

# Rajalakshmi Engineering College

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Batch: 2028  
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## NeoColab\_REC\_CS23221\_Python Programming

### REC\_Python\_Week 1\_MCQ

Attempt : 1  
Total Mark : 15  
Marks Obtained : 15

#### Section 1 : MCQ

1. Which of the following operators has its associativity from right to left?

**Answer**

**\*\***

**Status : Correct**

**Marks : 1/1**

2. What is the output of the below expression?

```
print(3*1**3)
```

**Answer**

**3**

**Status : Correct**

**Marks : 1/1**

3. What is the output of the following program?

```
print((1, 2) + (3, 4))
```

**Answer**

(1, 2, 3, 4)

**Status : Correct**

**Marks : 1/1**

4. What is the value of the following expression?

8/4/2, 8/(4/2)

**Answer**

(1.0,4.0)

**Status : Correct**

**Marks : 1/1**

5. Which of these is not a core data type?

**Answer**

Class

**Status : Correct**

**Marks : 1/1**

6. What will be the value of the following Python expression?

4 + 3 % 5

**Answer**

7

**Status : Correct**

**Marks : 1/1**

7. What is the value of x in the following program?

```
x = int(43.55+2/2)
print(x)
```

**Answer**

44

**Status :** Correct

**Marks :** 1/1

8. What is the return type of the function id?

**Answer**

int

**Status :** Correct

**Marks :** 1/1

9. What is the value of the following expression?

float(22//3+3/3)

**Answer**

8.0

**Status :** Correct

**Marks :** 1/1

10. Which of the following represents the bitwise XOR operator?

**Answer**

^

**Status :** Correct

**Marks :** 1/1

11. Which is the correct operator for power(xy)?

**Answer**

x\*\*y

**Status :** Correct

**Marks :** 1/1

12. Which of the following is an example of the type casting?

**Answer**

All of the above

**Status :** Correct

**Marks :** 1/1

13. What will the following code output?

```
z = 3 + 4j  
print(abs(z))
```

**Answer**

5.0

**Status :** Correct

**Marks :** 1/1

14. What is used to concatenate two strings in Python?

**Answer**

+ operator

**Status :** Correct

**Marks :** 1/1

15. Evaluate the expression given below if A= 16 and B = 15

A % B // A

**Answer**

0

**Status :** Correct

**Marks :** 1/1

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## NeoColab\_REC\_CS23221\_Python Programming

### REC\_Python\_Week 1\_COD

Attempt : 1

Total Mark : 5

Marks Obtained : 5

### Section 1 : Coding

#### 1. Problem Statement

Quentin, a mathematics enthusiast, is exploring the properties of numbers. He believes that for any set of four consecutive integers, calculating the average of their fourth powers and then subtracting the product of the first and last numbers yields a constant value.

To validate his hypothesis, check if the result is indeed constant and display.

Example:

Input:

5

Output:

Constant value: 2064.5

Explanation:

Find the Average:

Average:  $(625 + 1296 + 2401 + 4096)/4 = 2104.5$

Now, we calculate the product of a and (a + 3):

Product =  $5 \times (5 + 3) = 5 \times 8 = 40$

Final result:  $2104.5 - 40 = 2064.5$

### ***Input Format***

The input consists of an integer a, representing the first of four consecutive integers.

### ***Output Format***

The output displays "Constant value: " followed by the computed result based on Quentin's formula.

Refer to the sample output for formatting specifications.

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

Input: 5

Output: Constant value: 2064.5

### ***Answer***

```
a=int(input())
sum=0
for i in range(4):
    b=(a+i)**4
    sum+=b
print("Constant value:",(sum/4)-(a*(a+3)))
```

**Status :** Correct

**Marks :** 1/1

## 2. Problem Statement

A company has hired two employees, Alice and Bob. The company wants to swap the salaries of both employees. Alice's salary is an integer value and Bob's salary is a floating-point value.

Write a program to swap their salaries and print the new salary of each employee.

### ***Input Format***

The first line of input consists of an integer N, representing Alice's salary.

The second line consists of a float value F, representing Bob's salary.

### ***Output Format***

The first line of output displays "Initial salaries:"

The second line displays "Alice's salary = N", where N is Alice's salary.

The third line of output displays "Bob's salary = F", where F is Bob's salary.

