 04/01  01:00:00 04   Aberdeen                                     0.02
                      London                                      -0.10
 05/01  01:00:00 05   Aberdeen                                     0.15
                      London                                       0.15
 06/01  01:00:00 06   Aberdeen                                     0.08
                      London                                       0.04
 07/01  01:00:00 07   Aberdeen                                     0.12
                      London                                       0.22
 08/01  01:00:00 08   Aberdeen                                     0.12
                      London                                       0.17
 09/01  01:00:00 09   Aberdeen                                     0.09
                      London                                      -0.03
 10/01  01:00:00 10   Aberdeen                                    -0.25
                      London                                      -0.42
 11/01  01:00:00 11   Aberdeen                                    -0.16
                      London                                      -0.08
 12/01  01:00:00 12   Aberdeen                                    -0.17
                      London                                      -0.20

                                                                     \
                                             CM_0[CA_2 - CM_0[CA_1
Date/time        Month EPW_City_or_subcountry
 01/01  01:00:00 01   Aberdeen                                    -2.11
                      London                                      -1.96
 02/01  01:00:00 02   Aberdeen                                    -1.52
                      London                                      -0.78
 03/01  01:00:00 03   Aberdeen                                    -0.72
```

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```
                      London                                    -1.80
 04/01  01:00:00 04   Aberdeen                                   0.62
                      London                                    -1.95
 05/01  01:00:00 05   Aberdeen                                   6.35
                      London                                     7.73
 06/01  01:00:00 06   Aberdeen                                   3.45
                      London                                     1.86
 07/01  01:00:00 07   Aberdeen                                   6.50
                      London                                     3.16
 08/01  01:00:00 08   Aberdeen                                   5.91
                      London                                     3.10
 09/01  01:00:00 09   Aberdeen                                   5.11
                      London                                    -1.20
 10/01  01:00:00 10   Aberdeen                                  -5.88
                      London                                    -7.85
 11/01  01:00:00 11   Aberdeen                                  -2.45
                      London                                    -1.62
 12/01  01:00:00 12   Aberdeen                                  -2.26
                      London                                    -2.79

                                                                      \
                                                 1-(CM_0[CA_1/CM_3[CA_2)
Date/time        Month EPW_City_or_subcountry
 01/01  01:00:00 01   Aberdeen                                    -0.67
                      London                                      -0.54
 02/01  01:00:00 02   Aberdeen                                    -0.37
                      London                                      -0.39
 03/01  01:00:00 03   Aberdeen                                    -0.23
                      London                                      -0.27
 04/01  01:00:00 04   Aberdeen                                    -0.12
                      London                                      -0.47
 05/01  01:00:00 05   Aberdeen                                    -0.69
                      London                                      -4.41
 06/01  01:00:00 06   Aberdeen                                    -1.32
                      London                                      -7.01
 07/01  01:00:00 07   Aberdeen                                    -9.81
                      London                                      -3.47
 08/01  01:00:00 08   Aberdeen                                    -7.08
                      London                                      -5.00
 09/01  01:00:00 09   Aberdeen                                    -4.90
                      London                                      -8.28
 10/01  01:00:00 10   Aberdeen                                    -0.96
                      London                                      -2.65
 11/01  01:00:00 11   Aberdeen                                    -0.55
                      London                                      -0.61
 12/01  01:00:00 12   Aberdeen                                    -0.69
                      London                                      -0.75

                                                                     \
                                                 CM_3[CA_2 - CM_0[CA_1
Date/time        Month EPW_City_or_subcountry
 01/01  01:00:00 01   Aberdeen                                    -6.02
```

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```
                        London                                    -6.20
 02/01  01:00:00 02     Aberdeen                                  -5.24
                        London                                    -5.15
 03/01  01:00:00 03     Aberdeen                                  -4.67
                        London                                    -5.44
 04/01  01:00:00 04     Aberdeen                                  -2.87
                        London                                    -7.04
 05/01  01:00:00 05     Aberdeen                                 -14.40
                        London                                   -36.14
 06/01  01:00:00 06     Aberdeen                                 -24.09
                        London                                   -37.66
 07/01  01:00:00 07     Aberdeen                                 -45.11
                        London                                    -8.85
 08/01  01:00:00 08     Aberdeen                                 -38.92
                        London                                   -12.40
 09/01  01:00:00 09     Aberdeen                                 -45.43
                        London                                   -38.27
 10/01  01:00:00 10     Aberdeen                                 -14.61
                        London                                   -19.23
 11/01  01:00:00 11     Aberdeen                                  -6.37
                        London                                    -8.43
 12/01  01:00:00 12     Aberdeen                                  -6.27
                        London                                    -7.03

                                                                       \
                                                 1-(CM_0[CA_1/CM_0[CA_3)
Date/time        Month EPW_City_or_subcountry
 01/01  01:00:00 01     Aberdeen                                   -0.65
                        London                                     -0.58
 02/01  01:00:00 02     Aberdeen                                   -0.39
                        London                                     -0.44
 03/01  01:00:00 03     Aberdeen                                   -0.26
                        London                                     -0.26
 04/01  01:00:00 04     Aberdeen                                   -0.12
                        London                                     -0.55
 05/01  01:00:00 05     Aberdeen                                    0.19
                        London                                      0.08
 06/01  01:00:00 06     Aberdeen                                   -0.00
                        London                                     -0.29
 07/01  01:00:00 07     Aberdeen                                   -0.08
                        London                                      0.23
 08/01  01:00:00 08     Aberdeen                                   -0.10
                        London                                     -0.06
 09/01  01:00:00 09     Aberdeen                                   -0.18
                        London                                     -0.36
 10/01  01:00:00 10     Aberdeen                                   -1.16
                        London                                     -4.72
 11/01  01:00:00 11     Aberdeen                                   -0.57
                        London                                     -0.61
 12/01  01:00:00 12     Aberdeen                                   -0.75
                        London                                     -0.71
```

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```
                                                                    \
                                                CM_0[CA_3 - CM_0[CA_1
Date/time        Month EPW_City_or_subcountry
 01/01  01:00:00 01    Aberdeen                                -5.90
                       London                                  -6.50
 02/01  01:00:00 02    Aberdeen                                -5.43
                       London                                  -5.59
 03/01  01:00:00 03    Aberdeen                                -5.14
                       London                                  -5.28
 04/01  01:00:00 04    Aberdeen                                -2.72
                       London                                  -7.87
 05/01  01:00:00 05    Aberdeen                                 8.35
                       London                                   3.91
 06/01  01:00:00 06    Aberdeen                                -0.14
                       London                                  -9.79
 07/01  01:00:00 07    Aberdeen                                -3.64
                       London                                   3.32
 08/01  01:00:00 08    Aberdeen                                -3.91
                       London                                  -0.83
 09/01  01:00:00 09    Aberdeen                                -8.19
                       London                                 -11.29
 10/01  01:00:00 10    Aberdeen                               -15.99
                       London                                 -21.86
 11/01  01:00:00 11    Aberdeen                                -6.53
                       London                                  -8.42
 12/01  01:00:00 12    Aberdeen                                -6.55
                       London                                  -6.86

                                                                     \
                                                1-(CM_0[CA_1/CM_3[CA_3)
Date/time        Month EPW_City_or_subcountry
 01/01  01:00:00 01    Aberdeen                                 -1.11
                       London                                   -1.16
 02/01  01:00:00 02    Aberdeen                                 -1.01
                       London                                   -1.21
 03/01  01:00:00 03    Aberdeen                                 -0.80
                       London                                   -1.04
 04/01  01:00:00 04    Aberdeen                                 -0.56
                       London                                   -1.79
 05/01  01:00:00 05    Aberdeen                                 -2.12
                       London                                  -16.23
 06/01  01:00:00 06    Aberdeen                                 -4.55
                       London                                  -33.04
 07/01  01:00:00 07    Aberdeen                               -245.24
                       London                                  -51.57
 08/01  01:00:00 08    Aberdeen                                -40.97
                       London                                  -46.92
 09/01  01:00:00 09    Aberdeen                                -12.52
                       London                                  -38.49
 10/01  01:00:00 10    Aberdeen                                 -2.84
                       London                                  -12.53
 11/01  01:00:00 11    Aberdeen                                 -1.48
```

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```
                        London                                    -2.35
 12/01  01:00:00 12     Aberdeen                                  -1.51
                        London                                    -1.75


                                                  CM_3[CA_3 - CM_0[CA_1
Date/time         Month EPW_City_or_subcountry
 01/01  01:00:00 01     Aberdeen                                   -7.88
                        London                                     -9.53
 02/01  01:00:00 02     Aberdeen                                   -9.65
                        London                                    -10.06
 03/01  01:00:00 03     Aberdeen                                  -11.02
                        London                                    -12.95
 04/01  01:00:00 04     Aberdeen                                   -9.36
                        London                                    -14.23
 05/01  01:00:00 05     Aberdeen                                  -24.07
                        London                                    -41.76
 06/01  01:00:00 06     Aberdeen                                  -34.76
                        London                                    -41.77
 07/01  01:00:00 07     Aberdeen                                  -49.51
                        London                                    -11.18
 08/01  01:00:00 08     Aberdeen                                  -43.37
                        London                                    -14.57
 09/01  01:00:00 09     Aberdeen                                  -50.66
                        London                                    -41.80
 10/01  01:00:00 10     Aberdeen                                  -22.01
                        London                                    -24.53
 11/01  01:00:00 11     Aberdeen                                  -10.69
                        London                                    -15.54
 12/01  01:00:00 12     Aberdeen                                   -9.19
                        London                                    -10.48

[24 rows x 32 columns]
```

Let's make a different dataset to work with runperiod frequency.

[22]:
```
from accim.data.data_postprocessing import Table
dataset_runperiod = Table(
    #datasets=list Since we are not specifying any list, it will use all available CSVs␣
↪in the folder
    source_frequency='hourly',
    frequency='runperiod',
    frequency_agg_func='sum', #this makes the sum or average when aggregating in days,␣
↪months or runperiod; since the original CSV frequency is in hour, it won't make any␣
↪aeffect
    standard_outputs=True,
    level=['building'],
    level_agg_func=['sum'],
    level_excluded_zones=[],
    #match_cities=bool Only used when EPW file has NOT been previously renamed
    #manage_epw_names=bool Only used when EPW file has NOT been previously renamed
    split_epw_names=True, #to split EPW names based on the format Country_City_
```

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```
↪RCPscenario-YEar
)

dataset_runperiod.format_table(
    type_of_table='custom',
    custom_cols=[
        'Building_Total_Cooling Energy Demand (kWh/m2) (summed)',
        'Building_Total_Heating Energy Demand (kWh/m2) (summed)',
    ]
)
```

```
No zones have been excluded from level computations.
All CSVs are for present scenario.
```

In this case, we are going to use the 'pivot' reshaping option:

