

# Rajalakshmi Engineering College

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## NeoColab\_REC\_CS23221\_Python Programming

### REC\_Python\_Week 1\_CY

Attempt : 1  
Total Mark : 40  
Marks Obtained : 40

### Section 1 : Coding

#### 1. Problem Statement

Shawn is planning for his younger sister's college education and wants to ensure she has enough funds when the time comes. He starts with an initial principal amount and plans to make regular monthly contributions to a savings account that offers a fixed annual interest rate.

Shawn needs to calculate the total amount that will accumulate by the time his sister is ready for college. Your task is to write a program that calculates the final amount in the savings account based on the initial principal, monthly contributions, annual interest rate, and the number of months the money is invested.

Formula:

$$A = P \times (1 + r/n)^{(n \times t)} + C \times [(1 + r/n)^{(n \times t)} - 1] / (r/n)$$

Where:

A = Final amount after the specified time

P = Initial principal amount

C = Monthly contribution

r = Annual interest rate (as a decimal, e.g., 5% = 0.05)

n = Number of compounding periods per year (12 for monthly compounding)

t = Total time in years (months / 12)

### ***Input Format***

The first line of input consists of a float P, representing the initial principal amount.

The second line of input consists of a float R, representing the annual interest rate (in percentage).

The third line of input consists of a float C, representing the monthly contribution.

The fourth line of input consists of an integer M, representing the number of months.

### ***Output Format***

The output displays "Final amount after X months: Rs." followed by the total accumulated amount, formatted to two decimal places, where X is the number of months.

Refer to the sample output for the formatting specifications.

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

Input: 10000.0

5.0

2000.0

12

Output: Final amount after 12 months: Rs.35069.33

**Answer**

```
p=float(input())
r=float(input())
c=float(input())
n=int(input())
r=r/100
t=n/12
compounding=12
amt=(p*(1+r/compounding)**(compounding*t)+c*(((1+r/
compounding)**(compounding*t)-1)/(r/compounding)))
print(f"Final amount after {n} months: Rs. {amt:.2f}")
```

**Status : Correct**

**Marks : 10/10**

## 2. Problem Statement

Liam and his friends are sharing the cost of a group purchase. The total cost of the purchase is subject to a 10% discount. One of the friends receives a 35% bonus, which means they will pay a larger portion of the discounted cost. The remaining cost is then divided equally among the other friends.

Write a program to:

Calculate the total cost after applying a 10% discount. Determine the amount paid by the friend who receives a 35% bonus. Calculate the amount each of the other friends will pay.

**Input Format**

The first line of input consists of a float value  $f$ , representing the total cost.

The second line contains an integer value  $n$ , representing the total number of friends.

**Output Format**

The first line of output displays "Cost after a 10% discount: " followed by the discounted cost of the ticket package as a float value formatted to two decimal places.

The second line displays "Friend with a 35% bonus pays: " followed by the amount paid by the friend with the bonus as a float value formatted to two decimal places.

The third line displays "Each of the other friends pays: " followed by the individual share of the remaining cost as a float value formatted to two decimal places.

Refer to the sample output for the formatting specifications.

### **Sample Test Case**

Input: 10000.0

5

Output: Cost after a 10% discount: 9000.00

Friend with a 35% bonus pays: 3150.00

Each of the other friends pays: 1462.50

### **Answer**

```
total=float(input())
n=int(input())
discount=0.1*total
discounted_price=total-discount
friend=0.35*discounted_price
other=(discounted_price-friend)/(n-1)
print(f"Cost after a 10% discount: {discounted_price:.2f}")
print(f"Friend with a 35% bonus pays: {friend:.2f}")
print(f"Each of the other friends pays: {other:.2f}")
```

**Status :** Correct

**Marks :** 10/10

## **3. Problem Statement**

Olivia is creating a wellness dashboard for her new fitness app, FitTrack. She needs a program that can capture and display key details about a user's workout. The program should read the user's full name, the total steps they ran, the energy they expended in kilojoules, and the duration of their workout in hours. After collecting this information, the program will

generate a detailed summary of the user's fitness activity.

Your task is to guide Olivia through the program.

### ***Input Format***

The first line of input consists of a string, representing the user's name.

The second line consists of an integer, representing the total steps taken.

The third line consists of a float value, representing the calories burned.

The fourth line consists of a float value, representing the workout duration in hours.

### ***Output Format***

The first line of output prints "User Name: " followed by the user's name.

The second line prints "Total Steps: " followed by the total steps.

The third line prints "Calories Burned: " followed by the calories burned, rounded off to one decimal place.

The fourth line prints "Workout Duration: X hours" where X is the workout duration, rounded off to one decimal place.

Refer to the sample output for formatting specifications.

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

Input: Alex

10000

350.5

1.5

Output: User Name: Alex

Total Steps: 10000

Calories Burned: 350.5

Workout Duration: 1.5 hours

### ***Answer***

```
name=str(input())
steps=int(input())
cal=float(input())
hours=float(input())
print("User Name: ",name)
print("Total Steps: ",steps)
print(f"Calories Burned: {cal:.1f}")
print(f"Workout Duration: {hours:.1f} hours")
```

**Status :** Correct

**Marks : 10/10**

#### 4. Problem Statement

Mandy is working on a mathematical research project involving complex numbers. For her calculations, she often needs to swap the real and imaginary parts of two complex numbers.

Mandy needs a Python program that takes two complex numbers as input and swaps their real and imaginary values.

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

The first line of input consists of a complex number in the format  $a+bj$ , representing the first complex number.

The second line consists of a complex number in the format  $a+bj$ , representing the second complex number.

##### ***Output Format***

The first line of output displays "New first complex number: " followed by the swapped complex number.

The second line of output displays "New second complex number: " followed by the swapped complex number.

Refer to the sample output for the formatting specifications.

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

Input: 10+8j  
7-9j

Output: New first complex number: (8+10j)  
New second complex number: (-9+7j)

**Answer**

```
c1=complex(input())  
c2=complex(input())  
new_c1=complex(c1.imag,c1.real)  
new_c2=complex(c2.imag,c2.real)  
print("New first complex number: ",new_c1)  
print("New second complex number: ",new_c2)
```

**Status :** Correct

**Marks :** 10/10