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Function: main ()

1. As required, prompt the user to input the file name, metric and the action.
2. Check whether the file exists or not. If the input file does not exist, return None
3. Call the function (Normalize) to get the normalized data.
4. Use the structure of if… elif… else… to choose the action
   - If action is list, then call the functions to get min, mean, median and harmonic mean
     a) Min function
     b) Mean function
     c) Median function
     d) Harmonic function
   - If action is correlation, call the function to get the correlation.
   - If the action is not list or correlation, then ask user to try again and return None.

Function: Normalize (file_name)

1. Open the file and use a loop to store all the data in a list. What is inside the list are the lists containing the data of every row.
2. Use a nested loop to delete the "\n" in the last element of every row (by using strip ()), transfer "" to None, and change the type of data (which is string) to the float number.
3. Use another nested loop to normalize the number
   - Set a new list to store the data of each column by using loop
   - Use max () and min () function to find the largest and smallest number of each column
   - And then use (score – min) / (max – min) to get all the normalized number
4. Close the file finally and return the list containing normalized results.

Function: Mean (list)

1. Set an empty list, a variable to store the sun of the data and a variable counting the number of variables
2. Use a nested loop to get every element of the row and avoid the None variable, sum them up and count their number. Get the mean of every row through dividing
3. Append them in the list, and use bubble sort to sort by size, finally return the list

Function: Harmonic_mean (list)

The general steps of harmonic function are similar with the mean function.

Some difference:

1. Sum the inverse of every elements of the row and then use the count to divided by sum

$$Harmonic\ mean = \frac{count}{\sum 1/element}$$

2. Avoid the None and any zeroes.


Function: Min (list)

1. Use a nested loop (to get rid of the None) to get the elements of every rows, set a list to store them
2. And then use the min function to get the minimum.
3. Use bubble sort to print it.


Function: Median(list)

1. For each row, use a new list to store the value (avoid the None)
2. We get 2 conditions of the result (the length of the list is odd or even)
3. Use bubble sort (we need a descending list)


Function: Correlation(list)

1. Rank the life ladder and the mean metric every row and store in 2 lists
2. Use the simple form of Spearman calculation to get the correlation.

$$correlation = 1 - \frac{6\sum d ** 2}{n * (n ** 2 - 1)}$$