[23]:
```
dataset_runperiod.wrangled_table(
    reshaping='pivot',
    vars_to_gather=['ComfMod', 'CAT'],
    baseline='CM_0[CA_1',
    comparison_mode=['baseline compared to others'],
    comparison_cols=['relative', 'absolute']
)
```

```
C:\users\sanga\appdata\local\programs\python\python39\lib\site-packages\accim\data\data_
↪postprocessing.py:1622: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_
↪guide/indexing.html#returning-a-view-versus-a-copy
  self.df['col_to_pivot'] = 'temp'
C:\users\sanga\appdata\local\programs\python\python39\lib\site-packages\accim\data\data_
↪postprocessing.py:1635: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_
↪guide/indexing.html#returning-a-view-versus-a-copy
  self.df['col_to_pivot'] = wrangled_df_pivoted['col_to_pivot']
```

[24]:
```
dataset_runperiod.wrangled_df_pivoted
```

[24]:
```
col_to_pivot                                        CM_0[CA_1  CM_0[CA_2  \
Building_Total_Cooling Energy Demand (kWh/m2) (...     154.66     124.24
Building_Total_Heating Energy Demand (kWh/m2) (...     680.07     688.99

col_to_pivot                                        CM_0[CA_3  CM_3[CA_1  \
Building_Total_Cooling Energy Demand (kWh/m2) (...      66.51     141.86
Building_Total_Heating Energy Demand (kWh/m2) (...     547.22     413.73

col_to_pivot                                        CM_3[CA_2  CM_3[CA_3  \
```

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```
Building_Total_Cooling Energy Demand (kWh/m2) (...      68.41      26.77
Building_Total_Heating Energy Demand (kWh/m2) (...     274.22     149.52

col_to_pivot                                        1-(CM_0[CA_1/CM_3[CA_2)  \
Building_Total_Cooling Energy Demand (kWh/m2) (...                    -1.26
Building_Total_Heating Energy Demand (kWh/m2) (...                    -1.48

col_to_pivot                                        CM_3[CA_2 - CM_0[CA_1  \
Building_Total_Cooling Energy Demand (kWh/m2) (...                  -86.24
Building_Total_Heating Energy Demand (kWh/m2) (...                 -405.85

col_to_pivot                                        1-(CM_0[CA_1/CM_0[CA_3)  \
Building_Total_Cooling Energy Demand (kWh/m2) (...                    -1.33
Building_Total_Heating Energy Demand (kWh/m2) (...                    -0.24

col_to_pivot                                        CM_0[CA_3 - CM_0[CA_1  \
Building_Total_Cooling Energy Demand (kWh/m2) (...                  -88.14
Building_Total_Heating Energy Demand (kWh/m2) (...                 -132.84

col_to_pivot                                        1-(CM_0[CA_1/CM_3[CA_1)  \
Building_Total_Cooling Energy Demand (kWh/m2) (...                    -0.09
Building_Total_Heating Energy Demand (kWh/m2) (...                    -0.64

col_to_pivot                                        CM_3[CA_1 - CM_0[CA_1  \
Building_Total_Cooling Energy Demand (kWh/m2) (...                  -12.80
Building_Total_Heating Energy Demand (kWh/m2) (...                 -266.33

col_to_pivot                                        1-(CM_0[CA_1/CM_0[CA_2)  \
Building_Total_Cooling Energy Demand (kWh/m2) (...                    -0.24
Building_Total_Heating Energy Demand (kWh/m2) (...                     0.01

col_to_pivot                                        CM_0[CA_2 - CM_0[CA_1  \
Building_Total_Cooling Energy Demand (kWh/m2) (...                  -30.42
Building_Total_Heating Energy Demand (kWh/m2) (...                    8.92

col_to_pivot                                        1-(CM_0[CA_1/CM_3[CA_3)  \
Building_Total_Cooling Energy Demand (kWh/m2) (...                    -4.78
Building_Total_Heating Energy Demand (kWh/m2) (...                    -3.55

col_to_pivot                                        CM_3[CA_3 - CM_0[CA_1
Building_Total_Cooling Energy Demand (kWh/m2) (...                 -127.89
Building_Total_Heating Energy Demand (kWh/m2) (...                 -530.55
```

Again, please remember we are working with Pandas Dataframe objects. That means we can modify the df we have generated. For instance, we can simplify it by removing all rows except those with 'CA_3' in the Category column, as shown below.

[25]:
```
dataset_runperiod.df = dataset_runperiod.df[
    dataset_runperiod.df['CAT'].isin(['CA_3'])
]
```

[26]:
```
dataset_runperiod.df
```

[26]:
```
        Model       ComfStand   CAT ComfMod HVACmode VentCtrl VSToffset  \
8   TestModel  CS_INT EN16798  CA_3    CM_0     HM_2     VC_0      VO_0
9   TestModel  CS_INT EN16798  CA_3    CM_0     HM_2     VC_0      VO_0
10  TestModel  CS_INT EN16798  CA_3    CM_3     HM_2     VC_0      VO_0
11  TestModel  CS_INT EN16798  CA_3    CM_3     HM_2     VC_0      VO_0

   MinOToffset MaxWindSpeed  ASTtol NameSuffix  \
8        MT_50        MW_50  AT_0.1       NS_X
9        MT_50        MW_50  AT_0.1       NS_X
10       MT_50        MW_50  AT_0.1       NS_X
11       MT_50        MW_50  AT_0.1       NS_X

                              EPW  \
8   United-Kingdom_Aberdeen_Present
9     United-Kingdom_London_Present
10  United-Kingdom_Aberdeen_Present
11    United-Kingdom_London_Present

                                          Source EPW_Country_name  \
8   TestModel[CS_INT EN16798[CA_3[CM_0[HM_2[VC_0[V...   United-Kingdom
9   TestModel[CS_INT EN16798[CA_3[CM_0[HM_2[VC_0[V...   United-Kingdom
10  TestModel[CS_INT EN16798[CA_3[CM_3[HM_2[VC_0[V...   United-Kingdom
11  TestModel[CS_INT EN16798[CA_3[CM_3[HM_2[VC_0[V...   United-Kingdom

   EPW_City_or_subcountry EPW_Scenario-Year EPW_Scenario EPW_Year  \
8                Aberdeen           Present      Present  Present
9                  London           Present      Present  Present
10               Aberdeen           Present      Present  Present
11                 London           Present      Present  Present

    Building_Total_Cooling Energy Demand (kWh/m2) (summed)  \
8                                          13.574438
9                                          52.938830
10                                          5.687532
11                                         21.084511

    Building_Total_Heating Energy Demand (kWh/m2) (summed)
8                                         318.977783
9                                         228.246073
10                                         92.602457
11                                         56.917599
```

And now we could make a similar pivoted table as above, but simplified to show only CA_3:

[27]:
```
dataset_runperiod.wrangled_table(
    reshaping='pivot',
    vars_to_gather=['ComfMod'],
    baseline='CM_0',
    comparison_mode=['baseline compared to others'],
    comparison_cols=['relative', 'absolute']
)
```

[28]:
```
dataset_runperiod.wrangled_df_pivoted
```

[28]:
```
col_to_pivot                                          CM_0    CM_3  \
Building_Total_Cooling Energy Demand (kWh/m2) (...   66.51   26.77
Building_Total_Heating Energy Demand (kWh/m2) (...  547.22  149.52

col_to_pivot                                        1-(CM_0/CM_3)  CM_3 - CM_0
Building_Total_Cooling Energy Demand (kWh/m2) (...          -1.48       -39.74
Building_Total_Heating Energy Demand (kWh/m2) (...          -2.66      -397.70
```

Another method to achieve this is generating a different Table object, only reading the CSV files with CA_3 in it name:

[29]:
```
import os
from accim.data.data_postprocessing import Table

dataset = [i for i in os.listdir() if i.endswith('.csv') and 'CA_3' in i]

dataset_runperiod_simplified_1 = Table(
    datasets=dataset,
    source_frequency='hourly',
    frequency='runperiod',
    frequency_agg_func='sum',
    # this makes the sum or average when aggregating in days, months or runperiod; since␣
↪the original CSV frequency is in hour, it won't make any aeffect
    standard_outputs=True,
    level=['building'],
    level_agg_func=['sum'],
    level_excluded_zones=[],
    split_epw_names=True,  # to split EPW names based on the format Country_City_
↪RCPscenario-YEar
)

dataset_runperiod_simplified_1.format_table(
    type_of_table='custom',
    custom_cols=[
        'Building_Total_Cooling Energy Demand (kWh/m2) (summed)',
        'Building_Total_Heating Energy Demand (kWh/m2) (summed)',
    ]
)

dataset_runperiod_simplified_1.wrangled_table(
    reshaping='pivot',
    vars_to_gather=['ComfMod'],
    baseline='CM_0',
    comparison_mode=['baseline compared to others'],
    comparison_cols=['relative', 'absolute']
)
```

```
No zones have been excluded from level computations.
All CSVs are for present scenario.
```

```
C:\users\sanga\appdata\local\programs\python\python39\lib\site-packages\accim\data\data_
↪postprocessing.py:1622: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_
↪guide/indexing.html#returning-a-view-versus-a-copy
  self.df['col_to_pivot'] = 'temp'
C:\users\sanga\appdata\local\programs\python\python39\lib\site-packages\accim\data\data_
↪postprocessing.py:1635: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_
↪guide/indexing.html#returning-a-view-versus-a-copy
  self.df['col_to_pivot'] = wrangled_df_pivoted['col_to_pivot']
```

You can see below the resulting table is exactly the same:

[30]:
```
dataset_runperiod_simplified_1.wrangled_df_pivoted
```

[30]:
```
col_to_pivot                                          CM_0    CM_3  \
Building_Total_Cooling Energy Demand (kWh/m2) (...   66.51   26.77
Building_Total_Heating Energy Demand (kWh/m2) (...  547.22  149.52

