

# Rajalakshmi Engineering College

Name: Sherwin G M  
Email: 240701496@rajalakshmi.edu.in  
Roll no: 240701496  
Phone: 7708605966  
Branch: REC  
Department: I CSE FD  
Batch: 2028  
Degree: B.E - CSE

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## NeoColab\_REC\_CS23221\_Python Programming

### REC\_Python\_Week 5\_CY

Attempt : 1  
Total Mark : 40  
Marks Obtained : 40

### Section 1 : Coding

#### 1. Problem Statement

Riley is analyzing DNA sequences and needs to determine which bases match at the same positions in two given DNA sequences. Each DNA sequence is represented as a tuple of integers, where each integer corresponds to a DNA base.

Your task is to write a program that compares these two sequences and identifies the bases that match at the same positions and print it.

#### ***Input Format***

The first line of input consists of an integer  $n$ , representing the size of the first tuple.

The second line contains  $n$  space-separated integers, representing the elements of the first DNA sequence tuple.

The third line of input consists of an integer  $m$ , representing the size of the second tuple.

The fourth line contains  $m$  space-separated integers, representing the elements of the second DNA sequence tuple.

### **Output Format**

The output is a space-separated integer of the matching bases at the same positions in both sequences.

Refer to the sample output for format specifications.

### **Sample Test Case**

Input: 4  
5 1 8 4  
4  
4 1 8 2  
Output: 1 8

### **Answer**

```
n = int(input())
seq1 = tuple(map(int, input().split()))
m = int(input())
seq2 = tuple(map(int, input().split()))

matching_bases = [seq1[i] for i in range(min(n, m)) if seq1[i] == seq2[i]]
print(" ".join(map(str, matching_bases)))
```

**Status :** Correct

**Marks :** 10/10

## **2. Problem Statement**

Riya owns a store and keeps track of item prices from two different suppliers using two separate dictionaries. He wants to compare these prices to identify any differences. Your task is to write a program that calculates the absolute difference in prices for items that are present in

both dictionaries. For items that are unique to one dictionary (i.e., not present in the other), include them in the output dictionary with their original prices.

Help Riya to implement the above task using a dictionary.

### ***Input Format***

The first line of input consists of an integer  $n_1$ , representing the number of items in the first dictionary.

The next  $n_1$  lines contain two integers

1. The first line contains the item (key), and
2. The second line contains the price (value).

The following line consists of an integer  $n_2$ , representing the number of items in the second dictionary

The next  $n_2$  lines contain two integers

1. The first line contains the item (key), and
2. The second line contains the price (value).

### ***Output Format***

The output should display a dictionary that includes:

1. For items common to both dictionaries, the absolute difference between their prices.
2. For items that are unique to one dictionary, the original price from that dictionary.

Refer to the sample output for formatting specifications.

### ***Sample Test Case***

Input: 1

4

4

1

8

7

Output: {4: 4, 8: 7}

**Answer**

```
n1 = int(input())
dict1 = {}
for _ in range(n1):
    key = int(input())
    value = int(input())
    dict1[key] = value

n2 = int(input())
dict2 = {}
for _ in range(n2):
    key = int(input())
    value = int(input())
    dict2[key] = value

result = {}
for item in dict1:
    if item in dict2:
        result[item] = abs(dict1[item] - dict2[item])
    else:
        result[item] = dict1[item]

for item in dict2:
    if item not in dict1:
        result[item] = dict2[item]

print(result)
```

**Status :** Correct

**Marks :** 10/10

### 3. Problem Statement

Alex is tasked with managing the membership lists of several exclusive clubs. Each club has its own list of members, and Alex needs to determine the unique members who are part of exactly one club when considering all clubs together.

Your goal is to help Alex by writing a program that calculates the symmetric difference of membership lists from multiple clubs and then finds the total number of unique members.

### ***Input Format***

The first line of input consists of an integer  $k$ , representing the number of clubs.

The next  $k$  lines each contain a space-separated list of integers, where each integer represents a member's ID.

### ***Output Format***

The first line of output displays the symmetric difference of the membership lists as a set.

The second line displays the sum of the elements in this symmetric difference.

Refer to the sample output for the formatting specifications.

### ***Sample Test Case***

Input: 3

1 2 3

2 3 4

5 6 7

Output: {1, 4, 5, 6, 7}

23

### ***Answer***

```
k = int(input())
```

```
clubs = [set(map(int, input().split())) for _ in range(k)]
```

```
symmetric_diff = clubs[0]
```

```
for club in clubs[1:]:
```

```
    symmetric_diff ^= club
```

```
print(symmetric_diff)
```

```
print(sum(symmetric_diff))
```

Status : Correct

Marks : 10/10

#### 4. Problem Statement

Noah, a global analyst at a demographic research firm, has been tasked with identifying which country experienced the largest population growth over a two-year period. He has a dataset where each entry consists of a country code and its population figures for two consecutive years. Noah needs to determine which country had the highest increase in population and present the result in a specific format.

Help Noah by writing a program that outputs the country code with the largest population increase, along with the increase itself.

##### **Input Format**

The first line of input consists of an integer N, representing the number of countries.

Each of the following N blocks contains three lines:

1. The first line is a country code.
2. The second line is an integer representing the population of the country in the first year.
3. The third line is an integer representing the population of the country in the second year.

##### **Output Format**

The output displays the country code and the population increase in the format {code: difference}, where code is the country code and difference is the increase in population.

Refer to the sample output for formatting specifications.

##### **Sample Test Case**

Input: 3  
01

1000

1500

02

2000

2430

03

1500

3000

Output: {03:1500}

### **Answer**

```
N = int(input())
```

```
max_increase = -1
```

```
country_code = "
```

```
for _ in range(N):
```

```
    code = input()
```

```
    pop1 = int(input())
```

```
    pop2 = int(input())
```

```
    increase = pop2 - pop1
```

```
    if increase > max_increase:
```

```
        max_increase = increase
```

```
        country_code = code
```

```
print(f"{{{country_code}:{max_increase}}}")
```

**Status : Correct**

**Marks : 10/10**