Rajalakshmi Engineering College

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NeoColab_REC_CS23221_Python Programming

REC_Python_Week 1_MCQ

Attempt : 1
Total Mark : 15
Marks Obtained : 13

Section 1 : MCQ

1.   What does 3 ^ 4 evaluate to?

Answer

81

Status : Wrong   *Marks : 0/1*

2.   What will be the output of the following code?

```
x = int(34.56 - 2 * 2)
print(x)
```

Answer

30

Status : Correct   *Marks : 1/1*

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

Answer

x**y

Status : Correct   *Marks : 1/1*

4. Which of the following can convert the string to a float number?

Answer

float(str)

Status : Correct   *Marks : 1/1*

5. Which of the following expressions results in an error?

Answer

int('10.8')

Status : Correct   *Marks : 1/1*

6. 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*

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

Answer

float(5)

Status : Wrong   *Marks : 0/1*

8. What will the following code output?

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

Answer

5.0

Status : Correct   *Marks : 1/1*

9. The value of the expressions 4/(3*(2-1)) and 4/3*(2-1) is the same. True or False?

Answer

True

Status : Correct   *Marks : 1/1*

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

Answer

Class

Status : Correct   *Marks : 1/1*

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

Answer

+ operator

Status : Correct   *Marks : 1/1*

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

4 + 3 % 5

Answer

7

Status : Correct

Marks : 1/1

13. What is the value of the following expression?

float(22//3+3/3)

Answer

8.0

Status : Correct

Marks : 1/1

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

A % B // A

Answer

0

Status : Correct

Marks : 1/1

15. What is typecasting in Python?

Answer

Change data type property

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

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

```python
a=input()
b=input()
try:
    int(a)
except:
    a=float(a)
try:
    int(b)
except:
    b=float(b)
print(f"Initial salaries:\nAlice's salary={a}")
print(f"Bob's salary={b}")
print(f"New salaries after swapping:\nAlice's salary={b}")
```

```
print(f"Bob's salary={a}")
```

2. 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

```
a=int(input())
b=int(input())
print(f"Offer code:{a^b}")
```

Status : Correct   *Marks : 1/1*

3. 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())
b=int(a)
print(f"The integer value of {a} is:{b}")
```

Status : Correct   *Marks : 1/1*

4.   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())
aB=50
aE=5
bB=30
bE=3
aA=aB+(a*aE)
bA=bB+(b*bE)
print(f"Older child allowance: Rs.{aA}")
print(f"Younger child allowance: Rs.{bA}")
print(f"Total allowance: Rs.{aA+bA}")
```

Status : Correct   *Marks : 1/1*

5. 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 × (5 + 3) = 5 × 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

```
n=int(input())
s=0
for i in range(4):
    s+=((n+i)**4)
print(f"Constant value:{(s/4)-(n*(n+3))}")
```

Status : Correct   *Marks : 1/1*

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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 MB * 8 bits/byte = 6400 megabits) and divide it by the download speed (6400 Mbps / 40 Mbps = 160 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

```
a=int(input())
b=int(input())
s=(a*8)/b
m=int(s/60)
h=int(m/60)
m=m%60
s=s%60
```

```
print("Download Time: %dhours, %d minutes,and %d seconds" %(h,m,s))
```

Status : Correct   *Marks : 1/1*

2.   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=input()
c=input()
d="Room :%sTemperature: %s\nHumidity:%s"%(a,b,c)
print(d+"%")
```

Status : Correct   *Marks : 1/1*

3. 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=input()
b=input()
c=input()
print("Car Make: %s\nCar Model: %s\nPrice: Rs.%s"%(a,b,c))
```

Status : Correct   *Marks : 1/1*

4. 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

```
n=int(input())
f=2.5
s=1.0
b=0.5
c=15
fn=round((f/c)*n,2)
sn=round((s/c)*n,2)
bn=round((b/c)*n,2)
print(f"Flour:{fn:.2f} cups")
print(f"Sugar:{sn:.2f} cups")
print(f"Butter:{bn:.2f} cups")
```

Status : Correct   *Marks : 1/1*

5.   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*45+((a-1)//b)*15
print(f"{c} minutes")
```

Status : Correct   *Marks : 1/1*

6. 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*4
c=((b/a)==4)
print("Sum: %d\n Rachel's statement is:"%b,c)
```

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

Emily is organizing a taco party and needs to determine the total number of tacos required and the total cost. Each attendee at the party will consume 2 tacos. To ensure there are enough tacos:

If there are 10 or more attendees, Emily will need to provide an additional 5 tacos.If there are fewer than 10 attendees, Emily must ensure a minimum of 20 tacos are provided.

The cost of each taco is $25. Write a program that calculates both the total number of tacos required and the total cost based on the number of attendees.

Input Format

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

Output Format

The first line prints "Number of tacos needed: " followed by an integer representing the number of tacos needed for n attendees.