col_to_pivot                                        1-(CM_0/CM_3)  CM_3 - CM_0
Building_Total_Cooling Energy Demand (kWh/m2) (...          -1.48       -39.74
Building_Total_Heating Energy Demand (kWh/m2) (...          -2.66      -397.70
```

You can finally export the table as xlsx format:

[31]:
```
dataset_runperiod_simplified_1.wrangled_df_pivoted.to_excel('building_energy_demand.xlsx
↪')
```

Let's delete it now:

[32]:
```
for i in os.listdir():
    if i.endswith('.xlsx'):
        os.remove(i)
```

CHAPTER

THIRTEEN

ACCIM

13.1 accim package

13.1.1 Subpackages

13.1.1.1 accim.data package

13.1.1.1.1 Submodules

13.1.1.1.2 accim.data.data_postprocessing module

Classes and functions to perform data analytics after simulation runs.

class accim.data.data_postprocessing.**Table**(*datasets: Optional[list] = None*, *source_concatenated_csv_filepath: Optional[str] = None*, *source_frequency: Optional[str] = None*, *frequency: Optional[str] = None*, *frequency_agg_func: Optional[str] = None*, *standard_outputs: Optional[bool] = None*, *concatenated_csv_name: Optional[str] = None*, *level: Optional[list] = None*, *level_agg_func: Optional[list] = None*, *level_excluded_zones: Optional[list] = None*, *block_zone_hierarchy: Optional[dict] = None*, *split_epw_names: bool = False*, *normalised_energy_units: bool = True*, *rename_cols: bool = True*, *energy_units_in_kwh: bool = True*, *drop_nan: bool = False*, *name_export_rows_with_NaN: Optional[str] = None*, *name_export_rows_not_corr_agg: Optional[str] = None*)

Bases: object

Generates a table or dataframe using the EnergyPlus simulation results CSV files available in the current folder.

Parameters

- **datasets** (*list*) – A list of strings. The strings are the names of the CSV files that you want to work with, at the working directory.
- **source_concatenated_csv_filepath** (*str*) – A string used as the filepath to read the previously concatenated csv file with the argument concatenated_csv_name.
- **source_frequency** (*str*) – Used to inform accim about the frequency of the input CSVs. If there are multiple frequencies in a single CSV, the columns for the frequencies different to the selected one will be discarded. String can be 'timestep', 'hourly', 'daily', 'monthly' or 'runperiod'.

- **frequency** (*str*) – Rows will be aggregated based on this frequency. String can be 'timestep', 'hourly', 'daily', 'monthly' or 'runperiod'. For instance, if 'daily', hourly or timesteply rows will be aggregated in days. String can be 'timestep', 'hourly', 'daily', 'monthly' or 'runperiod'.
- **frequency_agg_func** (*str*) – Aggregates the rows based on the defined frequency by sum or mean. Can be 'sum' or 'mean'.
- **standard_outputs** (*bool*) – Used to consider only standard outputs from accim. It can be True or False.
- **concatenated_csv_name** (*str*) – Used as the name for the concatenated csv file.
- **drop_nan** (*bool*) – If True, drops the rows with NaNs before exporting the CSV using concatenated_csv_name.
- **level** (*list*) – A list of strings. Strings can be 'block' and/or 'building'. Used to create columns with block or building values.
- **level_agg_func** (*list*) – A list of strings. Strings can be 'sum' and/or 'mean'. Used to create the columns for levels preciously stated by summing and/or averaging.
- **level_excluded_zones** (*list*) – A list of strings. Strings must be the zones excluded from level computations. Used to try to match the cities in the EPW file name with actual cities. To be used if sample_EPWs have not been previously renamed with rename_epw_files().
- **split_epw_names** (*bool*) – It splits the EPW name into Country_City_RCPscenario-Year format. To be used if sample_EPWs do have been previously renamed with rename_epw_files().
- **normalised_energy_units** (*bool*) – A bool, can be True or False. Used to show Wh or Wh/m2 units.
- **rename_cols** (*bool*) – A bool, can be True or False. Used to keep the original name of EnergyPlus outputs or rename them for understanding purposes.
- **energy_units_in_kwh** (*bool*) – A bool, can be True or False. If True, energy units will be in kWh or kWh/m2, otherwise these will be in Wh or Wh/m2.
- **name_export_rows_with_NaN** (*str*) – This parameter shouldn't be generally used. A string used as a name to export a xlsx file with the rows with NaNs. Used only to check the rows with NANs.
- **name_export_rows_not_corr_agg** (*str*) – This parameter shouldn't be generally used. A string used as a name to export a xlsx file with the rows not correctly aggregated. Used only to check the aggregations are correct.

Variables

- **df** – The pandas DataFrame instance. It is modified when method `format_table` is called.
- **df_backup** – The full pandas DataFrame instance resulting from class `Table`. It is not modified, so can be used to revert the DataFrame instance to its initial state.
- **cols_for_multiindex** – The list of columns (or variables) that change in the dataset. These represent the variables that might be interesting to study, and therefore, the variables that are suggested to used in arguments `vars_to_gather`, `vars_to_gather_cols` or `vars_to_gather_rows`.
- **wrangled_df_unstacked** – The resulting pandas DataFrame after calling the method `wrangled_table` with `reshaping='unstack'`

- **wrangled_df_stacked** – The resulting pandas DataFrame after calling the method `wrangled_table` with `reshaping='stack'`
- **wrangled_df_multiindex** – The resulting pandas DataFrame after calling the method `wrangled_table` with `reshaping='multiindex'`
- **wrangled_df_pivoted** – The resulting pandas DataFrame after calling the method `wrangled_table` with `reshaping='pivot'`

custom_order(*ordered_list: Optional[list] = None*, *column_to_order: Optional[str] = None*)

Used to order the string values of a column in a custom order.

Parameters

- **ordered_list** (*list*) – A list os strings. Used to order the string values of a column in a custom order.
- **column_to_order** (*str*) – A string. It should be the column whose string values should be ordered.

enter_vars_to_gather(*vars_to_gather=None*)

Function used by accim to gather variables to be combined in columns.

Parameters

vars_to_gather (*list*) – The list of strings containing the variables.

format_table(*type_of_table: str = 'all'*, *custom_cols: Optional[list] = None*)

It filters the columns.

Parameters

- **type_of_table** – To get previously set out tables. Can be 'energy demand' or 'comfort hours'.
- **custom_cols** – A list of strings.

The strings will be used as a filter, and the columns that match will be selected.

gather_vars_query(*vars_to_gather: Optional[list] = None*)

Used to inform the user of the variables suitable to be analysed and the available options from a certain gathered variables

Parameters

vars_to_gather (*list*) – A list of variables.

generate_fig_data(*vars_to_gather_cols: Optional[list] = None*, *vars_to_gather_rows: Optional[list] = None*, *detailed_cols: Optional[list] = None*, *detailed_rows: Optional[list] = None*, *custom_cols_order: Optional[list] = None*, *custom_rows_order: Optional[list] = None*, *data_on_y_axis_baseline_plot: Optional[list] = None*, *baseline: Optional[str] = None*, *colorlist_baseline_plot_data: Optional[list] = None*, *data_on_x_axis: Optional[str] = None*, *data_on_y_main_axis: Optional[list] = None*, *data_on_y_sec_axis: Optional[list] = None*, *colorlist_y_main_axis: Optional[list] = None*, *colorlist_y_sec_axis: Optional[list] = None*, *best_fit_deg_y_main_axis: Optional[list] = None*, *best_fit_deg_y_sec_axis: Optional[list] = None*, *best_fit_deg: Optional[list] = None*, *rows_renaming_dict: Optional[dict] = None*, *cols_renaming_dict: Optional[dict] = None*)

Generates list of data to be plotted.

Parameters

- **vars_to_gather_cols** – A list of strings. The list should be the variables you want to show in subplot columns.

- **vars_to_gather_rows** – A list of strings. The list should be the variables you want to show in subplot rows.
- **detailed_cols** – A list of strings. The list should be the specific data you want to show in subplots columns. Used to filter.
- **detailed_rows** – A list of strings. The list should be the specific data you want to show in subplots rows. Used to filter.
- **custom_cols_order** – A list of strings. The list should be the specific order for the items shown in subplot columns.
- **custom_rows_order** – A list of strings. The list should be the specific order for the items shown in subplot rows.
- **data_on_y_axis_baseline_plot** – A list of strings. Used to select the data you want to show in the graph. Should be a list of the column names you want to plot in each subplot.
- **baseline** – A string, used only in data_on_y_axis_baseline_plot. The baseline should be one of the combinations in vars_to_gather_cols. It will be plotted in x-axis, while the reference combination for comparison in y-axis.
- **colorlist_baseline_plot_data** – A list of strings. Should be the colors using the matplotlib color notation for the columns entered in data_on_y_axis_baseline_plot in the same order.
- **data_on_x_axis** – A string. The column name you want to plot in the x-axis.
- **data_on_y_main_axis** – A list with nested lists and strings. Used to select the data you want to show in the scatter plot main y-axis. It needs to follow this structure: [['name_on_y_main_axis', [list of column names you want to plot]]
- **data_on_y_sec_axis** – A list with nested lists and strings. Used to select the data you want to show in the scatter plot secondary y-axis. It needs to follow this structure: [['name_on_1st_y_sec_axis', [list of column names you want to plot], ['name_on_2nd_y_sec_axis', [list of column names you want to plot], etc]
- **colorlist_y_main_axis** – A list with nested lists and strings. It should follow the same structure as data_on_y_main_axis, but replacing the column names with the colors using the matplotlib notation.
- **colorlist_y_sec_axis** – A list with nested lists and strings. It should follow the same structure as data_on_y_sec_axis, but replacing the column names with the colors using the matplotlib notation.
- **rows_renaming_dict** – A dictionary. Should follow the pattern {'old row name 1': 'new row name 1', 'old row name 2': 'new row name 2'}
- **cols_renaming_dict** – A dictionary. Should follow the pattern {'old col name 1': 'new col name 1', 'old col name 2': 'new col name 2'}

