Assignment - 3

Topic: String manipulation

1. Reduce a string of lowercase characters in range ascii ['a'..'z'] by doing a series of operations. In each operation, select a pair of adjacent letters that match, and delete them. Delete as many characters as possible using this method and return the resulting string. If the final string is empty, return Empty String.

a.   Input- aaabccddd, output- abd, input- abba output-empty string.

2. Write a Python function that accepts a string and calculates the number of uppercase letters and lowercase letters.

3. Write a Python function to check whether a string is a pangram or not.
Note : Pangrams are words or sentences containing every letter of the alphabet at least once.
  For example : "The quick brown fox jumps over the lazy dog".

4. Write a program to check whether a user input string is palindrome or not.

5. In the Byteland country, a string S is said to super ASCII string if and only if the count of each character in the string is equal to its ASCII value. In the Byteland country ASCII code of 'a' is 1, 'b' is 2, …, 'z' is 26. The task is to find out whether the given string is a super ASCII string or not. If true, then print "Yes" otherwise print "No".

6. The Caesar cipher is a type of substitution cipher in which each alphabet in the plaintext or messages is shifted by a number of places down the alphabet.
For example,with a shift of 1, P would be replaced by Q, Q would become R, and so on.
To pass an encrypted message from one person to another, it is first necessary that both parties have the 'Key' for the cipher, so that the sender may encrypt and the receiver may decrypt it.
Key is the number of OFFSET to shift the cipher alphabet. Key can have basic shifts from 1 to 25 positions as there are 26 total alphabets.
As we are designing a custom Caesar Cipher, in addition to alphabets, we are considering numeric digits from 0 to 9. Digits can also be shifted by key places.
For Example, if a given plain text contains any digit with values 5 and keyy =2, then 5 will be replaced by 7, "-"(minus sign) will remain as it is. Key value less than 0 should result into "INVALID INPUT"

Example 1:

Enter your PlainText: All the best

Enter the Key: 1

The encrypted Text is: Bmm uif Cftu

Write a function CustomCaesarCipher(int key, String message) which will accept plaintext and key as input parameters and returns its cipher text as output.

7. A City Bus is a Ring Route Bus which runs in circular fashion.That is, Bus once starts at the Source Bus Stop, halts at each Bus Stop in its Route and at the end it reaches the Source Bus Stop again.

If there are n number of Stops and if the bus starts at Bus Stop 1, then after nth Bus Stop, the next stop in the Route will be Bus Stop number 1 always.

If there are n stops, there will be n paths.One path connects two stops. Distances (in meters) for all paths in Ring Route is given in array Path[] as given below:

Path = [800, 600, 750, 900, 1400, 1200, 1100, 1500]

Fare is determined based on the distance covered from source to destination stop as Distance between Input Source and Destination Stops can be measured by looking at values in array Path[] and fare can be calculated as per following criteria:

- If d =1000 metres, then fare=5 INR
- (When calculating fare for others, the calculated fare containing any fraction value should be ceiled. For example, for distance 900n when fare initially calculated is 4.5 which must be ceiled to 5)

Path is circular in function. Value at each index indicates distance till current stop from the previous one. And each index position can be mapped with values at same index in BusStops [] array, which is a string array holding abbreviation of names for all stops as-

"THANERAILWAYSTN" = "TH", "GAONDEVI" = "GA", "ICEFACTROY" = "IC", "HARINIWASCIRCLE" = "HA", "TEENHATHNAKA" = "TE", "LUISWADI" = "LU", "NITINCOMPANYJUNCTION" = "NI", "CADBURRYJUNCTION" = "CA"

Given, n=8, where n is number of total BusStops.

BusStops = ["TH", "GA", "IC", "HA", "TE", "LU", "NI","CA"]

Write a code with function getFare(String Source, String Destination) which take Input as source and destination stops(in the format containing first two characters of the Name of the Bus Stop) and calculate and return travel fare.

Example 1:

Input Values

ca

Ca

Output Values

INVALID OUTPUT

Example 2:

Input Values

NI

HA

Output Values

23.0 INR

Note: Input and Output should be in format given in example.

Input should not be case sensitive and output should be in the format   INR