Name : Prathamsinh

ER .No:22162171004

Batch : CS 54

Institute of Computer Technology
B. Tech Computer Science and Engineering

Sub: Algorithm Analysis and Design

Practical 1

(1) There are 2 chefs, namely chef 1 and chef 2 in the MasterChef competition. The judge is going to judge on the basis of 3 categories: presentation, taste and hygiene to prepare the dishes. The marking is scaling from 1 to 100. The rating for chef 1 challenge is the triplet a = (a[0],a[1], a[2]), and the rating for Chef 2 challenge is the triplet b = (b[0], b[1], b[2]), where 0 index is presentation, 1 index is taste and 2 index is hygiene.

The task is to find their comparison points by comparing a[0] with b[0], a[1] with b[1], and a[2] with b[2].

- If a[i] > b[i], then Chef 1 is awarded 1 point.
- If a[i] < b[i], then Chef 2 is awarded 1 point.
- If a[i] = b[i], then neither person receives a point.

Comparison points are the total points a person earned. Given a and b, determine their respective comparison points.

Design the algorithm for the same and implement using the programming language of yourchoice. Make comparative analysis for various use cases & input size.

Sample Input 1

27 48 70

89 26 7

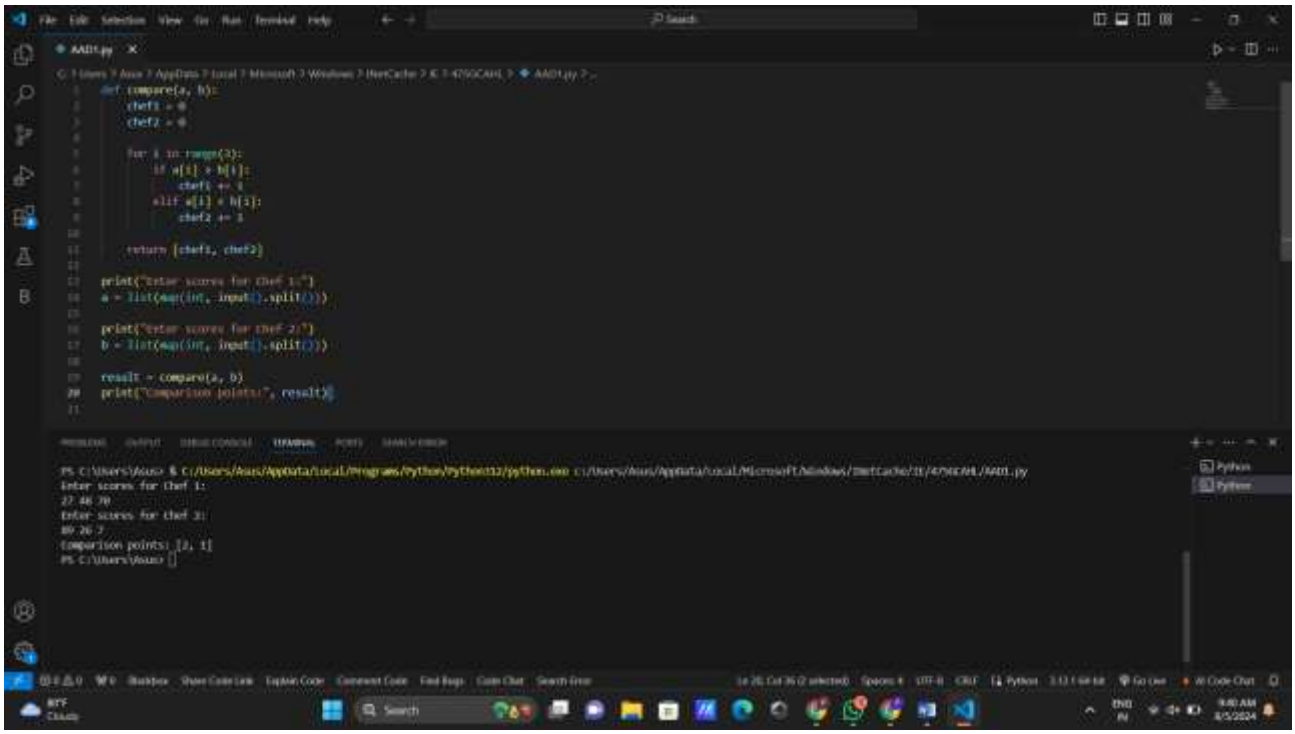
Sample Output 1

2 1

Explanation 1

Comparing the 0th elements, 27<89 so Chef 2 receives a point.
Comparing the 1st and 2nd elements, 48>26 and 70>7 so Chef 1 receives two points.The return array is [2,1].

CODE:



(2) Let us suppose that you are having an array containing both positive and negative numbers. Given the numbers you are supposed to find 2 such elements such that the sum of those numbers is closest to zero.