scatter_plot(*vars_to_gather_cols: Optional[list] = None*, *vars_to_gather_rows: Optional[list] = None*, *detailed_cols: Optional[list] = None*, *detailed_rows: Optional[list] = None*, *custom_cols_order: Optional[list] = None*, *custom_rows_order: Optional[list] = None*, *data_on_x_axis: Optional[str] = None*, *data_on_y_main_axis: Optional[list] = None*, *data_on_y_sec_axis: Optional[list] = None*, *colorlist_y_main_axis: Optional[list] = None*, *colorlist_y_sec_axis: Optional[list] = None*, *best_fit_deg_y_main_axis: Optional[list] = None*, *best_fit_deg_y_sec_axis: Optional[list] = None*, *rows_renaming_dict: Optional[dict] = None*, *cols_renaming_dict: Optional[dict] = None*, *sharex: bool = True*, *sharey: bool = True*, *supxlabel: Optional[str] = None*, *figname: Optional[str] = None*, *figsize: float = 1*, *ratio_height_to_width: float = 1*, *dpi: int = 500*, *confirm_graph: bool = False*, *set_facecolor: any = (0, 0, 0, 0.1)*, *best_fit_background_linewidth: float = 1*, *best_fit_linewidth: float = 0.5*, *best_fit_linestyle: any = (0, (5, 10))*)

Used to plot a scatter plot.

Parameters

- **vars_to_gather_cols** (*list*) – A list of strings. The list should be the variables you want to show in subplot columns.
- **vars_to_gather_rows** (*list*) – A list of strings. The list should be the variables you want to show in subplot rows.
- **detailed_cols** (*list*) – A list of strings. The list should be the specific data you want to show in subplots columns. Used to filter.
- **detailed_rows** (*list*) – A list of strings. The list should be the specific data you want to show in subplots rows. Used to filter.
- **custom_cols_order** (*list*) – A list of strings. The list should be the specific order for the items shown in subplot columns.
- **custom_rows_order** (*list*) – A list of strings. The list should be the specific order for the items shown in subplot rows.
- **data_on_x_axis** (*str*) – A string. The column name you want to plot in the x-axis.
- **data_on_y_main_axis** (*list*) – A list with nested lists and strings. Used to select the data you want to show in the scatter plot main y-axis. It needs to follow this structure: [['name_on_y_main_axis', [list of column names you want to plot]]]
- **data_on_y_sec_axis** (*list*) – A list with nested lists and strings. Used to select the data you want to show in the scatter plot secondary y-axis. It needs to follow this structure: [[['name_on_1st_y_sec_axis', [list of column names you want to plot]], ['name_on_2nd_y_sec_axis', [list of column names you want to plot]], etc]
- **colorlist_y_main_axis** (*list*) – A list with nested lists and strings. It should follow the same structure as data_on_y_main_axis, but replacing the column names with the colors using the matplotlib notation.
- **colorlist_y_sec_axis** (*list*) – A list with nested lists and strings. It should follow the same structure as data_on_y_sec_axis, but replacing the column names with the colors using the matplotlib notation.
- **best_fit_deg_y_sec_axis** (*list*) – A list with nested lists and strings. It should follow the same structure as data_on_y_sec_axis, but replacing the column names with the polynomial degree for the best fit lines.
- **best_fit_deg_y_main_axis** (*list*) – A list with nested lists and strings. It should follow the same structure as data_on_y_main_axis, but replacing the column names with the polynomial degree for the best fit lines.

- **rows_renaming_dict** (*dict*) – A dictionary. Should follow the pattern {'old row name 1': 'new row name 1', 'old row name 2': 'new row name 2'}
- **cols_renaming_dict** (*dict*) – A dictionary. Should follow the pattern {'old col name 1': 'new col name 1', 'old col name 2': 'new col name 2'}
- **sharey** (*bool*) – True to share the x-axis across all subplots
- **sharex** (*bool*) – True to share the y-axis across all subplots
- **supxlabel** (*str*) – A string. The label shown in the x-axis.
- **figname** (*str*) – A string. The name of the saved figure without extension.
- **figsize** (*float*) – A float. It is the figure size.
- **ratio_height_to_width** (*float*) – A float. By default, is 1 (squared). If 0.5 is entered, the figure will be half higher than wide.
- **dpi** (*int*) – An integer. The number of dpis for image quality.
- **confirm_graph** (*bool*) – A bool. True to skip confirmation step.
- **set_facecolor** (*any*) – Usage is similar to matplotlib.axes.Axes.set_facecolor
- **best_fit_linestyle** (*any*) – Anything in matplotlib linestyle notation. Use to change the style of the best fit lines.
- **best_fit_linewidth** (*float*) – A float. Used to change the width of the best fit lines.
- **best_fit_background_linewidth** (*float*) – A float. Used to change the width of the background best fit lines. Must be greater than best_fit_linewidth.

scatter_plot_with_baseline(*vars_to_gather_cols: Optional[list] = None*, *vars_to_gather_rows: Optional[list] = None*, *detailed_cols: Optional[list] = None*, *detailed_rows: Optional[list] = None*, *custom_cols_order: Optional[list] = None*, *custom_rows_order: Optional[list] = None*, *data_on_y_axis_baseline_plot: Optional[list] = None*, *baseline: Optional[str] = None*, *colorlist_baseline_plot_data: Optional[list] = None*, *best_fit_deg: Optional[list] = None*, *rows_renaming_dict: Optional[dict] = None*, *cols_renaming_dict: Optional[dict] = None*, *supxlabel: Optional[str] = None*, *supylabel: Optional[str] = None*, *figname: Optional[str] = None*, *figsize: int = 1*, *markersize: int = 1*, *dpi: int = 500*, *confirm_graph: bool = False*, *set_facecolor: any = (0, 0, 0, 0.1)*, *best_fit_background_linewidth: float = 1*, *best_fit_linewidth: float = 0.5*, *best_fit_linestyle: any = (0, (5, 10))*)

Used to plot a scatter plot with baseline.

Parameters

- **vars_to_gather_cols** (*list*) – A list of strings. The list should be the variables you want to show in subplot columns.
- **vars_to_gather_rows** (*list*) – A list of strings. The list should be the variables you want to show in subplot rows.
- **detailed_cols** (*list*) – A list of strings. The list should be the specific data you want to show in subplots columns. Used to filter.
- **detailed_rows** (*list*) – A list of strings. The list should be the specific data you want to show in subplots rows. Used to filter.
- **custom_cols_order** (*list*) – A list of strings. The list should be the specific order for the items shown in subplot columns.

- **custom_rows_order** (*list*) – A list of strings. The list should be the specific order for the items shown in subplot rows.
- **data_on_y_axis_baseline_plot** (*list*) – A list of strings. Used to select the data you want to show in the graph. Should be a list of the column names you want to plot in each subplot.
- **baseline** (*str*) – A string, used only in data_on_y_axis_baseline_plot. The baseline should be one of the combinations in vars_to_gather_cols. It will be plotted in x-axis, while the reference combination for comparison in y-axis.
- **colorlist_baseline_plot_data** (*list*) – A list of strings. Should be the colors using the matplotlib color notation for the columns entered in data_on_y_axis_baseline_plot in the same order.
- **best_fit_deg** (*list*) – A list with nested lists and strings. It should follow the same structure as data_on_y_axis_baseline_plot, but replacing the column names with the polynomial degree for the best fit lines.
- **rows_renaming_dict** (*dict*) – A dictionary. Should follow the pattern {'old row name 1': 'new row name 1', 'old row name 2': 'new row name 2'}
- **cols_renaming_dict** (*dict*) – A dictionary. Should follow the pattern {'old col name 1': 'new col name 1', 'old col name 2': 'new col name 2'}
- **supxlabel** (*str*) – A string. The label shown in the x-axis.
- **supylabel** (*str*) – A string. The label shown in the y-axis.
- **figname** (*str*) – A string. The name of the saved figure without extension.
- **figsize** (*float*) – A float. It is the figure size.
- **markersize** (*int*) – An integer. The size of the markers.
- **dpi** (*int*) – An integer. The number of dpis for image quality.
- **confirm_graph** (*bool*) – A bool. True to skip confirmation step.
- **best_fit_linestyle** (*any*) – Anything in matplotlib linestyle notation. Use to change the style of the best fit lines.
- **best_fit_linewidth** (*float*) – A float. Used to change the width of the best fit lines.
- **best_fit_background_linewidth** (*float*) – A float. Used to change the width of the background best fit lines. Must be greater than best_fit_linewidth.

time_plot(*vars_to_gather_cols: Optional[list] = None*, *vars_to_gather_rows: Optional[list] = None*, *detailed_cols: Optional[list] = None*, *detailed_rows: Optional[list] = None*, *custom_cols_order: Optional[list] = None*, *custom_rows_order: Optional[list] = None*, *data_on_y_main_axis: Optional[list] = None*, *data_on_y_sec_axis: Optional[list] = None*, *colorlist_y_main_axis: Optional[list] = None*, *colorlist_y_sec_axis: Optional[list] = None*, *rows_renaming_dict: Optional[dict] = None*, *cols_renaming_dict: Optional[dict] = None*, *sharex: bool = True*, *sharey: bool = True*, *figname: Optional[str] = None*, *figsize: float = 1*, *ratio_height_to_width: float = 1*, *dpi: int = 500*, *confirm_graph: bool = False*, *set_facecolor: any = (0, 0, 0, 0.1)*)

Used to plot a timeplot.

Parameters

- **vars_to_gather_cols** (*list*) – A list of strings. The list should be the variables you want to show in subplot columns.
- **vars_to_gather_rows** (*list*) – A list of strings. The list should be the variables you want to show in subplot rows.

- **detailed_cols** (*list*) – A list of strings. The list should be the specific data you want to show in subplots columns. Used to filter.
- **detailed_rows** (*list*) – A list of strings. The list should be the specific data you want to show in subplots rows. Used to filter.
- **custom_cols_order** (*list*) – A list of strings. The list should be the specific order for the items shown in subplot columns.
- **custom_rows_order** (*list*) – A list of strings. The list should be the specific order for the items shown in subplot rows.
- **data_on_y_main_axis** (*list*) – A list with nested lists and strings. Used to select the data you want to show in the scatter plot main y-axis. It needs to follow this structure: [['name_on_y_main_axis', [list of column names you want to plot]]]
- **data_on_y_sec_axis** (*list*) – A list with nested lists and strings. Used to select the data you want to show in the scatter plot secondary y-axis. It needs to follow this structure: [[['name_on_1st_y_sec_axis', [list of column names you want to plot]], ['name_on_2nd_y_sec_axis', [list of column names you want to plot]], etc]
