**10 Marks Coding Question**

**Difficulty level: Hard**

**Problem Statement - 1**

Given a tuple of strings representing student names, and a set of tuples where each tuple contains a student's name and their marks in a subject, write a Python program to calculate the average marks for each student present in both the tuple and the set. Store the result in a dictionary where the key is the student name and the value is their average marks.

If a student from the tuple is not present in the set, their average should be None. Print the final dictionary in ascending order of the student names.

**Input Format:**

The input consists of a tuple of strings representing student names and a set of tuples where each tuple contains a string (student name) and an integer (marks).

**Output Format:**

Print the dictionary with student names as keys and their average marks as values, sorted by student names.

**Code Constraints:**

1 ≤ number of students in the tuple ≤ 10

Marks are integers between 0 and 50.

There may be multiple entries for the same student in the set, and you must calculate their average.

**Solution: (Python language)**

student\_names = tuple(input("Enter student names, separated by commas:").split(","))

student\_marks = set()

n = int(input("How many student marks do you want to input?"))

for i in range(n):

name = input(f"Enter name for student {i+1}:")

marks = int(input(f"Enter marks for student {i+1}:"))

student\_marks.add((name, marks))

average\_marks = {}

for student in student\_names:

marks = [marks for name, marks in student\_marks if name == student.strip()]

if marks:

average\_marks[student.strip()] = sum(marks) / len(marks)

else:

average\_marks[student.strip()] = None

sorted\_average\_marks = dict(sorted(average\_marks.items()))

print("Average marks for each student:", sorted\_average\_marks)

**Sample Testcase 1**

**Input:**

Enter student names, separated by commas:ram, gopal, vidhi

How many student marks do you want to input?4

Enter name for student 1:ram

Enter marks for student 1:45

Enter name for student 2:gopal

Enter marks for student 2:43

Enter name for student 3:vidhi

Enter marks for student 3:40

Enter name for student 4:gopal

Enter marks for student 4:38

**Output:**

Average marks for each student: {'gopal': 40.5, 'ram': 45.0, 'vidhi': 40.0}

**Sample Testcase 2**

**Input:**

Enter student names, separated by commas:Arjun, Karn, Alex, David

How many student marks do you want to input?5

Enter name for student 1:Arjun

Enter marks for student 1:38

Enter name for student 2:Karn

Enter marks for student 2:39

Enter name for student 3:Ashok

Enter marks for student 3:42

Enter name for student 4:John

Enter marks for student 4:30

Enter name for student 5:Alex

Enter marks for student 5:35

**Output:**

Average marks for each student: {'Alex': 35.0, 'Arjun': 38.0, 'David': None, 'Karn': 39.0}

**Hidden Testcase 1 - (Easy) Weightage 10%**

**Input:**

Enter student names, separated by commas:Tezas

How many student marks do you want to input?1

Enter name for student 1:Usha

Enter marks for student 1:45

**Output:**

Average marks for each student: {'Tezas': None}

**Hidden Testcase 2 - (Easy) Weightage 10%**

**Input:**

Enter student names, separated by commas:Kajol, Rinki

How many student marks do you want to input?3

Enter name for student 1:Kajol

Enter marks for student 1:32

Enter name for student 2:Rinki

Enter marks for student 2:33

Enter name for student 3:Kajol

Enter marks for student 3:46

**Output:**

Average marks for each student: {'Kajol': 39.0, 'Rinki': 33.0}

**Hidden Testcase 3 - (Medium) Weightage 15%**

**Input:**

Enter student names, separated by commas:

How many student marks do you want to input?2

Enter name for student 1:Harsh

Enter marks for student 1:37

Enter name for student 2:Vardhan

Enter marks for student 2:38

**Output:**

Average marks for each student: {'': None}

**Hidden Testcase 4 - (Medium) Weightage 15%**

**Input:**

Enter student names, separated by commas:Kishan

How many student marks do you want to input?3

Enter name for student 1:Amy

Enter marks for student 1:40

Enter name for student 2:Happy

Enter marks for student 2:42

Enter name for student 3:Love

Enter marks for student 3:36

**Output:**

Average marks for each student: {'Kishan': None}

**Hidden Testcase 5 - (Hard) Weightage 25%**

**Input:**

Enter student names, separated by commas:

How many student marks do you want to input?0

**Output:**

Average marks for each student: {'': None}

**Hidden Testcase 6 - (Hard) Weightage 25%**

**Input:**

Enter student names, separated by commas:Geeta, Indra, Kunal

How many student marks do you want to input?0

**Output:**

Average marks for each student: {'Geeta': None, 'Indra': None, 'Kunal': None}

**Problem Statement - 2**

Write a Python program that takes two sets as input and performs the following operations:

1. Find the union of the two sets.
2. Find the intersection of the two sets.
3. Find the difference between the first and second set.

