

IC100 Tierce 2

Instructions:

- a. There are two problems. Please create two python files for solving them. Give names to the files like `problem1_batchNo_name_rollno`.
- b. Keep two files in a folder named `tierce2_batchNo_name_rollno` and submit in “`tierce_2`” folder of Piazza sharing with **all “Instructors”**.

Problems:

1. Suppose 4 friends - F1, F2, F3, and F4 have gone for a trip. Initially each of them carried Rs. 10000. During the trip, there are various expenses like - hotel rent, food, entry fees etc. Each expense can be evenly/unevenly shared by all/some of the four friends; however during payment only one person pays for it (can be a different person for different expenses).

Write a python program where they can track their expenses and at any time print how much who owes whom. Furthermore, it gives the option to settle down all the dues among the friends at any point of time. If someone tries to pay more than his current balance, raise an error and ask some other person to pay.

Please create separate functions to handle functionalities like - (i) showing balance, (ii) adding expense, (iii) showing and settling dues.

Input/Output Flow:

```
Press 1 to show balances
Press 2 to show and settle dues
Press 3 to add another expense
Press 4 to exit
Please select what you want to do? 1
```

```
The balances are F1 - 10000, F2 - 10000, F3 - 10000, F4 - 10000
```

```
Press 1 to show balances
Press 2 to show and settle dues
Press 3 to add another expense
Press 4 to exit
Please select what you want to do? 3
```

```
What is the expense? Food Bill
Amount? 3000
```

Who paid for it? F3

Press "Yes" if equal shares, press "No" to specify shares - No

Share of F1 - 1000

Share of F2 - 500

Share of F3 - 1500

Share of F4 - 0

The expense "Food Bill" has been added successfully.

Press 1 to show balances

Press 2 to show and settle dues

Press 3 to add another expense

Press 4 to exit

Please select what you want to do? 1

The balances are F1 - 10000, F2 - 10000, F3 - 7000, F4 - 10000

Press 1 to show balances

Press 2 to show and settle dues

Press 3 to add another expense

Press 4 to exit

Please select what you want to do? 2

To settle dues -

F1 to pay Rs. 1000 to F3

F2 to pay Rs. 500 to F3

Are dues settled (Yes/No)? Yes

Press 1 to show balances

Press 2 to show and settle dues

Press 3 to add another expense

Press 4 to exit

Please select what you want to do? 1

The balances are F1 - 9000, F2 - 9500, F3 - 8500, F4 - 10000

Press 1 to show balances

Press 2 to show and settle dues

Press 3 to add another expense

Press 4 to exit

Please select what you want to do? 4

Thanks. Exiting...

[Marks - 25]

2. Let n be a positive integer. A partition of n is a way of writing n as a sum of positive integers. For example, all the partitions of 5 are:

$1+1+1+1+1$

$1+1+1+2$

$1+1+3$

$1+2+2$

$1+4$

$2+3$

5

Write a recursive python function to compute the number of partitions of n and print them. Different permutations of the summands (1,2 etc) in a partition do not generate new partitions. For example, the partition $1+2+2$ is treated the same as $2+1+2$ and also as $2+2+1$. In order to avoid repetitions of partitions, choose summands in a way such that they are in non-decreasing order. Additionally, generate only the partitions with non-repetitive summands i.e. $1+2+2$ is not valid as 2 comes twice whereas $1+4$ is a valid partition.

[Marks - 15]