**Scatter plot: To compare observed and simulated data**

x and y axis are chosen depending on the headers of the csv files. For example, the csv has 3 headers as ‘timeStamp’, ‘value’, ‘clone’, the options for xaxis and yaxis should be just ‘value’ and ‘clone’ as this is the scatter plot for comparison.

**xaxis – string**: Choose x axis

**xlabel – string**: Input x axis label

**yaxis – string**: Choose y axis

**ylabel – string**: Input y axis label

**title – string**: Input plots's title

**trendline – string**: Do you want to plot the trendline? Choose Yes or No

**name – string**: Ask for the name of the export file

**filetype – string**: Ask for file format (3 options: jpg, png, svg)

**dpi – integer**: Ask for dpi of the export file (User could input any number, but show a line like ‘Recommended dpi values: 300, 600, 1200.’)

**Time Series**

The function could show only one or both observed and simulated data in a time series.

Also, export a new csv file with new columns of different formats in time.

x and y axis are chosen depending on the headers of the csv files.

**time – string**: Choose x axis (Depending on the choice of the user, the x axis will be displayed in a different format)

if time == 'Datetime':

**Xaxisformat – string**: Choose x axis format

**xlabel – string**: Input x axis label

**obdata – string**: Choose y data for observation

**simdata – string**: Choose y data for simulation

**asksim – string**: Do you want to display simulated data also (Yes/No)

**ylabel – string**: Input y axis label

**title – string**: Input graph title

**Plot multi data:**

**For observe data**

**multi – string:** Do you want to plot more observed data (Yes/No)

In Python code, Headers of the data will be printed for users to choose which data to plot

**addline – string:** Choose which data to be plotted

**addlinelabel – string:** Input data label

**For simulated data**

**multiSI – string:** Do you want to plot more observed data (Yes/No)

In Python code, Headers of the data will be printed for users to choose which data to plot

**addlineSI – string:** Choose which data to be plotted

**addlinelabelSI – string:** Input data label

print("Possible legend locations: best, upper left, upper right, lower left, lower right, right, center left, center right, lower center, upper center, center. ")

**leglocation – string**: Choose legend location (depends on the above keywords)

**legsize** **– integer:** Adjust legend box's size

**grid – string**: 'With or without grid (True/False)

**name – string**: Ask for the name of the export file

**filetype – string**: Ask for file format (3 options: jpg, png, svg)

**dpi – integer**: Ask for dpi of the export file (User could input any number, but show a line like ‘Recommended dpi values: 300, 600, 1200.’)

**3D visualization**

These values could be retrieved from grid coordinates

**xmin – float**: Insert xmin:

**xmax – float**: Insert xmax:

**ymax – float**: Insert ymin:

**ymin – float**: Insert ymax:

**c – integer**: Insert a number to edit scale bar levels: (The resolution of the map depends on this parameter, the higher the value could lead to better resolution)

**clblabel – string**: Insert z axis label:

**cmap – string** (specific keywords): Choose map color:

Color keywords (optional): 'Accent', 'Accent\_r', 'Blues', 'Blues\_r', 'BrBG', 'BrBG\_r', 'BuGn', 'BuGn\_r', 'BuPu', 'BuPu\_r', 'CMRmap', 'CMRmap\_r', 'Dark2', 'Dark2\_r', 'GnBu', 'GnBu\_r', 'Greens', 'Greens\_r', 'Greys', 'Greys\_r', 'OrRd', 'OrRd\_r', 'Oranges', 'Oranges\_r', 'PRGn', 'PRGn\_r', 'Paired', 'Paired\_r', 'Pastel1', 'Pastel1\_r', 'Pastel2', 'Pastel2\_r', 'PiYG', 'PiYG\_r', 'PuBu', 'PuBuGn', 'PuBuGn\_r', 'PuBu\_r', 'PuOr', 'PuOr\_r', 'PuRd', 'PuRd\_r', 'Purples', 'Purples\_r', 'RdBu', 'RdBu\_r', 'RdGy', 'RdGy\_r', 'RdPu', 'RdPu\_r', 'RdYlBu', 'RdYlBu\_r', 'RdYlGn', 'RdYlGn\_r', 'Reds', 'Reds\_r', 'Set1', 'Set1\_r', 'Set2', 'Set2\_r', 'Set3', 'Set3\_r', 'Spectral', 'Spectral\_r', 'Wistia', 'Wistia\_r', 'YlGn', 'YlGnBu', 'YlGnBu\_r', 'YlGn\_r', 'YlOrBr', 'YlOrBr\_r', 'YlOrRd', 'YlOrRd\_r', 'afmhot', 'afmhot\_r', 'autumn', 'autumn\_r', 'binary', 'binary\_r', 'bone', 'bone\_r', 'brg', 'brg\_r', 'bwr', 'bwr\_r', 'cividis', 'cividis\_r', 'cool', 'cool\_r', 'coolwarm', 'coolwarm\_r', 'copper', 'copper\_r', 'cubehelix', 'cubehelix\_r', 'flag', 'flag\_r', 'gist\_earth', 'gist\_earth\_r', 'gist\_gray', 'gist\_gray\_r', 'gist\_heat', 'gist\_heat\_r', 'gist\_ncar', 'gist\_ncar\_r', 'gist\_rainbow', 'gist\_rainbow\_r', 'gist\_stern', 'gist\_stern\_r', 'gist\_yarg', 'gist\_yarg\_r', 'gnuplot', 'gnuplot2', 'gnuplot2\_r', 'gnuplot\_r', 'gray', 'gray\_r', 'hot', 'hot\_r', 'hsv', 'hsv\_r', 'inferno', 'inferno\_r', 'jet', 'jet\_r', 'magma', 'magma\_r', 'nipy\_spectral', 'nipy\_spectral\_r', 'ocean', 'ocean\_r', 'pink', 'pink\_r', 'plasma', 'plasma\_r', 'prism', 'prism\_r', 'rainbow', 'rainbow\_r', 'seismic', 'seismic\_r', 'spring', 'spring\_r', 'summer', 'summer\_r', 'tab10', 'tab10\_r', 'tab20', 'tab20\_r', 'tab20b', 'tab20b\_r', 'tab20c', 'tab20c\_r', 'terrain', 'terrain\_r', 'turbo', 'turbo\_r', 'twilight', 'twilight\_r', 'twilight\_shifted', 'twilight\_shifted\_r', 'viridis', 'viridis\_r', 'winter', 'winter\_r'