**Input Format:**

The input consists of two sets of integers.

**Output Format:**

Print the union, intersection, and difference of the sets.

**Code Constraints:**

1. 1 ≤ number of elements in each set ≤ 20
2. Integers are between -50 and 50.

**Solution: (Python language)**

def get\_set\_from\_user(prompt):

return set(map(int, input(prompt).split()))

set1 = get\_set\_from\_user("Enter elements of the Set1, separated by spaces:")

set2 = get\_set\_from\_user("Enter elements of the Set2, separated by spaces:")

union\_set = set1.union(set2)

intersection\_set = set1.intersection(set2)

difference\_set = set1.difference(set2)

print("\nUnion of the two sets:", union\_set)

print("Intersection of the two sets:", intersection\_set)

print("Difference (Set1 - Set2):", difference\_set)

**Sample Testcase 1**

**Input:**

Enter elements of the Set1, separated by spaces:1 2 3 4 5 6

Enter elements of the Set2, separated by spaces:5 6 7 8 9 10

**Output:**

Union of the two sets: {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}

Intersection of the two sets: {5, 6}

Difference (Set1 - Set2): {1, 2, 3, 4}

**Sample Testcase 2**

**Input:**

Enter elements of the Set1, separated by spaces:1 2 3 4 5 6 7 8

Enter elements of the Set2, separated by spaces:3 5 7 9 11 13

**Output:**

Union of the two sets: {1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 13}

Intersection of the two sets: {3, 5, 7}

Difference (Set1 - Set2): {1, 2, 4, 6, 8}

**Hidden Testcase 1 - (Easy) Weightage 10%**

**Input:**

Enter elements of the Set1, separated by spaces:1 2 3

Enter elements of the Set2, separated by spaces:1 2 3

**Output:**

Union of the two sets: {1, 2, 3}

Intersection of the two sets: {1, 2, 3}

Difference (Set1 - Set2): set()

**Hidden Testcase 2 - (Easy) Weightage 10%**

**Input:**

Enter elements of the Set1, separated by spaces:1 2 3 4

Enter elements of the Set2, separated by spaces:5 6 7 8

**Output:**

Union of the two sets: {1, 2, 3, 4, 5, 6, 7, 8}

Intersection of the two sets: set()

Difference (Set1 - Set2): {1, 2, 3, 4}

**Hidden Testcase 3 - (Medium) Weightage 15%**

**Input:**

Enter elements of the Set1, separated by spaces: 23 43 21 42 34 22 38

Enter elements of the Set2, separated by spaces: 11 10 35 42 46 32

**Output:**

Union of the two sets: {32, 34, 35, 38, 42, 43, 10, 11, 46, 21, 22, 23}

Intersection of the two sets: {42}

Difference (Set1 - Set2): {34, 38, 43, 21, 22, 23}

**Hidden Testcase 4 - (Medium) Weightage 15%**

**Input:**

Enter elements of the Set1, separated by spaces:-12 13 14 -15 16

Enter elements of the Set2, separated by spaces:11 12 13 14 15 16

**Output:**

Union of the two sets: {11, 12, 13, 14, 15, 16, -15, -12}

Intersection of the two sets: {16, 13, 14}

Difference (Set1 - Set2): {-15, -12}

**Hidden Testcase 5 - (Hard) Weightage 25%**

**Input:**

Enter elements of the Set1, separated by spaces:1 1 2 2 3 3 4 4

Enter elements of the Set2, separated by spaces:2 2 3 3 4 4 5 5

**Output:**

Union of the two sets: {1, 2, 3, 4, 5}

Intersection of the two sets: {2, 3, 4}

Difference (Set1 - Set2): {1}

**Hidden Testcase 6 - (Hard) Weightage 25%**

**Input:**

Enter elements of the Set1, separated by spaces:9 7 5 3 1

Enter elements of the Set2, separated by spaces:2 4 6 8 10

**Output:**

Union of the two sets: {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}

Intersection of the two sets: set()

Difference (Set1 - Set2): {1, 3, 5, 7, 9}