# Practice Set-2

**Total No of Questions:** 22

**Q1. Given a Tuple, find the frequency of each element.**

**Input1 :** test_tup = (4, 5, 4, 5, 6, 6, 5)
**Output 1:** {4: 2, 5: 3, 6: 2}
**Explanation :** Frequency of 4 is 2 and so on..
**Input2 :** test_tup = (4, 5, 4, 5, 6, 6, 6)
**Output2 :** {4: 2, 5: 2, 6: 3}
**Explanation :** Frequency of 4 is 2 and so on..

**Reference link:**
https://www.geeksforgeeks.org/python-elements-frequency-in-tuple/

**Q2. Given a dictionary with values list, extract the key whose value has the most unique values.**

**Example:**
Input1 : test_dict = {“Gfg” : [5, 7, 9, 4, 0], “is” : [6, 7, 4, 3, 3], “Best” : [9, 9, 6, 5, 5]}

Output1 : “Gfg”

**Explanation :** “Gfg” having max unique elements i.e 5.

Input 2 : test_dict = {“Gfg” : [5, 7, 7, 7, 7], “is” : [6, 7, 7, 7], “Best” : [9, 9, 6, 5, 5]}

Output 2 : “Best”

**Explanation :** 3 (max) unique elements, 9, 6, 5 of “Best”.

**Reference link:**
https://www.geeksforgeeks.org/python-key-with-maximum-unique-values/

**Q3.Given a list of tuple extract tuple that have k digit elements**

**Input1**- [(54, 2), (34, 55), (222, 23), (12, 45), (782, )] k=3

**Output1**-[ (782,)]

**Explanation**- Only one tuple have numbers having digits=3

**Reference Link:**

https://www.geeksforgeeks.org/python-extract-tuples-having-k-digit-elements/

**Q4. Find all keys in a nested dictionary and return a list having keys in sorted order.**

**Example** - {1:0, 2:{1:3, 4:6}, 5:6, 9:{1:{3:4}}}

**Output** - [1,1,1,2,3,4,5,9]

(The depth of nested dictionary is not limited to any specific number, try to write a generic code)

**Q5. Given a list and dictionary, map each element of list with each item of dictionary, forming nested dictionary as value.**

**Input 1:** test_dict = {'Gfg' : 4, 'best' : 9}, test_list = [8, 2]

**Output 1:** {8: {'Gfg': 4}, 2: {'best': 9}}

**Explanation :** Index-wise key-value pairing from list [8] to dict {'Gfg' : 4} and so on.

**Input 2:** test_dict = {'Gfg' : 4}, test_list = [8]

**Output 2:** {8: {'Gfg': 4}}

**Explanation :** Index-wise key-value pairing from list [8] to dict {'Gfg' : 4}.

**Reference Link:**
https://www.geeksforgeeks.org/python-create-nested-dictionary-using-given-list/amp/

**Q6. Given a heterogeneous values of dictionary, filter key-value pair of dictionary items having value greater than some specified constant say K(if in case of integer value), otherwise include as it.**

Input: {'Gfg': 4, 'for': 'geeks', 'is': 2, 'best': 3}
Output: {'Gfg': 4, 'for': 'geeks'}

**Explanation:** Input is a mixture of key-value pairs(key is string, and value can string or integer), output is a set of key-value pairs which have integer value greater than K. Here let K=3, then {'Gfg': 4 } is selected as 4>3, and {'for': 'geeks' } is selected as we do not have to consider the string value 'geeks'.

**Reference Link:**
https://www.geeksforgeeks.org/python-filter-dictionary-values-in-heterogeneous-dictionary/?ref=leftbar-rightbar

**Q7. Given a two list(one of string and other of characters), identify the string from the string list whose all characters are involved from character list only.**

**Input :** Dict = ["go","bat","me","eat","goal","boy", "run"]
arr = ['e','o','b', 'a','m','g', 'l']
**Output :** go, me, goal.

