OPEN SOURCE SOFTWARE LAB (15B17CI575)

Lab Assignment 3 (Practice Lab)

Topic Coverage: Python

1. Write a function *invertdict* to interchange keys and values in a dictionary. For simplicity, assume that all values are unique.

2. Write a function *valuesort* to sort values of a dictionary based on the key.

3. Write a python program to find N largest elements assuming size of list is greater than or equal to N.

4. Write a Python program to get all possible two digit letter combinations from a digit (1 to 9) string.
   string_maps = {
   "1": "abc",
   "2": "def",
   "3": "ghi",
   "4": "jkl",
   "5": "mno",
   "6": "pqrs",
   "7": "tuv",
   "8": "wxy",
   "9": "z"
   }

5. There are 10 vertical and horizontal squares on a plane. Each square is painted blue and green. Blue represents the sea, and green represents the land. When two green squares are in contact with the top and bottom, or right and left, they are said to be ground. The area created by only one green square is called "island". Write a Python program to read the mass data and find the number of islands.
   Input:
   A single data set is represented by 10 rows of 10 numbers representing green squares as 1 and blue squares as zeros.

1100000111
1000000111
0000000111
0010001000
0000011100
0000111110
0001111111
1000111110
1100011100
1110001000
Number of islands:
5

6. Write a python program to read from input a string. The input contains COMMA separated integers. The string can also contain spaces before and after COMMA. The output of the program is a list of integers that contains the DOUBLE of all numbers in the input.
   NOTE:
   - The output value is computed as a list of integers.
   - Use Python's print(...) to print it directly.
   - Negative integers and ZERO are allowed in the input.
   - Use python's split(...) function to process the input string.

   Input:
   123, 456, 222, 145
   Output:
   [246, 912, 444, 290]
   Input:
   -1, 0, -2, 2, 0, 1
   Output:
   [-2, 0, -4, 4, 0, 2]

7. Write a Python program to extract characters from various text files and put them into a list.

8. **Vending Machine**
   In this program, you have to simulate a simple Vending Machine. You need to read a file, VendingItems.txt. It should contain Item-names and their Prices (integers) separated by a PIPE (|). Here is a sample:
   Potato Chips|20
   Popcorn|30

Chocolate|15
Biscuit|10
Soft Drink|12
Store the lines read in a dictionary, mapping items to their respective prices.
The input to the program will consist of an item name. If the item is not a valid item (i.e., an item not available in the vending machine), you need to ask the user to try again. Use exceptions to handle the missing items.
After a proper item is read, the program expects the user to provide the money to deposit in the vending machine (integer). Again, the program will ask the user to try again till a proper integer is read (using exception handling).
Finally, depending upon the money deposited by the user, the Machine will display the appropriate message(s).
EXAMPLE INTERACTION (INPUT and OUTPUT are intermixed. INPUTs are shaded):
batata vada
Available Items are ['Potato Chips', 'Popcorn', 'Chocolate', 'Biscuit', 'Soft Drink'].
Try Again.
pani-puri
Available Items are ['Potato Chips', 'Popcorn', 'Chocolate', 'Biscuit', 'Soft Drink'].
Try Again.
Potato Chips
credit-card
Bad Input credit-card.
Try Again.
debit-card
Bad Input debit-card.
Try Again.
25
Thank you for your purchase. Enjoy
Do not forget to collect your change, 5 Rs.