

In-Class Exercise 5

Directions

1. Get into your regular team
2. Discuss and complete the assignment **together**. Don't just assign different problems to each teammate! That defeats the purpose of team-based learning.
3. Choose a recorder to prepare the final copy to submit to instructor in Blackboard. **Only one person needs to submit** on behalf of the team. When finished, save your work and then from the **File** menu, choose **Download as** then **Notebook (.ipynb)**. Include your Team Color in your new filename (as in **ICE5-RED.ipynb**). You will upload this Jupyter Notebook file as your submission.
4. When you are done with your Notebook, from the **File** menu, choose **Close and Halt**.
5. From the Dashboard, click the **Quit** button to exit Jupyter.

Due: Friday, September 21 by 11:59 PM

Names of team members: Diane Nguyen, Brian Merkle, Alec Risch, Taylor Eckert, Michael Rayome

Problem 1

Write a Python code fragment in the code cell below that defines a function that takes a string as a parameter and returns the number of spaces in the string. This function must use a **while** loop. Test your function with at least two strings. (7 pts.)

```
In [13]: def countStr(string, char):
          count = 0

          while count <= len(string):
              for char in string:
                  if char == " ":
                      count = count + 1
              return count

          teststring1= "Count this, application."
          teststring2= "Also count this, please    . space "

          print(countStr(teststring1, " "))
          print(countStr(teststring2, " "))
```

2
10

Problem 2

Write a Python code fragment in the code cell below that defines a **recursive function** to compute the sum of all the numbers in a list. Test your function with an empty list (`[]`) and a list that has several numbers (like `[5, 10, 15]`). (10 pts.)

Hint: If the list is empty, the total will be zero (your base case). Otherwise, the total will be the first number in the list + the sum of the rest of the list (your recursive step). Remember, you can slice a list from the second item to the last by `aList[1:]` easily.

```
In [15]: def sumlist(ourlist):
          if len(ourlist) == 0:
              return 0
          else:
              return ourlist[0] + sumlist(ourlist[1:])

          ourtestlist1 = [5, 10, 15]
          ourtestlist0 = []

          print (sumlist(ourtestlist1))
          print(sumlist(ourtestlist0))
```

30
0

Problem 3

In the Markdown cell below, briefly explain what is meant by the term *Cluster Analysis*. Your answer need only be 2-3 sentences long. (8 pts.)

Cluster Analysis is a technique in data mining where you divide data into meaningful groups called "clusters." These clusters are groups of similar data values that are distinctly dissimilar from values outside of their cluster.