The second line prints "Total cost: " followed by an integer representing the total cost.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 10
Output: Number of tacos needed: 25
Total cost: 625

Answer

```
n=int(input())
if n>=10:
   taco_needed=(n*2)+5
else:
   if n*2<20:
      taco_needed=20
   else:
      taco_needed=n*2
print("Number of tacos needed:",taco_needed)
print("Total cost:",(taco_needed*25))
```

Status : Correct   *Marks : 10/10*

2. 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

```
username=input().strip()
totalsteps=int(input())
cal_burned=float(input())
wo_hours=float(input())
print(f"User Name: {username}")
print(f"Total Steps: {totalsteps}")
print(f"Calories Burned: {cal_burned:.1f}")
print(f"Workout Duration: {wo_hours:.1f} hours")
```

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

```
S1=int(input())
S2=int(input())
S3=int(input())
a=(S1&S2)
b=(a^S3)
c=(b*3)
d=(c%1000)
print(d)
```

Status : Correct   *Marks : 10/10*

4. 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

```
f=float(input())
n=int(input())
d=f*(90/100)
frbonus=d*(35/100)
remain=d-frbonus
otherfr=remain/(n-1)
print(f"cost after a 10% discount: {d:.2f}")
print(f"Friend with a 35% bonus pays:{frbonus:.2f}")
print(f"Each of the other friends pays:{otherfr:.2f}")
```

Status : Correct   *Marks : 10/10*

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NeoColab_REC_CS23221_Python Programming

REC_Python_Week 2_MCQ

Attempt : 1
Total Mark : 15
Marks Obtained : 12

Section 1 : MCQ

1. What will be the output of the following code?

```
i = 1
while True:
    if i%0O7 == 0:
        break
    print(i)
    i += 1
```

Answer

1 2 3 4 5 6

Status : Correct   *Marks : 1/1*

2. What will be the output of the following Python code?

```
i = 0
while i < 5:
    print(i)
    i += 1
    if i == 3:
        break
else:
    print(0)
```

Answer

012

Status : Correct   *Marks : 1/1*

3. What is the output of the following code?

```
i = 5
while True:
    if i%0O9 == 0:
        break
    print(i)
    i += 1
```

Answer

Compile Time Error

Status : Correct   *Marks : 1/1*

4. What will be the output of the following Python code?

```
i = 1
while True:
    if i % 2 == 0:
        i += 1
        continue
    if i > 10:
        break
    print(i, end = " ")
```

```
    i += 2
```

Answer

1 3 5 7 9

Status : Correct   *Marks : 1/1*

5. Which keyword used in loops can skip the remaining statements for a particular iteration and start the next iteration?

Answer

continue

Status : Correct   *Marks : 1/1*

6. How many times will the inner for loop be executed in the below code?

```
i=0
while(True):
   for j in range(4,0,-2):
     print(i*j)
     print('')
     i=i+1
   if(i%2==0):
     break
```

Answer

2

Status : Wrong   *Marks : 0/1*

7. What will be the output of the following Python code?

```
i = 1
while True:
   if i%3 == 0:
     break
   print(i)
```

```
    i + = 1
```

Answer

1 2

Status : Wrong   *Marks : 0/1*

8. What will be the output of the following code snippet?

```
balloon_inflated = False
while not balloon_inflated:
    if not balloon_inflated:
        balloon_inflated = True
        print("inflate-", end="")
print("done")
```

Answer

inflate-done

Status : Correct   *Marks : 1/1*

9. What will be the output of the following Python code?

```
i = 1
while True:
    if i%3 == 0:
        break
    print(i)
    i += 1
```

Answer

1 2

Status : Correct   *Marks : 1/1*

10. What will be the output for the following code snippet?

```
i = 0
for i in range(10):
```

```
    break
print(i)
```

Answer

0

Status : Correct   *Marks : 1/1*

11. What will the following code output?

```
x = 0
while x < 5:
    if x == 3:
        break
    x += 1
else:
    print("Completed")
print(x)
```

Answer

3

Status : Correct   *Marks : 1/1*

12. What will be the output of the following Python code?

```
i = 1
while False:
    if i%2 == 0:
        break
    print(i)
    i += 2
```

Answer

The code runs successfully but does not print anything

Status : Correct   *Marks : 1/1*

13. What will be the output of the following Python code?

```
i = 5
while True:
    if i%0O11 == 0:
        break
    print(i, end = " ")
    i += 1
```

Answer

5 6 7 8 9 10

Status : Wrong   *Marks : 0/1*

14. What is the output of the following code?

```
for i in range(5):
    if i == 5:
        break
    else:
        print(i)
else:
    print("Here")
```

Answer

0 1 2 3 4 Here

Status : Correct   *Marks : 1/1*

15. What will be the output of the following Python code?

```
i = 1
while True:
    if i % 2 == 0:
        i += 1
        continue
    if i > 10:
        break
    print(i)
    i += 2
```

Answer

1 3 5 7 9

Status : Correct

Marks : 1/1

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NeoColab_REC_CS23221_Python Programming

REC_Python_Week 2_COD_Updated

Attempt : 1
Total Mark : 50
Marks Obtained : 50

Section 1 : Coding

1. Problem Statement

You work as an instructor at a math enrichment program, and your goal is to develop a program that showcases the concept of using control statements to manipulate loops. Your task is to create a program that takes an integer 'n' as input and prints the squares of even numbers from 1 to 'n', while skipping odd numbers.