After a new line space, the following line displays "New salaries after swapping:"

The next line displays "Alice's salary = X", where X is the swapped salary.

The last line displays "Bob's salary = Y", where Y is the swapped salary.

Refer to the sample output for formatting specifications.

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

Input: 10000  
15400.55

Output: Initial salaries:  
Alice's salary = 10000  
Bob's salary = 15400.55

New salaries after swapping:

Alice's salary = 15400.55  
Bob's salary = 10000

**Answer**

```
a=int(input())
b=float(input())
print("Initial salaries:")
print("Alice's salary =",a)
print("Bob's salary =",b)
a,b=b,a
print("New salaries after swapping:")
print("Alice's salary =",a)
print("Bob's salary =",b)
```

**Status :** Correct

**Marks :** 1/1

### 3. Problem Statement

In a family, two children receive allowances based on the gardening tasks they complete. The older child receives an allowance rate of Rs.5 for each task, with a base allowance of Rs.50. The younger child receives an allowance rate of Rs.3 for each task, with a base allowance of Rs.30.

Your task is to calculate and display the allowances for the older and younger children based on the number of gardening tasks they complete, along with the total allowance for both children combined.

**Input Format**

The first line of input consists of an integer n, representing the number of chores completed by the older child.

The second line consists of an integer m, representing the number of chores completed by the youngest child.

**Output Format**

The first line of output displays "Older child allowance: Rs." followed by an integer representing the allowance calculated for the older sibling.

The second line displays "Younger child allowance: Rs." followed by an integer representing the allowance calculated for the youngest sibling.



The third line displays "Total allowance: Rs." followed by an integer representing the sum of both siblings' allowances.

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: 10

5

Output: Older child allowance: Rs.100

Younger child allowance: Rs.45

Total allowance: Rs.145

### **Answer**

```
a=int(input())
b=int(input())
older=50+(a*5)
younger=30+(b*3)
print("Older child allowance: Rs.",older)
print("Younger child allowance: Rs.",younger)
print("Total allowance: Rs.",older+younger)
```

**Status :** Correct

**Marks :** 1/1

## **4. Problem Statement**

A science experiment produces a decimal value as the result. However, the scientist needs to convert this value into an integer so that it can be used in further calculations.

Write a Python program that takes a floating-point number as input and converts it into an integer.

### **Input Format**

The input consists of a floating point number, F.

### **Output Format**

The output prints "The integer value of F is: {result}", followed by the integer number equivalent to the floating point number.

Refer to the sample output for the formatting specifications.

**Sample Test Case**

Input: 10.36

Output: The integer value of 10.36 is: 10

**Answer**

```
a=float(input())  
print("The integer value of",a,"is:",int(a))
```

**Status :** Correct

**Marks :** 1/1

## 5. Problem Statement

Bob, the owner of a popular bakery, wants to create a special offer code for his customers. To generate the code, he plans to combine the day of the month with the number of items left in stock.

Help Bob to encode these two values into a unique offer code.

Note: Use the bitwise operator to calculate the offer code.

**Example**

Input:

15

9

Output:

Offer code: 6

Explanation:

Given the day of the month 15th day (binary 1111) and there are 9 items left (binary 1001), the offer code is calculated as 0110 which is 6.

### ***Input Format***

The first line of input consists of an integer D, representing the day of the month.

The second line consists of an integer S, representing the number of items left in stock.

### ***Output Format***

The output displays "Offer code: " followed by an integer representing the encoded offer code.

Refer to the sample output for formatting specifications.

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

Input: 15

9

Output: Offer code: 6

### ***Answer***

# You are using Python

```
a=int(input())
```

```
b=int(input())
```

```
print("Offer code:",a^b)
```

**Status :** Correct

**Marks :** 1/1

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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

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**

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

**Status :** Correct

**Marks :** 10/10

## **2. 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***

```
a=complex(input())
b=complex(input())
c=complex(a.imag,a.real)
d=complex(b.imag,b.real)
print("New first complex number: ",c)
print("New second complex number: ",d)
```

**Status :** Correct

**Marks :** 10/10

### 3. Problem Statement

Nina is working on a project involving multiple sensors. Each sensor provides a data point that needs to be processed to compute an aggregated value.

Given data points from three sensors, write a program to calculate the aggregated value using specific bitwise operations and arithmetic manipulations. The final result should be the aggregated value modulo 1000.

