**Chm.json nodes utilized by ShaidyRMapGen**

**For General Map information:**

1. **name** [required] - A text value for name of the heat map.
2. **attributes** [optional] – An array of paired values containing attributes for the map (default empty array)

**For Data Layers (node layers) [required]:**

1. **name** [required] – A text value for name of the data layer.
2. **summary\_method** [optional]: A text value for the type of summarization done for thumbnail , summary, and ribbon views by the NgChm Builder. Valid values: “average” (default), “mode”, “sample “
3. **data** [required] – A JSON parent node that must contain the sub-node “value”.
   1. **value** [required] - Contains a path to the dataset for the data layer.
4. **renderer** [required] – An integer value that maps the data layer to a renderer node in the chm.json file.
5. **grid\_color** [optional] – A string value containing the hex color code for the appearance of the grid on the detail panel in the viewer.
6. **grid\_show** [optional] – A string (“Y”/”N”) value indicating whether or not to show the grid on the detail panel in the viewer.
7. **selection\_color** [optional] - A string value containing the hex color code for the appearance of the selection box displayed on the summary and detail panels of the viewer.
8. **cuts\_color** [optional]– A string value containing the hex color code for the appearance of gaps that appear in the summary and detail panels of the viewer.

**For Rows & Columns (node “row\_data”/”column\_data”) [required]**

1. **order\_method** [required] – A text entry containing the ordering method for rows/cols (“user” is converted to “hierarchical”)
2. **labels** [required] – Labels JSON parent node containing the following entries:
   1. **value** [required] – A text entry containing the directory for the labels file (no default). This is only used when the order method is NOT “Hierarchical” to generate labels.
   2. **label\_display\_length** [optional] – A single integer value in quotes (default “20”)
   3. **label\_display\_abbreviation** [optional] – A string value for the abbreviation type (default “END”)
   4. **label\_extra\_metadata** [optional] – JSON node that contains the sub-node “value” containing a different directory for the labels file than the labels->value node. This directory will need to contain the file labels.txt. Values in this file will be matched to rows in the original labels file to add extended meta data to those labels. (no default)
3. **distance\_metric** [optional] – A text entry containing the value for the distance metric used for hierarchically ordered rows/cols. Required when order\_method is “user” (hierarchical).
4. **agglomeration\_method** [optional] - A text entry containing the value for the agglomeration method used for hierarchically ordered rows/cols. Required when order\_method is “user” (hierarchical).
5. **cut\_locations** [optional] – A comma separated integer array of row column positions (no default)
6. **cut\_width** [optional] – An integer value containing the number of row/cols wide that cuts will be (default 2 if cut locations provided)
7. **top\_items** [optional] – A comma separated array of string values containing label values (no default)
8. **tree\_cuts** [optional] – A single integer value in quotes. Cuts are usually supplied from R via cut\_locations but this parameter will call on the NgChm builder to generate the specified number of row/column cuts using dendrogram data. (no default)
9. **dendrogram** [required] – Labels JSON parent node containing the following entries:
   1. **value** [required] – Contains a path to the dataset for the dendrogram. The builder will look for the *dendrogram-data.tsv* and *dendrogram-order.tsv* files in this directory.
10. **dendro\_show** [optional] – A string containing one of 4 potential values (“NA”,”NONE”, “SUMMARY”, and “ALL”). NA for maps with no clustering (this is the default in the builder when none are supplied, so it is unnecessary in chm.json); NONE to preclude the display of dendrograms on both the summary and detail panels in the viewer; SUMMARY to show dendros on the summary panel only; and ALL for showing dendros on both panels.
11. **dendro\_height** [optional] – A string containing an integer value to be used for the display height of the row/column dendrogram on the summary and detail viewer panels.

**Covariates (node “covariates”) [optional]:**

1. **label** [required] – A single text value describing the covariate bar
2. **type** [required] – A single text value describing the color type for the covariate bar (“discrete” or “continuous”)
3. **data** [required] – A JSON node that must contain the sub-node “value”.
   1. **value** [required] **-** This sub-node contains a path to the dataset for the covariate bar.
4. **thickness** [optional] – A single integer value, in quotes, for the height of the covariate bar (default “15”)
5. **display** [optional] – A single text value indicating whether to show the covariate bar initially in the viewer. (default “visible” converted to Y/N for NgChm builder).
6. **renderer** [required] – An integer value that maps the covariate to a *covariate\_renderer* node in the chm.json file for retrieving color map configurations for the bar.
7. **bar\_type** [optional] – A single text value indicating the type of covariate bar (e.g “bar\_plot“,“color\_plot“, “scatter\_plot“)
8. **fg\_color** [optional] – A single text value indicating the foreground color of the covariate bar.
9. **bg\_color** [optional] – A single text value indicating the background color of the covariate bar.
10. **low\_bound** [optional] – A single text value containing an integer for the lower bound of the covariate bar.
11. **high\_bound** [optional] – A single text value containing an integer for the upper bound of the covariate bar.
12. **data\_type** [optional] – A single text value to be used by linkouts in the viewer.
13. **tree\_cuts** [optional] – A text value containing an integer for the number of dendrogram cuts to be generated in a tree cut covariate bar.

**Color Maps (node “renderer” for data layers and “covariate\_renderer” for covariate bars [required]**

1. **type** [required] – A text value in quotes (e.g. “linear”,”continuous”,”quantile”,”discrete”)
2. **missing** [required for data layers] - A text value in quotes containing color for missing values
3. **points** [required] – An array of color map sub-node values
4. **value** [required] – A text value in quotes containing the threshold for data layers and the covariate value for covariate bars.
5. **color** [required] - A text value in quotes containing the color for data layers and covariate bars.

Mapping of chm.json nodes to heatmapProperties.json nodes:

**For General Map information:**

name chm\_name

attributes chm\_attributes

**For Data Layers (node layers) [required]:**

layers matrix\_files

name name

summary\_method summary\_method

data->value path

**For Rows & Columns (node “row\_data”/”column\_data”) [required]**

order\_method order\_method

distance\_metric distance\_metric

agglomeration\_method agglomeration\_method

dendrogram->value dendro\_file

dendrogram->value order\_file

label\_display\_length label\_display\_length

label\_display\_abbreviation label\_display\_abbreviation

label\_extra\_metadata label\_extra\_file

cut\_locations cut\_locations

cut\_width cut\_width

top\_items top\_items

tree\_cuts tree\_cuts

**Covariates (node “covariates”) [optional]:**

covariates classification\_files

label name

data path

thickness height

display show

renderer color\_map

bar\_type bar\_type

fg\_color fg\_color

bg\_color bg\_color

low\_bound low\_bound

high\_bound high\_bound

**Color Maps (node “renderer” for data layers and “covariate\_renderer” for covariate bars [required]**

points color\_map

type type

missing missing

value thesholds

color colors