- **colorlist_y_main_axis** (*list*) – A list with nested lists and strings. It should follow the same structure as data_on_y_main_axis, but replacing the column names with the colors using the matplotlib notation.
- **colorlist_y_sec_axis** (*list*) – A list with nested lists and strings. It should follow the same structure as data_on_y_sec_axis, but replacing the column names with the colors using the matplotlib notation.
- **rows_renaming_dict** (*dict*) – A dictionary. Should follow the pattern {'old row name 1': 'new row name 1', 'old row name 2': 'new row name 2'}
- **cols_renaming_dict** (*dict*) – A dictionary. Should follow the pattern {'old col name 1': 'new col name 1', 'old col name 2': 'new col name 2'}
- **sharey** (*bool*) – True to share the x-axis across all subplots
- **sharex** (*bool*) – True to share the y-axis across all subplots
- **figname** (*str*) – A string. The name of the saved figure without extension.
- **figsize** (*float*) – A float. It is the figure size.
- **ratio_height_to_width** (*float*) – A float. By default, is 1 (squared). If 0.5 is entered, the figure will be half higher than wide.
- **dpi** (*int*) – An integer. The number of dpis for image quality.
- **confirm_graph** (*bool*) – A bool. True to skip confirmation step.
- **set_facecolor** (*any*) – Usage is similar to matplotlib.axes.Axes.set_facecolor

wrangled_table(*reshaping: Optional[str] = None*, *vars_to_gather: Optional[list] = None*, *baseline: Optional[str] = None*, *comparison_mode: list = ['others compared to baseline']*, *comparison_cols: Optional[list] = None*, *check_index_and_cols: bool = False*, *vars_to_keep: Optional[list] = None*, *rename_dict: Optional[dict] = None*, *transpose: bool = False*, *excel_filename: Optional[str] = None*)

Creates a table based on the arguments.

Parameters

- **reshaping** (*str*) – A string. Can be 'pivot', 'unstack' or 'multiindex', to perform these actions.

- **vars_to_gather** (*list*) – A list of the variables to be transposed from rows to columns.
- **baseline** (*str*) – The already transposed column you want to use as a baseline for comparisons. If omitted, you will be asked which one to use.
- **comparison_mode** (*list*) – A list of strings. Can be 'others compared to baseline' and/or 'baseline compared to others'. Used to customise the comparison of variables.
- **comparison_cols** (*list*) – A list of strings. 'absolute' to get the difference or 'relative' to get the percentage of reduction.
- **check_index_and_cols** (*bool*) – A boolean. True to check index and cols, False to skip.
- **vars_to_keep** (*list*) – A list of strings. To remove all variables from the multiindex except those to be kept.
- **excel_filename** (*str*) – A string. If entered, the wrangled_df will be exported to excel with that string as name.
- **transpose** (*bool*) – True to transpose the dataframe
- **rename_dict** (*dict*) – Renames all data in the dataframe based on the format {'old_string': 'new_string'}

accim.data.data_postprocessing.**genCSVconcatenated**(*datasets: Optional[list] = None*, *source_frequency: Optional[str] = None*, *frequency: Optional[str] = None*, *datasets_per_chunk: int = 50*, *concatenated_csv_name: Optional[str] = None*, *drop_nan: bool = True*)

Function to generate concatenated CSV files from a large number of CSV files resulting from simulation runs. Useful in cases there are many CSVs, which could cause memory errors.

Parameters

- **datasets** (*list*) – List of strings containing the names of the CSV files to be concatenated. If omitted, all CSV files are concatenated.
- **source_frequency** (*str*) – Used to inform accim about the frequency of the input CSVs. Strings can be 'timestep', 'hourly', 'daily', 'monthly' or 'runperiod'.
- **frequency** (*str*) – Rows will be aggregated based on this frequency. Strings can be 'timestep', 'hourly', 'daily', 'monthly' or 'runperiod'.
- **datasets_per_chunk** (*int*) – The number of CSV files for chuck to be concatenated.
- **concatenated_csv_name** (*str*) – A string used as the name for the concatenated csv file.
- **drop_nan** (*bool*) – True to drop nan values.

13.1.1.1.3 accim.data.data_preprocessing module

Submodule to perform data processing before simulation run.

class accim.data.data_preprocessing.**give_address**(*latitude: float*, *longitude: float*)

Bases: object

Search address from coordinates using nominatim.openstreetmap.org. Version 3 to avoid ssl error.

Parameters

- **latitude** (*float*) – The latitude from the EPW file.
- **longitude** (*float*) – The longitude from the EPW file.

class accim.data.data_preprocessing.**give_address_openssl**(*latitude: float*, *longitude: float*)

Bases: object

Search address from coordinates using nominatim.openstreetmap.org. Version 2 to avoid ssl error.

Parameters

- **latitude** (*float*) – The latitude from the EPW file.
- **longitude** (*float*) – The longitude from the EPW file.

class accim.data.data_preprocessing.**give_address_ssl**(*latitude: float*, *longitude: float*)

Bases: object

Search address from coordinates using nominatim.openstreetmap.org. Version 1 to avoid ssl error.

Parameters

- **latitude** (*float*) – The latitude from the EPW file.
- **longitude** (*float*) – The longitude from the EPW file.

class accim.data.data_preprocessing.**rename_epw_files**(*filelist=None*, *rename_dict: Optional[dict] = None*, *confirm_renaming=None*, *confirm_deletion=None*)

Bases: object

Renames the EPW files following the name convention 'Country_City_RCPscenario-Year'. The Country and City fields are computed based on the coordinates of the EPW, and the RCPscenario and Year are taken from the original name. If no reference is found, the sample_EPWs are considered to be for Present scenario.

Parameters

- **filelist** (*list*) – A list of the EPW files. If omitted, it will rename all sample_EPWs in that folder.
- **rename_dict** (*dict*) – A dict to set the city field for each EPW file. It must follow the pattern {'city name to be search in epw file name': 'city name for the epw file if found`}
- **confirm_renaming** (*bool*) – True or False, to skip renaming confirmation on prompt command or console
- **confirm_deletion** (*bool*) – True or False, to skip deletion confirmation on prompt command or console

13.1.1.1.4 Module contents

13.1.1.2 accim.run package

13.1.1.2.1 Submodules

13.1.1.2.2 accim.run.run module

Multiprocessing runs.

using generators instead of a list when you are running 100 files you have to use generators original script: https://eppy.readthedocs.io/en/latest/runningeplus.html slightly modified so that takes multiple sample_EPWs located in the local folder

accim.run.run.**make_eplaunch_options**(*idf*, *epw*)

Make options for run, so that it runs like EPLaunch on Windows.

accim.run.run.**removefiles**()

Delete all files except '.py', '.idf', '.epw', '.csv' and '.eso'.

'Table.csv', 'Meter.csv', 'Zsz.csv' files are deleted as well.

accim.run.run.**runEp**(*runOnlyAccim: Optional[bool] = None*, *confirmRun: Optional[bool] = None*, *num_CPUs: int = 2*, *EnergyPlus_version: Optional[str] = None*)

Run simulations in the latest EnergyPlus version installed in the computer.

Parameters

- **runOnlyAccim** (*bool*) – Default is None. Enter True to run only ACCIM output IDFs, or False to run all IDFs.
- **confirmRun** (*bool*) – Default is None. Enter True to run all simulations regardless the no. of them, or False to shut down all runs.
- **num_CPUs** (*int*) – An integer. The number of CPUs to be used.
- **EnergyPlus_version** (*str*) – A string. It should be the EnergyPlus version of the IDFs, from '9.0' to '23.1'.

13.1.1.2.3 Module contents

13.1.1.3 accim.sim package

13.1.1.3.1 Submodules

13.1.1.3.2 accim.sim.accim_Base module

Add EnergyPlus objects in common to both ExistingHVAC and VRFsystem.

accim.sim.accim_Base.**saveaccim**(*self*, *verboseMode: bool = True*)

Save IDF.

Parameters

verboseMode – Inherited from class *accim.sim.accis.addAccis*

accim.sim.accim_Base.**setComfFieldsPeople**(*self*, *EnergyPlus_version: Optional[str] = None*, *TempCtrl: Optional[str] = None*, *verboseMode: bool = True*)

Amend PEOPLE objects so that accim can work. Copy existing PEOPLE objects and adds AdaptiveASH55 and AdaptiveCEN15251 to Thermal Comfort Model types 1 and 2 fields of the existing People objects.

Parameters

- **EnergyPlus_version** – Inherited from class *accim.sim.accis.addAccis*
- **TempCtrl** – Inherited from class *accim.sim.accis.addAccis*
- **verboseMode** – Inherited from class *accim.sim.accis.addAccis*

accim.sim.accim_Base.**setPMVsetpoint**(*self*, *verboseMode: bool = True*)

Sets PMV setpoints for temperature control.

Parameters

verboseMode – Inherited from class *accim.sim.accis.addAccis*

13.1.1.3.3 accim.sim.accim_Base_EMS module

Add EMS objects in common to both ExistingHVAC and VRFsystem.

accim.sim.accim_Base_EMS.**addEMSActuatorsBase**(*self*, *ScriptType: Optional[str] = None*, *verboseMode: bool = True*)

Add EMS actuators for accim.

Parameters

- **self** – Used as a method for :class:accim.sim.accim_Main.accimJob
- **ScriptType** – Inherited from :class:accim.sim.accis.addAccis
- **verboseMode** – Inherited from :class:accim.sim.accis.addAccis

accim.sim.accim_Base_EMS.**addEMSOutputVariableBase**(*self*, *ScriptType: Optional[str] = None*, *verboseMode: bool = True*)

Add EMS output variables for Base accim. Checks if some EMS output variables objects are already in the model, and otherwise adds them.

Parameters

- **self** – Used as a method for class accim.sim.accim_Main.accimJob
- **ScriptType** – Inherited from :class:accim.sim.accis.addAccis
- **verboseMode** – Inherited from :class:accim.sim.accis.addAccis

accim.sim.accim_Base_EMS.**addEMSPCMBase**(*self*, *verboseMode: bool = True*)

Add EMS program calling managers for Base accim. Checks if some EMS program calling manager objects are already in the model, and otherwise adds them.

Parameters

- **self** – Used as a method for class accim.sim.accim_Main.accimJob
- **verboseMode** – Inherited from class accim.sim.accis.addAccis

accim.sim.accim_Base_EMS.**addEMSProgramsBase**(*self*, *ScriptType: Optional[str] = None*, *verboseMode: bool = True*)

Add EMS programs for Base accim. Checks if some programs objects are already in the model, and otherwise adds them.

Parameters

- **ScriptType** – Inherited from class *accim.sim.accis.addAccis*
- **verboseMode** – Inherited from class *accim.sim.accis.addAccis*

accim.sim.accim_Base_EMS.**addEMSSensorsBase**(*self*, *ScriptType: Optional[str] = None*, *verboseMode: bool = True*)

Add EMS sensors for accim.

Parameters