Example:

Input:

1 //sensor 1 data

2 //sensor 2 data

3 //sensor 3 data

Output

9

Explanation

Calculate the bitwise AND of sensor 1 data and sensor 2 data: 0

Calculate the XOR of the result from step 1 and sensor 3 data: 3

Multiply the result from step 2 by 3: 9

Compute the final aggregated value by taking the result from step 3 modulo 1000: 9

So, the aggregated value is 9.

**Input Format**

The first line of input consists of an integer S1, representing sensor1 data.

The second line of input consists of an integer S2, representing sensor2 data.

The third line of input consists of an integer S3, representing sensor3 data.

### **Output Format**

The output displays an integer representing the aggregated value.

Refer to the sample output for the formatting specifications.

### **Sample Test Case**

Input: 1

2

3

Output: 9

### **Answer**

```
a=int(input())
b=int(input())
c=int(input())
d=a&b
e=d^c
print((e*3)%1000)
```

**Status :** Correct

**Marks : 10/10**

## **4. 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())
d=int(input())
t=d/12
interest=r/100
n=12
b=((1+(interest/n))**(n*t))
f=(b-1)/(interest/n)
a=p*b+c*f
print("Final amount after",d,"months: Rs.{:.2f}".format(a))
```

**Status :** Correct

**Marks :** 10/10

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## NeoColab\_REC\_CS23221\_Python Programming

### REC\_Python\_Week 1\_PAH

Attempt : 1  
Total Mark : 6  
Marks Obtained : 6

### Section 1 : Coding

#### 1. Problem Statement

Oliver is planning a movie night with his friends and wants to download a high-definition movie. He knows the file size of the movie in megabytes (MB) and his internet speed in megabits per second (Mbps). To ensure the movie is ready in time, Oliver needs to calculate the download time.

Your task is to write a program that calculates the download time and displays it in hours, minutes, and seconds.

Example

Input:

MB = 800

mbps = 40

**Output:**

Download Time: 0 hours, 2 minutes, and 40 seconds

**Explanation:**

Convert the file size to bits ( $800 \text{ MB} * 8 \text{ bits/byte} = 6400 \text{ megabits}$ ) and divide it by the download speed ( $6400 \text{ Mbps} / 40 \text{ Mbps} = 160 \text{ seconds}$ ). Now, convert the download time in seconds to hours, minutes, and seconds: 160 seconds is equal to 2 minutes and 40 seconds. So, the download time is 0 hours, 2 minutes and 40 seconds.

***Input Format***

The first line of input consists of an integer N, representing the file size in megabytes (MB).

The second line consists of an integer S, representing the network speed in megabits per second (mbps).

***Output Format***

The output prints "Download Time: X hours, Y minutes, and Z seconds", where X, Y, and Z are integers representing the hours, minutes, and seconds respectively.

Refer to the sample output for formatting specifications.

***Sample Test Case***

Input: 180

3

Output: Download Time: 0 hours, 8 minutes, and 0 seconds

***Answer***

```
mb=int(input())
mbps=int(input())
sec=(mb*8)/mbps
hours=sec//3600
minutes=(sec%3600)//60
secs=sec%60
print("Download Time: ",int(hours),"hours",int(minutes),"minutes,
```

and",int(secs),"seconds")

**Status :** Correct

**Marks :** 1/1

## 2. Problem Statement

Ella, an avid TV show enthusiast, is planning a binge-watching marathon for a new series. She has a specific routine: after watching a set number of episodes, she takes a short break.

She is provided with the following information:

Each episode of the series has a fixed duration of 45 minutes. After a certain number of episodes, there is a break of 15 minutes.

Ella wants to know the total time she will need to watch the entire series, including the breaks. Your task is to help Ella by calculating the total viewing time.

### **Input Format**

The first line of input consists of an integer E, representing the total number of episodes in the series.

The second line consists of an integer B, representing the number of episodes watched before taking a break.

### **Output Format**

The output prints an integer representing the total viewing time required to watch the entire series, including the breaks.

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: 5

2

Output: 255 minutes

### **Answer**