**Explanation:** all characters of "go", "me" and "goal" string are present in arr list.

**Reference Link:**

https://www.geeksforgeeks.org/possible-words-using-given-characters-python/

**Q8. Check if two sets have any elements in common. If yes, display the common elements.**

**Input:**

set1 = {10, 20, 30, 40, 50}

set2 = {60, 70, 80, 90, 10}

**Output:**

Two sets have items in common

{10}

**Hint:**

Use the isdisjoint() and intersection()

**Reference Link:**

https://pynative.com/python-set-exercise-with-solutions/#h-exercise-7-check-if-two-sets-have-any-elements-in-common-if-yes-display-the-common-elements

**Q9. Given a set, write a Python program to generate all possible subset of size n of given set within a list.**

**Input:**

{1, 2, 3}, n = 2

**Output:**

[{1, 2}, {1, 3}, {2, 3}]

**Reference:**

https://www.geeksforgeeks.org/python-program-to-get-all-subsets-of-given-size-of-a-set/

**Q10: We are given n arrays of any size which may have common elements, we need to combine all these arrays in such a way that each element should occur only once and elements should be in sorted order.**

**Input :** arr = [[1, 2, 2, 4, 3, 6],
[5, 1, 3, 4],
[9, 5, 7, 1],
[2, 4, 1, 3]]
**Output :** [1, 2, 3, 4, 5, 6, 7, 9]

**Reference Link:**
https://www.geeksforgeeks.org/set-update-python-union-n-arrays/

**Q11. A Heterogram String is a word/phrase/sentence in which no letter of the alphabets occurs more than once. Given a string, print whether it is heterogram or not. Print "Yes" for a heterogram string, otherwise "No". (Lower case alphabet and Upper case alphabets will be considered the same).**

**Example 1**
Input: "geeksforgeeks"
Output: "No"
**Explanation:** The string "geeksforgeeks" has letters g, e, k, s more than once and hence it is not a heterogram.

**Example 2**

Input: “thebigdwarf”

Output: “Yes”

**Explanation:** The string “thebigdwarf” has all the letters occurring only once and hence is a heterogram.

**Hint:** Use dictionary or set to store data.

**Reference Link:**

https://www.geeksforgeeks.org/python-set-check-whether-given-string-heterogram-not/

**Q12. Given two sets of strings, the task is to find the count pairs of strings one from set 1 and one from set 2 that complete each other. Two strings complete each other when after their concatenation, the resultant string has all 26 alphabets present in it. (Consider the strings to be case insensitive and ).**

**Example:**

**Input :** set1[] = {"abcdefgh", "geeksforgeeks",
"lmnopqrst", "abc"}
set2[] = {"ijklmnopqrstuvwxyz",
"abcdefghijklmnopqrstuvwxyz",
"Defghijklmnopqrstuvwxyz".}

**Output:** 7

One of the pair that forms completes each other is "abcdefgh" (Set 1) and “ijklmnopqrstuvwxyz” (set 2). There are total 7 such pairs

**Hint:** Use set data structure to check for completeness.

**Reference Link:**

https://www.geeksforgeeks.org/python-set-pairs-complete-strings-two-sets/

**Q13. Given a string, the task is to check if every vowel is present or not. We consider a vowel to be present if it is present in uppercase or lowercase. i.e. 'a', 'e', 'i'.'o', 'u' or 'A', 'E', 'I', 'O', 'U' .**

**Input 1 :** geeksforgeeks

**Output 1 :** Not Accepted

**Explanation :** All vowels except 'o' are not present

**Input 2:** ABeeIghiObhkUul

**Output 2 :** Accepted

**Explanation :** All vowels are present

**Hint:** Start by converting the string to all lowercase(or uppercase).

**Reference Link:**

https://www.geeksforgeeks.org/python-program-to-accept-the-strings-which-contains-all-vowels/

**Q14.** Given is a nested tuple. Write a program to modify the first item (22) of a list inside a following tuple to 222

**Input:**

**tuple1 = (11, [22, 33], 44, 55)**

**output:**

**tuple1: (11, [222, 33], 44, 55)**

**HINT:** The given tuple is a nested tuple. Use indexing to locate the specified item and modify it using the assignment operator.