- **self** – Used as a method for :class:accim.sim.accim_Main.accimJob
- **ScriptType** – Inherited from :class:accim.sim.accis.addAccis
- **verboseMode** – Inherited from :class:accim.sim.accis.addAccis

accim.sim.accim_Base_EMS.**addGlobVarList**(*self*, *ScriptType: Optional[str] = None*, *verboseMode: bool = True*)

Remove existing Global Variable objects and add correct Global Variable objects for accim.

Parameters

- **self** – Used as a method for :class:accim.sim.accim_Main.accimJob
- **ScriptType** – Inherited from :class:accim.sim.accis.addAccis
- **verboseMode** – Inherited from :class:accim.sim.accis.addAccis

accim.sim.accim_Base_EMS.**addIntVarList**(*self*, *verboseMode: bool = True*)

Add Internal variables objects for accim.

Parameters

- **self** – Used as a method for :class:accim.sim.accim_Main.accimJob
- **verboseMode** – Inherited from :class:accim.sim.accis.addAccis

accim.sim.accim_Base_EMS.**addOutputVariablesDetailed**(*self*, *Outputs_freq: Optional[any] = None*, *verboseMode: bool = True*)

Add Output:Variable objects for accim.

Parameters

- **self** – Used as a method for :class:accim.sim.accim_Main.accimJob
- **Outputs_freq** – Inherited from :class:accim.sim.accis.addAccis
- **verboseMode** – Inherited from :class:accim.sim.accis.addAccis

accim.sim.accim_Base_EMS.**addOutputVariablesSimplified**(*self*, *Outputs_freq: Optional[any] = None*, *TempCtrl: Optional[str] = None*, *verboseMode: bool = True*)

Add simplified Output:Variable objects for accim. Remove all outputs and add only VFR outdoor unit consumption and operative temperature.

Parameters

- **self** – Used as a method for :class:accim.sim.accim_Main.accimJob
- **Outputs_freq** – Inherited from :class:accim.sim.accis.addAccis
- **TempCtrl** – Inherited from :class:accim.sim.accis.addAccis
- **verboseMode** – Inherited from :class:accim.sim.accis.addAccis

accim.sim.accim_Base_EMS.**addOutputVariablesStandard**(*self*, *Outputs_freq: Optional[any] = None*, *ScriptType: Optional[str] = None*, *TempCtrl: Optional[str] = None*, *verboseMode: bool = True*)

Add Output:Variable objects for accim.

Parameters

- **self** – Used as a method for :class:accim.sim.accim_Main.accimJob
- **Outputs_freq** – Inherited from :class:accim.sim.accis.addAccis
- **ScriptType** – Inherited from :class:accim.sim.accis.addAccis
- **TempCtrl** – Inherited from :class:accim.sim.accis.addAccis

- **verboseMode** – Inherited from :class:accim.sim.accis.addAccis

accim.sim.accim_Base_EMS.**genOutputDataframe**(*self*, *idf_filename: Optional[str] = None*)

Used to generate a pandas DataFrame instance containing all Output:Variable objects in the model.

Parameters

- **self** – Used as a method for :class:accim.sim.accim_Main.accimJob
- **idf_filename** – Inherited from :class:accim.sim.accis.addAccis

accim.sim.accim_Base_EMS.**outputsSpecified**(*self*, *remove_or_keep: Optional[str] = None*)

Remove duplicated Output:Variable objects for accim.

Parameters

- **self** – Used as a method for :class:accim.sim.accim_Main.accimJob
- **remove_or_keep** – Inherited from :class:accim.sim.accis.addAccis

accim.sim.accim_Base_EMS.**removeDuplicatedOutputVariables**(*self*)

Remove duplicated Output:Variable objects for accim.

Parameters

self – Used as a method for :class:accim.sim.accim_Main.accimJob

accim.sim.accim_Base_EMS.**removeExistingOutputVariables**(*self*)

Remove existing Output:Variable objects for accim.

Parameters

self – Used as a method for :class:accim.sim.accim_Main.accimJob

accim.sim.accim_Base_EMS.**takeOutputDataFrame**(*self*, *idf_filename*, *df_outputs_in*, *verboseMode*)

Used to read a pandas DataFrame containing the Output:Variable objects to be kept.

Parameters

- **self** – Used as a method for :class:accim.sim.accim_Main.accimJob
- **idf_filename** – Inherited from :class:accim.sim.accis.addAccis
- **df_outputs_in** – Inherited from :class:accim.sim.accis.addAccis
- **verboseMode** – Inherited from :class:accim.sim.accis.addAccis

13.1.1.3.4 accim.sim.accim_ExistingHVAC module

Module for function in EnergyPlus scope related to models with existing HVAC systems

accim.sim.accim_ExistingHVAC.**addForscriptSchExistHVAC**(*self*, *verboseMode: bool = True*)

Add Schedules for each zone in existing HVAC zones to override the existing setpoint temperatures.

Parameters

- **self** – Used as a method for class accim.sim.accim_Main.accimJob
- **verboseMode** – Inherited from class accim.sim.accis.addAccis

13.1.1.3.5 accim.sim.accim_ExistingHVAC_EMS module

Module for EMS functions and models with existing HVAC systems

accim.sim.accim_ExistingHVAC_EMS.**addEMSSensorsExisHVAC**(*self*, *verboseMode: bool = True*)

Adds the EMS sensors for models with existing HVAC system.

Parameters

- **self** – Used as a method for class accim.sim.accim_Main.accimJob
- **verboseMode** – Inherited from class accim.sim.accis.addAccis

13.1.1.3.6 accim.sim.accim_IDFgeneration module

Generate IDFs.

accim.sim.accim_IDFgeneration.**genIDF**(*self*, *ScriptType: Optional[str] = None*, *TempCtrl: Optional[str] = None*, *ComfStand=None*, *CAT=None*, *ComfMod=None*, *SetpointAcc=10000*, *CoolSeasonStart=121*, *CoolSeasonEnd=274*, *HVACmode=None*, *VentCtrl=None*, *MaxTempDiffVOF=20*, *MinTempDiffVOF=0.5*, *MultiplierVOF=0.25*, *VSToffset=[0]*, *MinOToffset=[50]*, *MaxWindSpeed=[50]*, *ASTtol_start=0.1*, *ASTtol_end_input=0.1*, *ASTtol_steps=0.1*, *NameSuffix=''*, *verboseMode: bool = True*, *confirmGen: Optional[bool] = None*)

Generate IDFs.

Parameters

- **self** – Used as a method for class accim.sim.accim_Main.accimJob
- **ScriptType** – Inherited from class accim.sim.accis.addAccis
- **TempCtrl** – Inherited from class accim.sim.accis.addAccis
- **ComfStand** – Inherited from class accim.sim.accis.addAccis
- **CAT** – Inherited from class accim.sim.accis.addAccis
- **ComfMod** – Inherited from :class:accim.sim.accis.addAccis
- **SetpointAcc** – Inherited from :class:accim.sim.accis.addAccis
- **CoolSeasonStart** – Inherited from :class:accim.sim.accis.addAccis
- **CoolSeasonEnd** – Inherited from :class:accim.sim.accis.addAccis
- **HVACmode** – Inherited from :class:accim.sim.accis.addAccis
- **VentCtrl** – Inherited from :class:accim.sim.accis.addAccis
- **MaxTempDiffVOF** – Inherited from :class:accim.sim.accis.addAccis
- **MinTempDiffVOF** – Inherited from :class:accim.sim.accis.addAccis
- **MultiplierVOF** – Inherited from :class:accim.sim.accis.addAccis
- **VSToffset** – Inherited from :class:accim.sim.accis.addAccis
- **MinOToffset** – Inherited from :class:accim.sim.accis.addAccis
- **MaxWindSpeed** – Inherited from :class:accim.sim.accis.addAccis
- **ASTtol_start** – Inherited from :class:accim.sim.accis.addAccis

- **ASTtol_end_input** – Inherited from :class:accim.sim.accis.addAccis
- **ASTtol_steps** – Inherited from :class:accim.sim.accis.addAccis
- **NameSuffix** – Inherited from :class:accim.sim.accis.addAccis
- **verboseMode** – Inherited from :class:accim.sim.accis.addAccis
- **confirmGen** – Inherited from :class:accim.sim.accis.addAccis

accim.sim.accim_IDFgeneration.**inputData**(*self*, *ScriptType: Optional[str] = None*)

Input data for IDF generation.

Parameters

- **self** – Used as a method for class accim.sim.accim_Main.accimJob
- **ScriptType** – Inherited from class accim.sim.accis.addAccis

13.1.1.3.7 accim.sim.accim_Main module

Class for accim.

class accim.sim.accim_Main.**accimJob**(*filename_temp*, *ScriptType: Optional[str] = None*, *EnergyPlus_version: Optional[str] = None*, *TempCtrl: Optional[str] = None*, *verboseMode: bool = True*, *accimNotWorking: bool = False*)

Bases: object

Class to start the process to add the class accim.sim.accis.addAccis.

Parameters

- **filename_temp** – the filename of the idf
- **ScriptType** – Inherited from class accim.sim.accis.addAccis
- **EnergyPlus_version** – Inherited from class accim.sim.accis.addAccis
- **TempCtrl** – Inherited from class accim.sim.accis.addAccis
- **verboseMode** – Inherited from class accim.sim.accis.addAccis
- **accimNotWorking** – True if problems detected in class accim.sim.accis.addAccis

addBaseSchedules(*verboseMode: bool = True*)

Amend Schedule:Compact objects. Checks Schedule:Compact objects needed for accim, and add them in case these are not in the model

Parameters

- **self** – Used as a method for class accim.sim.accim_Main.accimJob
- **verboseMode** – Inherited from class accim.sim.accis.addAccis

addCurveObj(*verboseMode: bool = True*)

Add Curve Objects needed for VRFsystem to work.

Parameters

- **self** – Used as a method for class accim.sim.accim_Main.accimJob
- **verboseMode** – Inherited from class accim.sim.accis.addAccis

addDetHVACobj(*EnergyPlus_version: Optional[str] = None*, *verboseMode: bool = True*, *SupplyAirTempInputMethod: Optional[str] = None*)

Add Detailed HVAC objects for VRFsystem to work.

Parameters

- **self** – Used as a method for class accim.sim.accim_Main.accimJob
- **EnergyPlus_version** – Inherited from class accim.sim.accis.addAccis
- **verboseMode** – Inherited from class accim.sim.accis.addAccis
- **SupplyAirTempInputMethod** – Inherited from class accim.sim.accis.addAccis

addEMSActuatorsBase(*ScriptType: Optional[str] = None*, *verboseMode: bool = True*)

Add EMS actuators for accim.

Parameters

- **self** – Used as a method for :class:accim.sim.accim_Main.accimJob
- **ScriptType** – Inherited from :class:accim.sim.accis.addAccis
- **verboseMode** – Inherited from :class:accim.sim.accis.addAccis

addEMSOutputVariableBase(*ScriptType: Optional[str] = None*, *verboseMode: bool = True*)

Add EMS output variables for Base accim. Checks if some EMS output variables objects are already in the model, and otherwise adds them.

Parameters

- **self** – Used as a method for class accim.sim.accim_Main.accimJob
- **ScriptType** – Inherited from :class:accim.sim.accis.addAccis
- **verboseMode** – Inherited from :class:accim.sim.accis.addAccis

addEMSPCMBase(*verboseMode: bool = True*)

Add EMS program calling managers for Base accim. Checks if some EMS program calling manager objects are already in the model, and otherwise adds them.

Parameters

- **self** – Used as a method for class accim.sim.accim_Main.accimJob
- **verboseMode** – Inherited from class accim.sim.accis.addAccis

addEMSProgramsBase(*ScriptType: Optional[str] = None*, *verboseMode: bool = True*)

Add EMS programs for Base accim. Checks if some programs objects are already in the model, and otherwise adds them.

Parameters

- **ScriptType** – Inherited from class *accim.sim.accis.addAccis*
- **verboseMode** – Inherited from class *accim.sim.accis.addAccis*

