

## Assignment 4

This assignment is **individual** effort.

### Problem Definition:

Let's say we have two users, User P and User Q, and they have rated 7 different cell phone brands on a scale of 1 to 10.

Item	Ratings of User P	Ratings of User Q
Apple	1	7
Samsung	5	1
Nokia	7	4
Motorola	8	-
LG	5	4
Sony	1	6
Blackberry	7	3

In Python, we can depict these ratings as two dictionaries:

**UserPRatings** = {'Apple':1, 'Samsung':5, 'Nokia':7, 'Motorola':8, 'LG':5, 'Sony':1, 'Blackberry':7}

**UserQRatings** = {'Apple':7, 'Samsung':1, 'Nokia':4, 'LG':4, 'Sony':6, 'Blackberry':3}

We would like to find the Pearson Correlation between these two dictionaries.

### Requirement for this Assignment:

You have been provided with a framework for this assignment: "Assignment 4 – Framework.py". This assignment requires you to code and call the Person Correlation function in the framework as follows.

#### **Steps 1 through 7**

The **pearsonD** function takes two dictionary parameters - user1ratings and user2ratings - and returns the Pearson Correlation between the two user ratings. You must not pass any additional parameters to the function.

- Code the **pearsonD** function to use a single for loop to calculate the Pearson Correlation using the computationally efficient form (similar to Slides 16 and 17 of Exercise Set 3... but using dictionaries instead of lists).
- Note: Your code should ensure that the Pearson Correlation calculation considers an item only if it was rated by both users (similar to how we handled this for Minkowski on Slides 14 and 15 of Exercise Set 4... while also ensuring that the value of  $n$  in the pearson correlation formula only counts the number of items rated by both users). Also, your code should be generic enough to work for any two sets of ratings – do not hard code anything that might be specific to the rating patterns in the data for User P and User Q.

### **Steps 8 through 9:**

Then call the ***pearsonD*** function for UserPRatings and UserQRatings defined above, and print the pearson correlation value.

Some things to keep in mind as you code:

- Make your code readable – for instance, use meaningful variable names and comments.
- Make your code elegant – for instance, balance the number of variables you introduce – too many or too few make your code difficult to debug, read, and maintain.
- Make your output readable and user-friendly

### Submission:

Once you have written up the script, save it as follows: <FirstName><LastName>Assignment4.py.

*[Example: HinaAroraAssignment4.py]*

Submit the script by uploading the above python script. Note: upload the actual script – DO NOT attach a screenshot of the script!

Once you have made your submission, you can check the posted solution for this assignment in the next module, and self-grade your submission.

### Hint:

If you have coded up this assignment correctly, you should end up with a Pearson Correlation of -0.7307.