```
a=int(input())
b=int(input())
c=(a-1)//b
d=(a*45)+(c*15)
print("{} minutes".format(d))
```

**Status :** Correct

**Marks :** 1/1

### 3. Problem Statement

A smart home system tracks the temperature and humidity of each room. Create a program that takes the room name (string), temperature (float), and humidity (float).

Display the room's climate details.

#### **Input Format**

The first line of input consists of a string, representing the room name.

The second line consists of a float value, representing the temperature.

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

#### **Output Format**

The first line of output prints "Room: " followed by the room name (string).

The second line prints "Temperature: " followed by the temperature (float) formatted to two decimal places.

The third line prints "Humidity: " followed by the humidity (float) formatted to two decimal places and a percentage sign (%).

Refer to the sample output for formatting specifications.

#### **Sample Test Case**

Input: Living Room  
23.45

45.78

Output: Room: Living Room

Temperature: 23.45

Humidity: 45.78%

**Answer**

```
a=input()
b=float(input())
c=float(input())
print("Room:",a)
print("Temperature: {:.2f}".format(b))
print("Humidity: {:.2f}%".format(c))
```

**Status :** Correct

**Marks :** 1/1

#### 4. Problem Statement

Mandy is debating with her friend Rachel about an interesting mathematical claim. Rachel asserts that for any positive integer  $n$ , the ratio of the sum of  $n$  and its triple to the integer itself is always 4. Mandy, intrigued by this statement, decides to validate it using logical operators and basic arithmetic.

She wants to confirm if the statement holds true for any positive integer  $n$ .

**Input Format**

The input consists of a positive integer  $n$ , representing the integer to be tested.

**Output Format**

The first line of output displays "Sum:" followed by an integer representing the calculated sum.

The second line displays "Rachel's statement is: " followed by a Boolean value indicating whether Rachel's statement is correct.

Refer to the sample output for the formatting specifications.

### Sample Test Case

Input: 12

Output: Sum: 48

Rachel's statement is: True

### Answer

```
a=int(input())  
b=a+3*a  
print("Sum:",b)  
print("Rachel's statement is: True")
```

Status : Correct

Marks : 1/1

## 5. Problem Statement

Shawn, a passionate baker, is planning to bake cookies for a large party. His original recipe makes 15 cookies, with the following ingredient quantities: 2.5 cups of flour, 1 cup of sugar, and 0.5 cups of butter.

Write a program to calculate the amounts of flour, sugar, and butter needed for a different number of cookies. Provide the ingredient quantities for a specified number of cookies, maintaining the original proportions of the recipe.

### Input Format

The input consists of an integer  $n$ , representing the number of cookies.

### Output Format

The first line prints "Flour: X cups" where X represents the amount of flour required for  $n$  cookies, as a double value rounded to two decimal places.

The second line prints "Sugar: Y cups" where Y represents the amount of Sugar required for  $n$ , as a double value rounded to two decimal places.

The third line prints "Butter: Z cups" where Z represents the amount of flour required for  $n$ , as a double value rounded to two decimal places.



Refer to the sample output for formatting specifications.

**Sample Test Case**

Input: 15

Output: Flour: 2.50 cups

Sugar: 1.00 cups

Butter: 0.50 cups

**Answer**

```
a=int(input())
flour=(2.50/15)*a
sugar=(1.00/15)*a
butter=(0.50/15)*a
print("Flour: {:.2f} cups".format(flour))
print("Sugar: {:.2f} cups".format(sugar))
print("Butter: {:.2f} cups".format(butter))
```

**Status :** Correct

**Marks :** 1/1

## 6. Problem Statement

Liam works at a car dealership and is responsible for recording the details of cars that arrive at the showroom. To make his job easier, he wants a program that can take the car's make, model, and price, and display the information in a formatted summary.

Assist him in the program.

**Input Format**

The first line of input contains a string, representing the car make.

The second line contains a string, representing the car model.

The third line contains a float value, representing the car price.

**Output Format**

The first line of output prints "Car Make: ", followed by the car make.

The second line prints "Car Model: ", followed by the car model.

The third line prints "Price: ", followed by the car price, formatted to two decimal places.

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: Toyota

Camry

23450.75

Output: Car Make: Toyota

Car Model: Camry

Price: Rs.23450.75

### **Answer**

```
a=str(input())
```

```
b=input()
```

```
c=float(input())
```

```
print("Car Make:",a)
```

```
print("Car Model:",b)
```

```
print("Price: Rs.{:.2f}".format(c))
```

**Status : Correct**

**Marks : 1/1**