addEMSSensorsBase(*ScriptType: Optional[str] = None*, *verboseMode: bool = True*)

Add EMS sensors for accim.

Parameters

- **self** – Used as a method for :class:accim.sim.accim_Main.accimJob
- **ScriptType** – Inherited from :class:accim.sim.accis.addAccis

- **verboseMode** – Inherited from :class:accim.sim.accis.addAccis

addEMSSensorsExisHVAC(*verboseMode: bool = True*)

Adds the EMS sensors for models with existing HVAC system.

Parameters

- **self** – Used as a method for class accim.sim.accim_Main.accimJob
- **verboseMode** – Inherited from class accim.sim.accis.addAccis

addEMSSensorsVRFsystem(*ScriptType: Optional[str] = None*, *verboseMode: bool = True*)

Add EMS sensors for VRF system accim.

Parameters

- **self** – Used as a method for class accim.sim.accim_Main.accimJob
- **ScriptType** – Inherited from class accim.sim.accis.addAccis
- **verboseMode** – Inherited from class accim.sim.accis.addAccis

addForscriptSchExistHVAC(*verboseMode: bool = True*)

Add Schedules for each zone in existing HVAC zones to override the existing setpoint temperatures.

Parameters

- **self** – Used as a method for class accim.sim.accim_Main.accimJob
- **verboseMode** – Inherited from class accim.sim.accis.addAccis

addForscriptSchVRFsystem(*verboseMode: bool = True*)

Add FORSCRIPT Schedules for each zone for VRFsystem.

Parameters

- **self** – Used as a method for class accim.sim.accim_Main.accimJob
- **verboseMode** – Inherited from :class:accim.sim.accis.addAccis

addGlobVarList(*ScriptType: Optional[str] = None*, *verboseMode: bool = True*)

Remove existing Global Variable objects and add correct Global Variable objects for accim.

Parameters

- **self** – Used as a method for :class:accim.sim.accim_Main.accimJob
- **ScriptType** – Inherited from :class:accim.sim.accis.addAccis
- **verboseMode** – Inherited from :class:accim.sim.accis.addAccis

addIntVarList(*verboseMode: bool = True*)

Add Internal variables objects for accim.

Parameters

- **self** – Used as a method for :class:accim.sim.accim_Main.accimJob
- **verboseMode** – Inherited from :class:accim.sim.accis.addAccis

addOpTempTherm(*verboseMode: bool = True*)

Amend ZoneControl:Thermostat:OperativeTemperature objects. Add ZoneControl:Thermostat:OperativeTemperature objects for each zone.

Parameters

- **self** – Used as a method for class accim.sim.accim_Main.accimJob

- **verboseMode** – Inherited from class accim.sim.accis.addAccis

addOutputVariablesDetailed(*Outputs_freq: Optional[any] = None*, *verboseMode: bool = True*)

Add Output:Variable objects for accim.

Parameters

- **self** – Used as a method for :class:accim.sim.accim_Main.accimJob
- **Outputs_freq** – Inherited from :class:accim.sim.accis.addAccis
- **verboseMode** – Inherited from :class:accim.sim.accis.addAccis

addOutputVariablesSimplified(*Outputs_freq: Optional[any] = None*, *TempCtrl: Optional[str] = None*, *verboseMode: bool = True*)

Add simplified Output:Variable objects for accim. Remove all outputs and add only VFR outdoor unit consumption and operative temperature.

Parameters

- **self** – Used as a method for :class:accim.sim.accim_Main.accimJob
- **Outputs_freq** – Inherited from :class:accim.sim.accis.addAccis
- **TempCtrl** – Inherited from :class:accim.sim.accis.addAccis
- **verboseMode** – Inherited from :class:accim.sim.accis.addAccis

addOutputVariablesStandard(*Outputs_freq: Optional[any] = None*, *ScriptType: Optional[str] = None*, *TempCtrl: Optional[str] = None*, *verboseMode: bool = True*)

Add Output:Variable objects for accim.

Parameters

- **self** – Used as a method for :class:accim.sim.accim_Main.accimJob
- **Outputs_freq** – Inherited from :class:accim.sim.accis.addAccis
- **ScriptType** – Inherited from :class:accim.sim.accis.addAccis
- **TempCtrl** – Inherited from :class:accim.sim.accis.addAccis
- **verboseMode** – Inherited from :class:accim.sim.accis.addAccis

addVRFsystemSch(*verboseMode: bool = True*)

Amend Schedule:Compact objects for VRFsystem. Add Schedule:Compact objects needed for VRFsystem to work, other than AHST_Sch and ACST_Sch Schedules.

Parameters

- **self** – Used as a method for class accim.sim.accim_Main.accimJob
- **verboseMode** – Inherited from class accim.sim.accis.addAccis

checkVentIsOn(*verboseMode: bool = True*)

Check ventilation settings.

Parameters

- **self** – Used as a method for :class:accim.sim.accim_Main.accimJob
- **verboseMode** – Inherited from :class:accim.sim.accis.addAccis

genIDF(*ScriptType: Optional[str] = None*, *TempCtrl: Optional[str] = None*, *ComfStand=None*, *CAT=None*, *ComfMod=None*, *SetpointAcc=10000*, *CoolSeasonStart=121*, *CoolSeasonEnd=274*, *HVACmode=None*, *VentCtrl=None*, *MaxTempDiffVOF=20*, *MinTempDiffVOF=0.5*, *MultiplierVOF=0.25*, *VSToffset=[0]*, *MinOToffset=[50]*, *MaxWindSpeed=[50]*, *ASTtol_start=0.1*, *ASTtol_end_input=0.1*, *ASTtol_steps=0.1*, *NameSuffix=''*, *verboseMode: bool = True*, *confirmGen: Optional[bool] = None*)

Generate IDFs.

Parameters

- **self** – Used as a method for class accim.sim.accim_Main.accimJob
- **ScriptType** – Inherited from class accim.sim.accis.addAccis
- **TempCtrl** – Inherited from class accim.sim.accis.addAccis
- **ComfStand** – Inherited from class accim.sim.accis.addAccis
- **CAT** – Inherited from class accim.sim.accis.addAccis
- **ComfMod** – Inherited from :class:accim.sim.accis.addAccis
- **SetpointAcc** – Inherited from :class:accim.sim.accis.addAccis
- **CoolSeasonStart** – Inherited from :class:accim.sim.accis.addAccis
- **CoolSeasonEnd** – Inherited from :class:accim.sim.accis.addAccis
- **HVACmode** – Inherited from :class:accim.sim.accis.addAccis
- **VentCtrl** – Inherited from :class:accim.sim.accis.addAccis
- **MaxTempDiffVOF** – Inherited from :class:accim.sim.accis.addAccis
- **MinTempDiffVOF** – Inherited from :class:accim.sim.accis.addAccis
- **MultiplierVOF** – Inherited from :class:accim.sim.accis.addAccis
- **VSToffset** – Inherited from :class:accim.sim.accis.addAccis
- **MinOToffset** – Inherited from :class:accim.sim.accis.addAccis
- **MaxWindSpeed** – Inherited from :class:accim.sim.accis.addAccis
- **ASTtol_start** – Inherited from :class:accim.sim.accis.addAccis
- **ASTtol_end_input** – Inherited from :class:accim.sim.accis.addAccis
- **ASTtol_steps** – Inherited from :class:accim.sim.accis.addAccis
- **NameSuffix** – Inherited from :class:accim.sim.accis.addAccis
- **verboseMode** – Inherited from :class:accim.sim.accis.addAccis
- **confirmGen** – Inherited from :class:accim.sim.accis.addAccis

genOutputDataframe(*idf_filename: Optional[str] = None*)

Used to generate a pandas DataFrame instance containing all Output:Variable objects in the model.

Parameters

- **self** – Used as a method for :class:accim.sim.accim_Main.accimJob
- **idf_filename** – Inherited from :class:accim.sim.accis.addAccis

inputData(*ScriptType: Optional[str] = None*)

Input data for IDF generation.

Parameters

- **self** – Used as a method for class accim.sim.accim_Main.accimJob
- **ScriptType** – Inherited from class accim.sim.accis.addAccis

listdir()

Return a list containing the names of the files in the directory.

path can be specified as either str, bytes, or a path-like object. If path is bytes,
the filenames returned will also be bytes; in all other circumstances the filenames returned will be str.

If path is None, uses the path='.'. On some platforms, path may also be specified as an open file descriptor;

the file descriptor must refer to a directory. If this functionality is unavailable, using it raises NotImplementedError.

The list is in arbitrary order. It does not include the special entries '.' and '..' even if they are present in the directory.

numpy = <module 'numpy' from '/home/docs/checkouts/readthedocs.org/user_builds/accim/envs/latest/lib/python3.7/site-packages/numpy/__init__.py'>

outputsSpecified(*remove_or_keep: Optional[str] = None*)

Remove duplicated Output:Variable objects for accim.

Parameters

- **self** – Used as a method for :class:accim.sim.accim_Main.accimJob
- **remove_or_keep** – Inherited from :class:accim.sim.accis.addAccis

removeDuplicatedOutputVariables()

Remove duplicated Output:Variable objects for accim.

Parameters
self – Used as a method for :class:accim.sim.accim_Main.accimJob

removeExistingOutputVariables()

Remove existing Output:Variable objects for accim.

Parameters
self – Used as a method for :class:accim.sim.accim_Main.accimJob

saveaccim(*verboseMode: bool = True*)

Save IDF.

Parameters
verboseMode – Inherited from class *accim.sim.accis.addAccis*

setAvailSchOn(*verboseMode: bool = True*)

Amend availability schedules. Assign On Compact:Schedule to heating and cooling availability schedule names.

Parameters

- **self** – Used as a method for class accim.sim.accim_Main.accimJob
- **verboseMode** – Inherited from class accim.sim.accis.addAccis

setComfFieldsPeople(*EnergyPlus_version: Optional[str] = None*, *TempCtrl: Optional[str] = None*, *verboseMode: bool = True*)

Amend PEOPLE objects so that accim can work. Copy existing PEOPLE objects and adds AdaptiveASH55 and AdaptiveCEN15251 to Thermal Comfort Model types 1 and 2 fields of the existing People objects.

Parameters

- **EnergyPlus_version** – Inherited from class *accim.sim.accis.addAccis*
- **TempCtrl** – Inherited from class *accim.sim.accis.addAccis*
- **verboseMode** – Inherited from class *accim.sim.accis.addAccis*

setPMVsetpoint(*verboseMode: bool = True*)

Sets PMV setpoints for temperature control.

Parameters
verboseMode – Inherited from class *accim.sim.accis.addAccis*

takeOutputDataFrame(*idf_filename*, *df_outputs_in*, *verboseMode*)

Used to read a pandas DataFrame containing the Output:Variable objects to be kept.

Parameters

- **self** – Used as a method for :class:`accim.sim.accim_Main.accimJob`
- **idf_filename** – Inherited from :class:`accim.sim.accis.addAccis`
- **df_outputs_in** – Inherited from :class:`accim.sim.accis.addAccis`
- **verboseMode** – Inherited from :class:`accim.sim.accis.addAccis`

13.1.1.3.8 accim.sim.accim_VRFsystem module

Add EnergyPlus objects only for VRFsystem.

`accim.sim.accim_VRFsystem.`**addBaseSchedules**(*self*, *verboseMode: bool = True*)

Amend Schedule:Compact objects. Checks Schedule:Compact objects needed for accim, and add them in case these are not in the model

Parameters

- **self** – Used as a method for class `accim.sim.accim_Main.accimJob`
- **verboseMode** – Inherited from class `accim.sim.accis.addAccis`

`accim.sim.accim_VRFsystem.`**addCurveObj**(*self*, *verboseMode: bool = True*)

Add Curve Objects needed for VRFsystem to work.

Parameters

- **self** – Used as a method for class `accim.sim.accim_Main.accimJob`