Input Format

The input consists of a single integer, which represents the upper limit of the range.

Output Format

The output displays the square of even numbers from 1 to 'n' separated by lines.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 10
Output: 4
16
36
64
100

Answer

```
a=int(input())
for i in range (1,a+1):
    if(i%2==0):
        i=i*i
        print(i)
```

Status : Correct   *Marks : 10/10*

2. Problem Statement

Ethan, a curious mathematician, is fascinated by perfect numbers. A perfect number is a number that equals the sum of its proper divisors (excluding itself). Ethan wants to identify all perfect numbers within a given range.

Help him write a program to list these numbers.

Input Format

The first line of input consists of an integer start, representing the starting number of the range.

The second line consists of an integer end, representing the ending number of the range.

Output Format

The output prints all perfect numbers in the range, separated by a space.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 1
100

Output: 6 28

Answer

```
n=int(input())
b=int(input())
for i in range(n,b+1):
    s=0
    for j in range(1,i):
        if i%j==0:
            s=s+j
    if s==i:
        print(s)
```

Status : Correct   *Marks : 10/10*

3. Problem Statement

John, a software developer, is analyzing a sequence of numbers within a given range to calculate their digit sum. However, to simplify his task, he excludes all numbers that are palindromes (numbers that read the same backward as forward).

Help John find the total sum of the digits of non-palindromic numbers in the range [start, end] (both inclusive).

Example:

Input:

10

20

Output:

55

Explanation:

Range [10, 20]: Non-palindromic numbers are 10, 12, 13, 14, 15, 16, 17, 18, 19 and 20.

Digit sums: 1+0 + 1+2 + 1+3 + 1+4 + 1+5 + 1+6 + 1+7 + 1+8 + 1+9 + 2+0 = 55.

Output: 55

Input Format

The first line of input consists of an integer, representing the starting number of the range.

The second line of input consists of an integer, representing the ending number of the range.

Output Format

The output prints a single integer, representing the total sum of the digits of all non-palindromic numbers in the range.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 10
20
Output: 55

Answer

```
def is_palindrome(n):
    return str(n)==str(n)[::-1]
def digit_sum(n):
    return sum(int(digit) for digit in str(n))
start=int(input())
end=int(input())
```

```
total_sum=0
for num in range(start,end+1):
    if is_palindrome(num):
        continue
    total_sum += digit_sum(num)
print(total_sum)
```

Status : Correct   *Marks : 10/10*

4. Problem Statement

As a junior developer working on a text analysis project, your task is to create a program that displays the consonants in a sentence provided by the user, separated by spaces.

You need to implement a program that takes a sentence as input and prints the consonants while skipping vowels and non-alphabetic characters using only control statements.

Input Format

The input consists of a string representing the sentence.

Output Format

The output displays space-separated consonants present in the sentence.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: Hello World!
Output: H l l W r l d

Answer

```
s=input()
vowels = "AEIOUaeiou"
for c in s:
    if not c.isalpha() or c in vowels:
```

```
        continue
    print(c,end=" ")
```

Status : Correct   *Marks : 10/10*

5. Problem Statement

Emma, a mathematics enthusiast, is exploring a range of numbers and wants to count how many of them are not Fibonacci numbers.

Help Emma determine the count of non-Fibonacci numbers within the given range [start, end] using the continue statement.

Input Format

The first line of input consists of an integer, representing the starting number of the range.

The second line consists of an integer, representing the ending number of the range.

Output Format

The output prints a single integer, representing the count of numbers in the range that are not Fibonacci numbers.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 1
10
Output: 5

Answer

```
def is_fibonacci(n):
    a,b=0,1
    while a<=n:
        if a==n:
            return True
```

```python
        a,b=b,a+b
    return False
start=int(input())
end=int(input())
count=0
for num in range(start,end+1):
    if is_fibonacci(num):
        continue
    count +=1
print(count)
```

Status : Correct   ***Marks : 10/10***

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NeoColab_REC_CS23221_Python Programming

REC_Python_Week 2_PAH_Updated

Attempt : 1
Total Mark : 60
Marks Obtained : 60

Section 1 : Coding

1. Problem Statement

Rajesh wants to design a program that simulates a real-time scenario based on a mathematical concept known as the Collatz Conjecture. This concept involves the repeated application of rules to a given starting number until the number becomes 1. The rules are as follows:

If the number is even, divide it by 2.If the number is odd, multiply it by 3 and add 1.

Your task is to write a program that takes a positive integer as input, applies the Collatz Conjecture rules to it, counts the number of steps taken to reach 1, and provides an output accordingly. If the process exceeds 100 steps, the program should print a message indicating so and use break to exit.

Input Format

The input consists of a single integer, n.

Output Format

The output displays the total number of steps taken to reach 1 if it's under 100.

If it's more than 100, it displays "Exceeded 100 steps. Exiting...".

Refer to sample output for the formatting specifications.