Sample Input 1

15, 5, -20, 30, -45

Sample Output 1

15, -20

Explanation 1

In all the comparison, the sum of 15 and -20 is smallest amount among all other comparison.

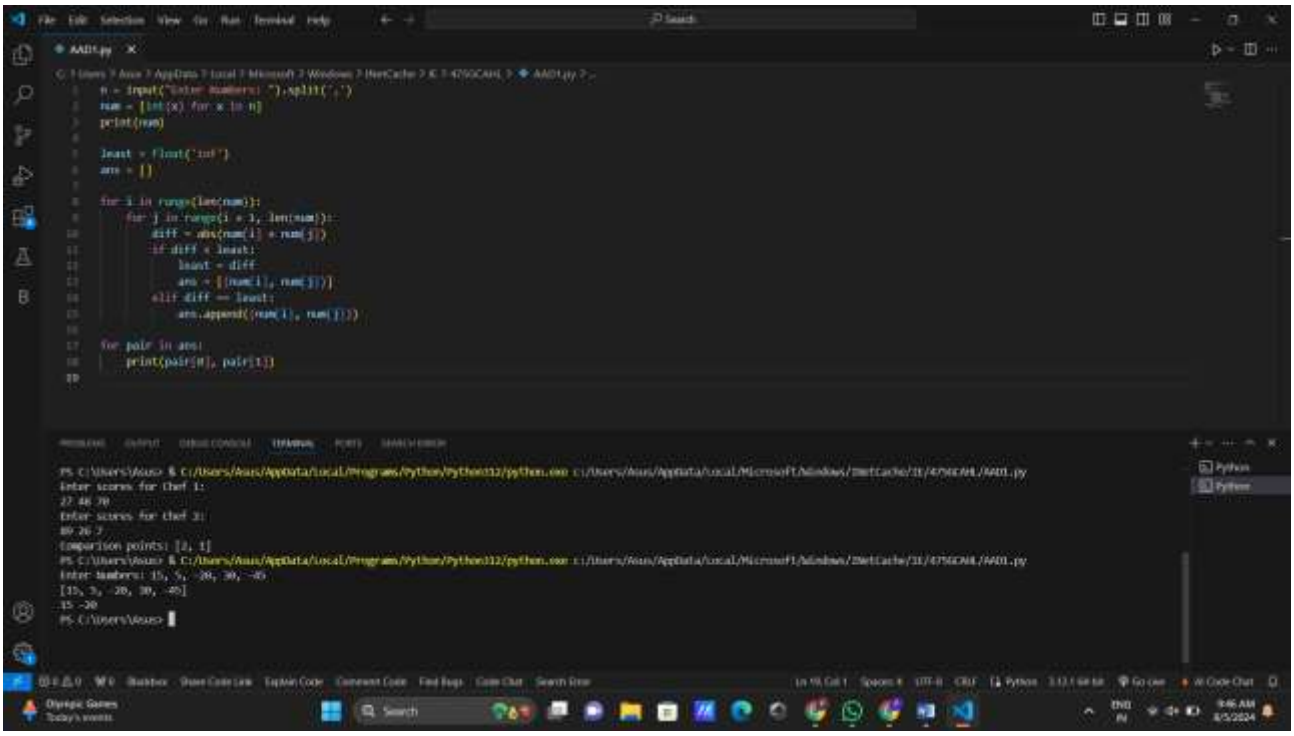
Sample Input 2

15, 5, -20, 30, 25

Explanation 2

In all the comparison, the sum of 15,-20 & -20, 25 is smallest amount among all other comparison.

CODE:


n = input("Enter numbers: ").split(',')
num = [int(x) for x in n]
print(num)
least = float('inf')
ans = []
for i in range(len(num)):
for j in range(i + 1, len(num)):
diff = abs(num[i] - num[j])
if diff < least:
least = diff
ans = [(num[i], num[j])]
elif diff == least:
ans.append((num[i], num[j]))
for pair in ans:
print(pair[0], pair[1])
PS C:\Users\Asus> & C:/Users/Asus/AppData/Local/Programs/Python/Python312/python.exe c:/Users/Asus/AppData/Local/Microsoft/Windows/INetCache/IE/4TNGCAH4./AAD1.py
Enter scores for Chef 1:
27 46 38
Enter scores for Chef 2:
89 26 7
Comparison points: [2, 1]
PS C:\Users\Asus> & C:/Users/Asus/AppData/Local/Programs/Python/Python312/python.exe c:/Users/Asus/AppData/Local/Microsoft/Windows/INetCache/IE/4TNGCAH4./AAD1.py
Enter Numbers: 15, 5, -20, 30, -45
[15, 5, -20, 30, -45]
15 -20
PS C:\Users\Asus>