**aspect – integer**: Changing aspect (from 0 – 360)

**cbarlabel – string**: Change scale bar label

**name – string**: Ask for the name of the export file

**filetype – string**: Ask for file format (3 options: jpg, png, svg)

**dpi – integer**: Ask for dpi of the export file (User could input any number, but show a line like ‘Recommended dpi values: 300, 600, 1200.’)

**axislabelsize – integer**: Axis text size:

**ticklabelsize – integer**: Tick text size:

**scalebarsize – integer**: Scale bar text size:

**Contour map**

These values could be retrieved from grid coordinates

**xmin – float**: Insert xmin:

**xmax – float**: Insert xmax:

**ymax – float**: Insert ymin:

**ymin – float**: Insert ymax:

**c – integer**: Insert a number to edit scale bar levels: (The resolution of the map depends on this parameter, the higher the value could lead to better resolution)

**name – string**: Ask for the name of the export file

**filetype – string**: Ask for file format (3 options: jpg, png, svg)

**dpi – integer**: Ask for dpi of the export file (User could input any number, but show a line like ‘Recommended dpi values: 300, 600, 1200.’)

**clblabel – string**: Change scale bar label

**rotation – integer**: Adjust label orientation

**distance – integer**: Adjust label distance from the scale bar

**cmap – string** (specific keywords): Choose map color:

Color keywords (optional): 'Accent', 'Accent\_r', 'Blues', 'Blues\_r', 'BrBG', 'BrBG\_r', 'BuGn', 'BuGn\_r', 'BuPu', 'BuPu\_r', 'CMRmap', 'CMRmap\_r', 'Dark2', 'Dark2\_r', 'GnBu', 'GnBu\_r', 'Greens', 'Greens\_r', 'Greys', 'Greys\_r', 'OrRd', 'OrRd\_r', 'Oranges', 'Oranges\_r', 'PRGn', 'PRGn\_r', 'Paired', 'Paired\_r', 'Pastel1', 'Pastel1\_r', 'Pastel2', 'Pastel2\_r', 'PiYG', 'PiYG\_r', 'PuBu', 'PuBuGn', 'PuBuGn\_r', 'PuBu\_r', 'PuOr', 'PuOr\_r', 'PuRd', 'PuRd\_r', 'Purples', 'Purples\_r', 'RdBu', 'RdBu\_r', 'RdGy', 'RdGy\_r', 'RdPu', 'RdPu\_r', 'RdYlBu', 'RdYlBu\_r', 'RdYlGn', 'RdYlGn\_r', 'Reds', 'Reds\_r', 'Set1', 'Set1\_r', 'Set2', 'Set2\_r', 'Set3', 'Set3\_r', 'Spectral', 'Spectral\_r', 'Wistia', 'Wistia\_r', 'YlGn', 'YlGnBu', 'YlGnBu\_r', 'YlGn\_r', 'YlOrBr', 'YlOrBr\_r', 'YlOrRd', 'YlOrRd\_r', 'afmhot', 'afmhot\_r', 'autumn', 'autumn\_r', 'binary', 'binary\_r', 'bone', 'bone\_r', 'brg', 'brg\_r', 'bwr', 'bwr\_r', 'cividis', 'cividis\_r', 'cool', 'cool\_r', 'coolwarm', 'coolwarm\_r', 'copper', 'copper\_r', 'cubehelix', 'cubehelix\_r', 'flag', 'flag\_r', 'gist\_earth', 'gist\_earth\_r', 'gist\_gray', 'gist\_gray\_r', 'gist\_heat', 'gist\_heat\_r', 'gist\_ncar', 'gist\_ncar\_r', 'gist\_rainbow', 'gist\_rainbow\_r', 'gist\_stern', 'gist\_stern\_r', 'gist\_yarg', 'gist\_yarg\_r', 'gnuplot', 'gnuplot2', 'gnuplot2\_r', 'gnuplot\_r', 'gray', 'gray\_r', 'hot', 'hot\_r', 'hsv', 'hsv\_r', 'inferno', 'inferno\_r', 'jet', 'jet\_r', 'magma', 'magma\_r', 'nipy\_spectral', 'nipy\_spectral\_r', 'ocean', 'ocean\_r', 'pink', 'pink\_r', 'plasma', 'plasma\_r', 'prism', 'prism\_r', 'rainbow', 'rainbow\_r', 'seismic', 'seismic\_r', 'spring', 'spring\_r', 'summer', 'summer\_r', 'tab10', 'tab10\_r', 'tab20', 'tab20\_r', 'tab20b', 'tab20b\_r', 'tab20c', 'tab20c\_r', 'terrain', 'terrain\_r', 'turbo', 'turbo\_r', 'twilight', 'twilight\_r', 'twilight\_shifted', 'twilight\_shifted\_r', 'viridis', 'viridis\_r', 'winter', 'winter\_r'

**ask – string:** Do you want to export an raster (Choose Yes/No)

if ask == 'Yes':

tifname – string: Input export file name