Sample Test Case

Input: 6
Output: Steps taken to reach 1: 8

Answer

```
n,steps=int(input()),0
while n!=1:
    n=n//2 if n%2==0 else 3*n+1
    steps+=1
    if steps>100:
        print("Exceeded 100 steps.Exiting...")
        break
else:
    print(f"Steps taken to reach 1:{steps}")
```

Status : Correct   *Marks : 10/10*

2. Problem Statement

As a software engineer, your goal is to develop a program that facilitates the identification of leap years in a specified range. Your task is to create a program that takes two integer inputs, representing the start and end years of the range and then prints all the leap years within that range.

Input Format

The first line of the input consists of an integer, which represents the start year.

The second line consists of an integer, which represents the end year.

Output Format

The output displays the leap years within the given range, separated by lines.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 2000
2053
Output: 2000
2004
2008
2012
2016
2020
2024
2028
2032
2036
2040
2044
2048
2052

Answer

```
s=int(input())
e=int(input())
for y in range(s,e+1):
    if y%4==0 and (y%100 !=0 or y%400==0):
        print(y)
```

Status : Correct   ***Marks : 10/10***

3. Problem Statement

Sophia, a primary school teacher, wants to calculate the sum of numbers within a given range, excluding those that are multiples of 3.

Write a program to help Sophia compute the sum of all numbers between start and end (inclusive) that are not divisible by 3 using the continue statement.

Input Format

The first line of input consists of an integer, representing the starting number of the range.

The second line of input consists of an integer, representing the ending number of the range.

Output Format

The output prints a single integer, representing the sum of numbers in the range that are not multiples of 3.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 1
10
Output: 37

Answer

```
start=int(input())
end=int(input())
total=sum(i for i in range(start,end+1)if i % 3!=0)
print(total)
```

Status : Correct   *Marks : 10/10*

4. Problem Statement

Kamali recently received her electricity bill and wants to calculate the

amount she needs to pay based on her usage. The electricity company charges different rates based on the number of units consumed.

For the first 100 units, there is no charge. For units consumed beyond 100 and up to 200, there is a charge of Rs. 5 per unit. For units consumed beyond 200, there is a charge of Rs. 10 per unit.

Write a program to help Kamali calculate the amount she needs to pay for her electricity bill based on the units consumed.

Input Format

The input consists of an integer, representing the number of units.

Output Format

The output prints the total amount of the electricity bill, an integer indicating the amount Kamali needs to pay in the format "Rs. amount".

Refer to the sample output for the exact format.

Sample Test Case

Input: 350
Output: Rs. 2000

Answer

```python
def bill(units):
    if units<=100:
        return 0
    elif units<=200:
        return (units-100)*5
    else:
        return (100*5)+(units-200)*10
units=int(input())
print("Rs. ",bill(units))
```

Status : Correct   *Marks : 10/10*

5. Problem Statement

Imagine being entrusted with the responsibility of creating a program that simulates a math workshop for students. Your task is to develop an interactive program that not only calculates but also showcases the charm of factorial values.Your program should efficiently compute and present the sum of digits for factorial values of only odd numbers within a designated range. This approach will ingeniously keep even factorials at bay, allowing students to delve into the intriguing world of mathematics with enthusiasm and clarity.

Input Format

The input consists of a single integer, n.

Output Format

The output displays the factorial and sum of digits of the factorial of odd numbers within the given range.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 6
Output: 1! = 1, sum of digits = 1
3! = 6, sum of digits = 6
5! = 120, sum of digits = 3

Answer

```
import math
n=int(input())
for i in range(1,n+1,2):
    fact=math.factorial(i)
    digit=sum(int(digit) for digit in str(fact))
    print(f"{i}! = {fact},sum of digits = {digit}")
```

Status : Correct   *Marks : 10/10*

6. Problem Statement

Aarav is fascinated by the concept of summing numbers separately based on their properties. He plans to write a program that calculates the sum of even numbers and odd numbers separately from 1 to a given positive integer.

Aarav wants to input an integer value to represent the upper limit of the range. Help Aarav by developing a program that computes and displays the sum of even and odd numbers separately.

Input Format

The input consists of a single integer N, where N is the upper limit of the range.

Output Format

The output consists of two lines:

- The first line displays the sum of even numbers from 1 to N.
- The second line displays the sum of odd numbers from 1 to N.

Refer to the sample output for the exact format.

Sample Test Case

Input: 10
Output: Sum of even numbers from 1 to 10 is 30
Sum of odd numbers from 1 to 10 is 25

Answer

```python
N=int(input())
evens=sum(i for i in range(2,N+1,2))
odds=sum(i for i in range(1,N+1,2))
print(f"Sum of even numbers from 1 to {N} is {evens}")
print(f"Sum of odd numbers from 1 to {N} is {odds}")
```

Status : Correct   *Marks : 10/10*

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NeoColab_REC_CS23221_Python Programming

REC_Python_Week 2_CY

Attempt : 1
Total Mark : 40
Marks Obtained : 30

Section 1 : Coding

1. Problem Statement

Max is fascinated by prime numbers and the Fibonacci sequence. He wants to combine these two interests by creating a program that outputs the first n prime numbers within the Fibonacci sequence.

Your task is to help Max by writing a program that prints the first n prime numbers in the Fibonacci sequence using a while loop along with the break statement to achieve the desired functionality.