- **verboseMode** – Inherited from class `accim.sim.accis.addAccis`

`accim.sim.accim_VRFsystem.`**addDetHVACobj**(*self*, *EnergyPlus_version: Optional[str] = None*, *verboseMode: bool = True*, *SupplyAirTempInputMethod: Optional[str] = None*)

Add Detailed HVAC objects for VRFsystem to work.

Parameters

- **self** – Used as a method for class `accim.sim.accim_Main.accimJob`

- **EnergyPlus_version** – Inherited from class accim.sim.accis.addAccis
- **verboseMode** – Inherited from class accim.sim.accis.addAccis
- **SupplyAirTempInputMethod** – Inherited from class accim.sim.accis.addAccis

accim.sim.accim_VRFsystem.**addForscriptSchVRFsystem**(*self*, *verboseMode: bool = True*)

Add FORSCRIPT Schedules for each zone for VRFsystem.

Parameters

- **self** – Used as a method for class accim.sim.accim_Main.accimJob
- **verboseMode** – Inherited from :class:accim.sim.accis.addAccis

accim.sim.accim_VRFsystem.**addOpTempTherm**(*self*, *verboseMode: bool = True*)

Amend ZoneControl:Thermostat:OperativeTemperature objects. Add ZoneControl:Thermostat:OperativeTemperature objects for each zone.

Parameters

- **self** – Used as a method for class accim.sim.accim_Main.accimJob
- **verboseMode** – Inherited from class accim.sim.accis.addAccis

accim.sim.accim_VRFsystem.**addVRFsystemSch**(*self*, *verboseMode: bool = True*)

Amend Schedule:Compact objects for VRFsystem. Add Schedule:Compact objects needed for VRFsystem to work, other than AHST_Sch and ACST_Sch Schedules.

Parameters

- **self** – Used as a method for class accim.sim.accim_Main.accimJob
- **verboseMode** – Inherited from class accim.sim.accis.addAccis

accim.sim.accim_VRFsystem.**checkVentIsOn**(*self*, *verboseMode: bool = True*)

Check ventilation settings.

Parameters

- **self** – Used as a method for :class:accim.sim.accim_Main.accimJob
- **verboseMode** – Inherited from :class:accim.sim.accis.addAccis

accim.sim.accim_VRFsystem.**setAvailSchOn**(*self*, *verboseMode: bool = True*)

Amend availability schedules. Assign On Compact:Schedule to heating and cooling availability schedule names.

Parameters

- **self** – Used as a method for class accim.sim.accim_Main.accimJob
- **verboseMode** – Inherited from class accim.sim.accis.addAccis

13.1.1.3.9 accim.sim.accim_VRFsystem_EMS module

Add EMS objects only for VRFsystem.

accim.sim.accim_VRFsystem_EMS.**addEMSSensorsVRFsystem**(*self*, *ScriptType: Optional[str] = None*, *verboseMode: bool = True*)

Add EMS sensors for VRF system accim.

Parameters

- **self** – Used as a method for class accim.sim.accim_Main.accimJob

- **ScriptType** – Inherited from class accim.sim.accis.addAccis
- **verboseMode** – Inherited from class accim.sim.accis.addAccis

13.1.1.3.10 accim.sim.accis module

Run the function below to add the ACCIS.

This function transform fixed setpoint temperature building energy models into adaptive setpoint temperature energy models by adding the Adaptive Comfort Control Implementation Script (ACCIS)

class accim.sim.accis.**addAccis**(*ScriptType: Optional[str] = None*, *SupplyAirTempInputMethod: Optional[str] = None*, *Output_type: Optional[str] = None*, *Output_freqs: Optional[any] = None*, *Output_keep_existing: Optional[bool] = None*, *Output_gen_dataframe: Optional[bool] = None*, *Output_take_dataframe: Optional[DataFrame] = None*, *EnergyPlus_version: Optional[str] = None*, *TempCtrl: Optional[str] = None*, *ComfStand: Optional[any] = None*, *CAT: Optional[any] = None*, *ComfMod: Optional[any] = None*, *SetpointAcc: float = 10000*, *CoolSeasonStart: any = 121*, *CoolSeasonEnd: any = 274*, *HVACmode: Optional[any] = None*, *VentCtrl: Optional[any] = None*, *MaxTempDiffVOF: float = 20*, *MinTempDiffVOF: float = 0.5*, *MultiplierVOF: float = 0.25*, *VSToffset: any = [0]*, *MinOToffset: any = [50]*, *MaxWindSpeed: any = [50]*, *ASTtol_start: float = 0.1*, *ASTtol_end_input: float = 0.1*, *ASTtol_steps: float = 0.1*, *NameSuffix: str = ''*, *verboseMode: bool = True*, *confirmGen: Optional[bool] = None*)

Bases: object

Adds the Adaptive-Comfort-Control Implementation Script, which is an EnergyManagementSystem script that applies adaptive setpoint temperatures to EnergyPlus building energy models.

Parameters

- **ScriptType** (*str*) – The default is None. 'vrf_ac' for VRF system with full air-conditioning mode, 'vrf_mm' for VRF system with mixed-mode, 'ex_ac' for existing HVAC only with full air-conditioning mode, 'ex_mm' for existing HVAC with mixed-mode.
- **SupplyAirTempInputMethod** (*str*) – The default is None. 'supply air temperature' or 'temperature difference' to use such supply air temperature input method in the VRF system. Only used if vrf_ac or vrf_mm are used.
- **Output_type** (*str*) – The default is None. Can be 'standard', 'simplified', 'detailed' or 'custom'.
- **Output_freqs** (*list*) – The default is None. A list containing the following strings: ['timestep', 'hourly', 'daily', 'monthly', 'runperiod']
- **Output_keep_existing** (*bool*) – The default is None. It is a boolean (True or False) to keep the existing Output:Variable objects or not.
- **Output_gen_dataframe** (*bool*) – The default is None. It is a boolean (True or False) to generate a pandas DataFrame instance containing all Output:Variable objects.
- **Output_take_dataframe** (*bool*) – It takes the pandas DataFrame previously generated with Output_gen_dataframe, which the user has filtered to keep only the rows related to the Output:Variable objects that need to be kept in the model.
- **EnergyPlus_version** (*str*) – The default is None. Can be '9.1', '9.2', '9.3', '9.4', '9.5', '9.6', '22.1', '22.2' or '23.1'.
- **TempCtrl** (*str*) – The default is None. Can be 'temp' or 'pmv'.

- **ComfStand** (*list*) – The default is None. ‘0 = ESP CTE; ‘1 = INT EN16798; ‘2 = INT ASHRAE55; ‘3 = JPN Rijal; ‘4 = CHN GBT50785 Cold; ‘5 = CHN GBT50785 HotMild; ‘6 = CHN Yang; ‘7 = IND IMAC C NV; ‘8 = IND IMAC C MM; ‘9 = IND IMAC R 7DRM; ‘10 = IND IMAC R 30DRM; ‘11 = IND Dhaka; ‘12 = ROM Udrea; ‘13 = AUS Williamson; ‘14 = AUS DeDear; ‘15 = BRA Rupp NV; ‘16 = BRA Rupp AC; ‘17 = MEX Oropeza Arid; ‘18 = MEX Oropeza DryTropic; ‘19 = MEX Oropeza Temperate; ‘20 = MEX Oropeza HumTropic; ‘21 = CHL Perez-Fargallo; ‘22 = INT ISO7730
- **CAT** (*list*) – The default is None. (1 = CAT I; 2 = CAT II; 3 = CAT III; 80 = 80% ACCEPT; 85 = 85% ACCEPT; 90 = 90% ACCEPT)
- **ComfMod** (*list*) – The default is None. (0/0.X = Static; 1/1.X = Adaptive when applicable, otherwise relevant local static model; 2 = Adaptive when applicable, otherwise relevant international static model 3 = Adaptive when applicable, otherwise horizontal extention of adaptive setpoints)
- **SetpointAcc** (*float*) – A float. It is the number for the accuracy of the setpoint temperatures. For instance, if 2 was used, setpoints would be rounded to every half Celsius degree; if 10 was used, the setpoints would be rounded to the first decimal.
- **CoolSeasonStart** (*any*) – A date in format dd/mm, or the number of the day in the year. Defines when start the cooling season, only used in some static setpoint temperatures.
- **CoolSeasonEnd** (*any*) – A date in format dd/mm, or the number of the day in the year. Defines when ends the cooling season, only used in some static setpoint temperatures.
- **HVACmode** (*list*) – The default is None. (0 = Fully Air-conditioned; 1 = Naturally ventilated; 2 = Mixed Mode)
- **VentCtrl** (*list*) – The default is None. (if HVACmode = 1: 0 = Ventilates above neutral temperature; 1 = Ventilates above upper comfort limit; if HVACmode = 2: 0 = Ventilates above neutral temperature and fully opens doors and windows; 1 = Ventilates above lower comfort limit and fully opens doors and windows; 2 = Ventilates above neutral temperature and opens doors and windows based on the customised venting opening factor; 3 = Ventilates above lower comfort limit and opens doors and windows based on the customised venting opening factor;)
- **MaxTempDiffVOF** (*float*) – The maximum temperature difference for the Venting Opening Factor. Must be a number greater than 0.
- **MinTempDiffVOF** (*float*) – The minimum temperature difference for the Venting Opening Factor. Must be a number greater than 0 and smaller than the maximum temperature difference.
- **MultiplierVOF** (*float*) – The multiplier for the modulation of the Venting Opening Factor. Must be a number between 0 and 1.
- **VSToffset** (*list*) – The default is 0. Please refer to documentation.
- **MinOToffset** (*list*) – The default is 50. Please refer to documentation.
- **MaxWindSpeed** (*list*) – The default is 50. Please refer to documentation.
- **ASTtol_start** (*float*) – The default is 0.1. Please refer to documentation.
- **ASTtol_end_input** (*float*) – The default is 0.1. Please refer to documentation.
- **ASTtol_steps** (*float*) – The default is 0.1. Please refer to documentation.
- **NameSuffix** (*str*) – The default is ‘’ (an empty string). Please refer to documentation.
- **verboseMode** (*bool*) – True to print the process on screen. Default is True.

- **confirmGen** (*bool*) – True to skip confirmation of output IDF generation. Default is None.

Variables

- **arguments** – A dictionary containing all arguments
- **df_outputs** – the pandas DataFrame instance created with argument `Output_gen_dataframe`
- **input_idfs** – A dictionary containing all input IDFs following the format {'input idf filename': class `eppy.modeleditor.IDF object`}
- **occupied_zones** – A dictionary containing all input idfs and occupied zone names following the format {'idf filename': [list of zone names]}
- **occupied_zones_original_name** – A dictionary containing all input idfs and occupied zone original names following the format {'idf filename': [list of zone original names]}
- **output_idfs** – A dictionary containing all output IDFs following the format {'output idf filename': class `eppy.modeleditor.IDF object`}
- **windows_and_doors** – A dictionary containing all input idfs and window and door names following the format {'idf filename': [list of window and door names]}
- **windows_and_doors_original_name** – A dictionary containing all input idfs and window and door original names following the format {'idf filename': [list of window and door original names]}

13.1.1.3.11 Module contents

13.1.2 Module contents

CHAPTER

FOURTEEN

DOCUMENTATION FOR PREVIOUS VERSIONS

You can download the documentation in pdf for previous versions of accim below:

- View 0.6.12.

CHAPTER

FIFTEEN

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PYTHON MODULE INDEX

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