**Reference Link:** https://pynative.com/python-tuple-exercise-with-solutions/

**Q15: Extract the digits from a tuple and output as a list.**

**Example:**

Input: (12, 32, 1, 9, 76)

Output: [1,2,3,6,7,9]

**Reference Link:**

https://www.geeksforgeeks.org/python-extract-digits-from-tuple-list/

**Q16: Given a dictionary in Python, write a Python program to find the sum of all items in the dictionary.**

**Example :**

Input: {'a': 100, 'b':200, 'c':300}

Output: 600

**Reference Link:**

https://www.geeksforgeeks.org/python-program-to-find-the-sum-of-all-items-in-a-dictionary/

**Q17. Change the signs of elements of tuples in a list**

**Given a dual Tuple list, the task is to write a python program to convert the second element to negative magnitude of each tuple and the first element to**

**positive magnitude of each tuple.**

**Input** : test_list = [(3, -1), (-4, -3), (1, 3), (-2, 5), (-4, 2), (-9, -3)]

**Output:** [(3, -1), (4, -3), (1, -3), (2, -5), (4, -2), (9, -3)]

**Explanation:** All the first elements are positive, and 2nd index elements are negative, as desired.

**Reference Link:**

https://www.geeksforgeeks.org/python-change-signs-of-elements-of-tuples-in-a-list/

**Q18. Find the lonely number. You may return the answer in any order.**

**Explanaton:** A number x is lonely when it appears only once, and no adjacent numbers (i.e. x + 1 and x - 1) appear in the tuple. Return all lonely numbers in nums. Test Cases

**Input1**: nums = [10,6,5,8]

**Output1**: [10,8]

**Explanation:** We can clearly see that 5 has (5+1) and 6 has (6-1) in tuple. But 10 and 8 appear only once and dont have (x+1) or (x-1) in tuple. So they are lonely.

**Input2:** nums = [1,3,5,3]

**Output2:** [1,5]

**Explanation**: We can clearly see that 3 occurs twice in tuple. 1 and 5 neither appear more than once nor have (x-1) or (x+1) in the tuple. Hence they are lonely.

**Hint:**

**1**.Sorting? (Inbuilt sort function sorted( ). Difference between sort() and sorted())

**2**.Somehow count frequency of each number? Key: value pair?

**Reference Link:**
https://leetcode.com/problems/find-all-lonely-numbers-in-the-array/

**Q19. Maximum set bits?**

**You are given an integer tuple nums. You have to sort these numbers in increasing order of number of set bits in the binary representation of the numbers. If two numbers have same number of set bits, you can return them in any order.**

**Test Cases**

**Input 1**: nums = [10,6,4,7]

**Output 1**: [4, 10, 6, 7]

**Explanation:** $10 = (1010)_2$, $6 = (110)_2$, $4 = (100)_2$, $7 = (111)_2$
set_bits(10) → 2, set_bits(6) → 2, set_bits(4) → 1, set_bits(7) → 3
So we just need to sort in increasing order of set bits

**Input 2:** nums = [10,100,1,1000]

**Output 2**: [1, 10, 100, 1000]

**Explanation:** $10 = (1010)_2$, $100 = (1100100)_2$, $1 = (1)_2$, $1000 = (1111101000)_2$
set_bits(10) → 2, set_bits(100) → 3, set_bits(1) → 1, set_bits(1000) → 6

**Hint:**

1. Decimal to binary conversion?
2. Somehow count set bits for each number? Key: value pair?
3. Sorting dictionary according to values. Using lambda function?

**Q20.**

**You are given a string S. Suppose a character 'c' occurs consecutively X times in the string. Replace these consecutive occurrences of the character 'c' with (X, c) in the string.**

**Input1:**

A single line of input consisting of the string S.

**Output1 :**

A single line of output consisting of the modified string.

**Input2:**

1222311

**Output2:**

(1, 1) (3, 2) (1, 3) (2, 1)

**Explanation**

First, the character 1 occurs only once. It is replaced by (1, 1) . Then the character 2 occurs three times, and it is replaced by (3, 2) and so on.

**Q21.**

**Two words are anagrams if you can rearrange the letters from one to spell the other. Write a function called is_anagram that takes two strings and returns True if they are anagrams.**

**Input1:**

Two lines of input containing strings x and y.

**Output1:**

A single line of output - True if x and y are anagrams, otherwise False.

**Input2:**

bcdef

cdfeb

**Output2:**

True

**Explanation**

bcdef and cdfeb can be spelled using the same set of letters.

**Q.22 Find maximum subarray and return the maximum subarray along with its sum**

**Example:**

Input= [-2,1,-3,4,-1,2,1,-5,4]

Output= Max Subarray: [4,-1,2,1], sum = 6.