Input Format

The input consists of an integer n, representing the number of prime Fibonacci numbers to generate.

Output Format

The output displays space-separated first n prime numbers found in the Fibonacci sequence.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 5
Output: 2 3 5 13 89

Answer

```python
def is_prime(num):
    if num<2:
        return False
    for i in range(2,int(num**0.5)+1):
        if num%i==0:
            return False
    return True
def fibonacci_primes(n):
    a,b=0,1
    primes=[]
    while len(primes)<n:
        if is_prime(a):
            primes.append(a)
        a,b=b,a+b
    print(*primes)
n=int(input())
fibonacci_primes(n)
```

Status : Correct   *Marks : 10/10*

2. Problem Statement

John is tasked with configuring the lighting for a high-profile event, where different lighting modes affect the ambiance of the venue. He can choose from three distinct lighting modes, each requiring a specific adjustment to the initial light intensity:

Ambient Lighting (Mode 1): The intensity level is multiplied by 1.5.Stage Lighting (Mode 2): The intensity level is multiplied by 2.0.Spotlight (Mode 3): The intensity level is multiplied by 1.8.

In the event that an invalid mode is provided, the program should output an error message indicating the invalid selection.

Your task is to write a program that reads the selected lighting mode and the initial intensity level, applies the appropriate adjustment, and prints the final intensity.

Input Format

The first line of input is an integer n, representing the lighting mode.

The second line is a floating value m, representing the initial intensity level of the light.

Output Format

The output displays "Intensity: " followed by a float representing the adjusted intensity level, formatted to two decimal places, if the mode is valid.

If the mode is invalid, the output should display "Invalid".

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 1
10.0
Output: Intensity: 15.00

Answer

```
def configure_lightening(mode,intensity):
    if mode == 1:
        return intensity * 1.50
    elif mode == 2:
        return intensity * 2.00
    elif mode == 3:
        return intensity * 1.80
```

```
    else:
        return "Invalid mode"
mode = int(input())
intensity = float(input())
result = configure_lightening(mode,intensity)
if isinstance(result, str):
    print(result)
else:
    print("Intensity:",result)
```

Status : Wrong   *Marks : 0/10*

3. Problem Statement

Nisha is a mathematics enthusiast, eager to explore the realm of twin prime numbers. The objective is to develop a program that enables the discovery and presentation of twin prime pairs.

The program should take an integer 'n' as input and generate 'n' pairs of twin primes, displaying the pairs with a difference of 2 between them.

Input Format

The input consists of a single integer, n.

Output Format

The output displays the 'n' pairs of twin primes, the pairs with a difference of 2 between them.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 5
Output: 3 5
5 7
11 13

17 19
29 31

Answer

```
def is_prime(n):
    return n>1 and all(n%i for i in range(2,int(n**0.5)+1))
n,count,num=int(input()),0,3
while count<n:
    if is_prime(num) and is_prime(num+2):
        print(num,num+2)
        count+=1
    num+=2
```

Status : Correct   *Marks : 10/10*

4. Problem Statement

Taylor is tasked with a mathematical challenge that requires finding the smallest positive number divisible by all integers from 1 to n.

Help Taylor to determine the smallest positive number that is divisible by all integers from 1 to n. Make sure to employ the break statement to ensure efficiency in the program.

Input Format

The input consists of a single integer, n.

Output Format

The output displays the smallest positive number that is divisible by all integers from 1 to n.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 10
Output: 2520

Answer

```
import math
n=int(input())
lcm=1
for i in range(2,n+1):
    lcm=(lcm*i)//math.gcd(lcm,i)
print(lcm)
```

Status : Correct   *Marks : 10/10*

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NeoColab_REC_CS23221_Python Programming

REC_Python_Week 3_MCQ

Attempt : 1
Total Mark : 25
Marks Obtained : 24

Section 1 : MCQ

1. What does the append() method do in Python?

Answer

Adds a new element to the end of the list

Status : Correct   *Marks : 1/1*

2. What will be the output of the following code?

```
my_list = [1, 2, 2, 3]
print(my_list.count(2))
```

Answer

2

Status : Correct   *Marks : 1/1*

3. What is the output of the following Python code?

```
text = "Python"
result = text.center(10, "*")
print(result)
```

Answer

Python

Status : Correct   *Marks : 1/1*

4. What is the output of the following Python code?

```
word = "Python"
result = word[::-1]
print(result)
```

Answer

nohtyP

Status : Correct   *Marks : 1/1*

5. What is the output of the following code?

```
my_list = [1, 2, 3]
my_list *= 2
print(len(my_list))
```

Answer

6

Status : Correct   *Marks : 1/1*

6. What is the output of the following Python code?

```
word = "programming"
answer = word.index("gram")
print(answer)
```

Answer

5

Status : Wrong   *Marks : 0/1*

7.   What is the output of the following Python code?

```
b = "Projects!"
print(b[2:5])
```

Answer

oje

Status : Correct   *Marks : 1/1*

8.   What is the result of the slicing operation lst[-5:-2] on the list lst = [1, 2, 3, 4, 5, 6]?

Answer

[2, 3, 4]

Status : Correct   *Marks : 1/1*

9. Which method in Python is used to create an empty list?

Answer

list()

Status : Correct   *Marks : 1/1*

10.   What is the output of the following Python code?

```
txt = "My Classroom"
print(txt.find("o"))
print(txt.index("o"))
```

Answer

99

Status : Correct   *Marks : 1/1*

11.   Suppose list1 is [2, 33, 222, 14, 25], What is list1[:-1]?

Answer

[2, 33, 222, 14]

Status : Correct   *Marks : 1/1*

12.   What does the following code output?

lst = [10, 20, 30, 40, 50]
print(lst[-4:-1])

Answer

[20, 30, 40]

Status : Correct   *Marks : 1/1*

13.   What will be the output of the following code?

numbers = [1, 2, 3, 4, 5]
numbers.remove(6)
print(numbers)

Answer

ValueError: list.remove(x): x not in list

Status : Correct   *Marks : 1/1*

14.   What will be the output of the following program?

numbers = [1, 2, 3, 4, 5]
numbers.append(6, 7)
print(numbers)

Answer

Compile Time Error

Status : Correct   *Marks : 1/1*

15. Suppose list1 is [2, 33, 222, 14, 25], What is list1[-1]?

Answer

25

Status : Correct   *Marks : 1/1*

16. What is the output of the following code?

```
my_list = [3, 6, 1, 2, 5, 4]
print(sorted(my_list) == my_list.sort())
```

Answer

False

Status : Correct   *Marks : 1/1*

17. Which of the following is a valid way to use the '%' operator to concatenate strings in Python?

Answer

"%s %s" % (string1, string2)

Status : Correct   *Marks : 1/1*

18. What is the output of the following Python code?

```
name = "John"
age = 25
message = "My name is %s and I am %d years old." % (name, age)
print(message)
```

Answer

My name is John and I am 25 years old.

Status : Correct   *Marks : 1/1*

19.   What is the output of the following Python code?

```
a = "Hello"
b = "World"
c = a + " " + b
print(c)
```

Answer

Hello World

Status : Correct   *Marks : 1/1*

20.   What is the output of the following Python code?

```
text = "   Python   "
answer = text.strip()
print(answer)
```

Answer

Python

Status : Correct   *Marks : 1/1*

21.   Which method is used to add multiple items to the end of a list?

Answer

extend()

Status : Correct   *Marks : 1/1*

22.   Suppose list1 is [4, 2, 2, 4, 5, 2, 1, 0], Which of the following is the correct syntax for slicing operation?

Answer

all of the mentioned options

23.   What is the output of the following Python code?

```
string1 = "Hello"
string2 = "World"
result = string1 + string2
print(result)
```

Answer

HelloWorld

Status : Correct   *Marks : 1/1*

24.   What does negative indexing in Python lists allow you to do?

Answer

Access elements in the list from the end

Status : Correct   *Marks : 1/1*

25.   If you have a list lst = [1, 2, 3, 4, 5, 6], what does the slicing operation lst[-3:] return?

Answer

The last three elements of the list

Status : Correct   *Marks : 1/1*

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NeoColab_REC_CS23221_Python Programming

REC_Python_Week 3_COD

Attempt : 1
Total Mark : 50
Marks Obtained : 50

Section 1 : Coding

1. Problem Statement

Ram is working on a program to manipulate strings. He wants to create a program that takes two strings as input, reverses the second string, and then concatenates it with the first string.

Ram needs your help to design a program.

Input Format

The input consists of two strings in separate lines.

Output Format

The output displays a single line containing the concatenated string of the first string and the reversed second string.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: hello
word
Output: hellodrow

Answer

```
a=input()
b=input()
print(a,b[::-1])
```

Status : Correct   *Marks : 10/10*

2. Problem Statement

You have a string containing a phone number in the format "(XXX) XXX-XXXX". You need to extract the area code from the phone number and create a new string that contains only the area code.

Write a Python program for the same.

Note

(XXX) - Area code

XXX-XXXX - Phone number

Input Format

The input consists of a string, representing the phone number in the format "(XXX) XXX-XXXX".

Output Format

The output displays "Area code: " followed by a string representing the area code for the given phone number.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: (123) 456-7890
Output: Area code: 123

Answer

```
s=input()
print("Area code:",s[1:4])
```

Status : Correct   *Marks : 10/10*

3.   Problem Statement

Dhruv wants to write a program to slice a given string based on user-defined start and end positions.

The program should check whether the provided positions are valid and then return the sliced portion of the string if the positions are within the string's length.

Input Format

The first line consists of the input string as a string.

The second line consists of the start position (0-based index) as an integer.

The third line consists of the end position (0-based index) as an integer.

Output Format

The output displays the following format:

If the start and end positions are valid, print the sliced string.

If the start and end positions are invalid, print "Invalid start and end positions".

Refer to the sample output for formatting specifications.

Sample Test Case

Input: pythonprogramming
0
5
Output: python

Answer

```
s=input()
st=int(input())
end=int(input())
if(st>end or st<0 or end<0 or end>=len(s)):
    print("Invalid start and end positions")
    exit()

print(s[st:end+1])
```

Status : Correct   *Marks : 10/10*

4. Problem Statement

Given a list of positive and negative numbers, arrange them such that all negative integers appear before all the positive integers in the array. The order of appearance should be maintained.

Example

Input:

[12, 11, -13, -5, 6, -7, 5, -3, -6]

Output:

List = [-13, -5, -7, -3, -6, 12, 11, 6, 5]

Explanation:

The output is the arranged list where all the negative integers appear before the positive integers while maintaining the original order of appearance.

Input Format

The input consists of a single line containing a list of integers enclosed in square brackets separated by commas.

Output Format

The output displays "List = " followed by an arranged list of integers as required, separated by commas and enclosed in square brackets.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: [12, 11, -13, -5, 6, -7, 5, -3, -6]
Output: List = [-13, -5, -7, -3, -6, 12, 11, 6, 5]

Answer

```python
my_list=eval(input())
l=len(my_list)

nw=[]

for i in my_list:
    if i<0:
        nw.append(i)

for i in my_list:
    if i>=0:
        nw.append(i)

print("List = ",nw)
```

Status : Correct   *Marks : 10/10*

5. Problem Statement

Alex is working on a Python program to manage a list of elements. He needs to append multiple elements to the list and then remove an element

from the list at a specified index.

Your task is to create a program that helps Alex manage the list. The program should allow Alex to input a list of elements, append them to the existing list, and then remove an element at a specified index.

Input Format

The first line contains an integer n, representing the number of elements to be appended to the list.

The next n lines contain integers, representing the elements to be appended to the list.

The third line of input consists of an integer M, representing the index of the element to be popped from the list.

Output Format

The first line of output displays the original list.

The second line of output displays the list after popping the element of the index M.

The third line of output displays the popped element.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 5
64
98
-1
5
26
3
Output: List after appending elements: [64, 98, -1, 5, 26]
List after popping last element: [64, 98, -1, 26]
Popped element: 5

Answer

```
n=int(input())
my_list=[]
for i in range(n):
    my_list.append(int(input()))
p=int(input())
print(f"List after appending elements: {my_list}")
dee=my_list.pop(p)
print(f"List after popping last element: {my_list}\nPopped element: {dee}")
```

Status : Correct   *Marks : 10/10*

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NeoColab_REC_CS23221_Python Programming

REC_Python_Week 3_PAH

Attempt : 1
Total Mark : 60
Marks Obtained : 60

Section 1 : Coding

1. Problem Statement

Gowri was doing her homework. She needed to write a paragraph about modern history. During that time, she noticed that some words were repeated repeatedly. She started counting the number of times a particular word was repeated.

Your task is to help Gowri to write a program to get a string from the user. Count the number of times a word is repeated in the string.

Note: Case-sensitive

Input Format

The first line of input consists of a string, str1.

The second line consists of a single word that needs to be counted, str2.

Output Format

The output displays the number of times the given word is in the string.

If the second string str2 is not present in the first string str1, it prints 0.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: I felt happy because I saw the others were happy and because I knew I should feel happy

happy

Output: 3

Answer

```
import re

s1=input().strip()
s2=input().strip()
s1=re.sub(r'[^\w\s]','',s1)
cnt=s1.split().count(s2)
print(cnt)
```

Status : Correct   *Marks : 10/10*

2. Problem Statement

Neha is learning string operations in Python and wants to practice using built-in functions. She is given a string A, and her task is to:

Find the length of the string using a built-in function.Copy the content of A into another string B using built-in functionality.

Help Neha implement a program that efficiently performs these operations.

Input Format

The input consists of a single line containing the string A (without spaces).

Output Format

The first line of output prints the length of the given string.

The second line prints the copied string without an extra newline at the end.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: technology-23
Output: Length of the string: 13
Copied string: technology-23

Answer

```
st1=input()
print("Length of the string:",len(st1))
st2=st1
print(f"Copied string: {st2}")
```

Status : Correct   *Marks : 10/10*

3. Problem Statement

Accept an unsorted list of length n with both positive and negative integers, including 0. The task is to find the smallest positive number missing from the array. Assume the n value is always greater than zero.

Input Format

The first line consists of n, which means the number of elements in the array.

The second line consists of the values in the list as space-separated integers.

Output Format

The output displays the smallest positive number, which is missing from the array.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 6
-5 2 0 -1 -10 2
Output: 1

Answer

```
n=int(input())
lst=list(map(int,input().split()))

pre=[False]*(n+2)

for i in range(n):
    if 1<=lst[i]<=n:
        pre[lst[i]]=True

for i in range(1,n+2):
    if not pre[i]:
        print(i)
        break
```

Status : Correct   *Marks : 10/10*

4. Problem Statement

You are tasked with writing a program that takes n integers as input from the user and stores them in a list. After this, you need to transform the list according to the following rules:

The element at index 0 should be replaced with 0.For elements at even indices (excluding index 0), replace the element with its cube.For elements at odd indices, replace the element with its square.

Additionally, you should sort the list in ascending order before applying these transformations.

Input Format

The first line of input represents the size of the list, N.

The elements of the list are represented by the next N lines.

Output Format

The first line of output displays "Original List: " followed by the original list.

The second line displays "Replaced List: " followed by the replacement list as per the given condition.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 5
5
1
2
3
4
Output: Original List: [1, 2, 3, 4, 5]
Replaced List: [0, 4, 27, 16, 125]

Answer

```python
n=int(input())

ele=[]
for _ in range(n):
    ele.append(int(input()))

org=sorted(ele)

rep=[]
for i in range(n):
    if i==0:
        rep.append(0)
    elif i%2==0:
        rep.append(org[i]**3)
```

```
    else:
        rep.append(org[i]**2)

print("Original List:",org)
print("Replaced List:",rep)
```

Status : Correct   *Marks : 10/10*

5. Problem Statement

Imagine you are developing a text analysis tool for a cybersecurity company. Your task is to analyze input strings to categorize and count the characters into four categories: uppercase letters, lowercase letters, digits, and special characters. The company needs this tool to process log files and identify potential security threats.

Input Format

The input consists of the log entry provided as a single string.

Output Format

The output consists of four lines:

The first line contains an integer representing the count of uppercase letters in the format "Uppercase letters: {uppercase count}".

The second line contains an integer representing the count of lowercase letters in the format "Lowercase letters: {lowercase count}".

The third line contains an integer representing the count of digits in the format "Digits: {digits count}".

The fourth line contains an integer representing the count of special characters in the format "Special characters: {special characters count}".

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: Hello123
Output: Uppercase letters: 1
Lowercase letters: 4
Digits: 3
Special characters: 0

Answer

```
st=input()

upc=0
lc=0
dc=0
sc=0

for char in st:
    if char.isupper():
        upc+=1
    elif char.islower():
        lc+=1
    elif char.isdigit():
        dc+=1
    else:
        sc+=1

print(f"Uppercase letters: {upc}")
print(f"Lowercase letters: {lc}")
print(f"Digits: {dc}")
print(f"Special characters: {sc}")
```

Status : Correct   *Marks : 10/10*

6. Problem Statement

Kyara is analyzing a series of measurements taken over time. She needs to identify all the "peaks" in this list of integers.

A peak is defined as an element that is greater than its immediate neighbors. Boundary elements are considered peaks if they are greater than their single neighbor.

Your task is to find and list all such peaks using list comprehension.

Example

Input

1 3 2 4 1 5 7 6 10 2 8

Output

Peaks: [3, 4, 7, 10, 8]

Explanation

3 is a peak because it's greater than 1 and 2.

4 is a peak because it's greater than 2 and 1.

7 is a peak because it's greater than 5 and 6.

10 is a peak because it's greater than 6 and 2.

8 is a peak because it is an boundary element and it is greater than 2.

Input Format

The input consists of several integers separated by spaces, representing the measurements.

Output Format

The output displays "Peaks: " followed by a list of integers, representing the peak elements in the list.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 1 3 2 4 1 5 7 6 10 2 8
Output: Peaks: [3, 4, 7, 10, 8]

Answer

arr=list(map(int,input().split()))

```python
n=len(arr)

pks=[
    arr[i] for i in range(len(arr))
    if (i==0 and arr[i]>arr[i+1]) or (i==n-1 and arr[i]>arr[i-1]) or
    (0<i<n-1 and arr[i]>arr[i-1] and arr[i]>arr[i+1])
    ]

print("Peaks:",pks)
```

Status : Correct   *Marks : 10/10*

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NeoColab_REC_CS23221_Python Programming

REC_Python_Week 3_CY

Attempt : 1
Total Mark : 30
Marks Obtained : 30

Section 1 : Coding

1. Problem Statement

Write a program to check if a given string is perfect.

A perfect string must satisfy the following conditions:

The string starts with a consonant.The string alternates between consonants and vowels.Each consonant appears exactly once.Vowels can occur consecutively multiple times but should not be followed immediately by a consonant.

If the string satisfies all these conditions, print "True"; otherwise, print "False".

Input Format

The input consists of a string.

Output Format

The output prints "True" if the string is perfect. Otherwise, print "False".

Refer to the sample output for formatting specifications.

Sample Test Case

Input: capacitor
Output: True

Answer

```
def ips(s):
    vow=set('aeiou')

    if not s or s[0] in vow:
        return False

    n=len(s)
    for i in range(1,n):
        if s[i] not in vow and s[i-1] not in vow:
            return False

    return True

s=input().strip()

print("True" if ips(s) else "False")
```

Status : Correct   *Marks : 10/10*

2. Problem Statement

Raj wants to write a program that takes a list of strings as input and returns the longest word in the list. If there are multiple words with the same length, the program should return the first one encountered.

Help Raj in his task.

Input Format

The input consists of a single line of space-separated strings.

Output Format

The output prints a string representing the longest word in the given list.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: cat dog elephant lion tiger giraffe
Output: elephant

Answer

```
words=input().split()
longest_word = ""
for word in words:
    if len(word) > len(longest_word):
        longest_word = word
print(longest_word)
```

Status : Correct   *Marks : 10/10*

3.   Problem Statement

Sarah is a technical writer who is responsible for formatting two important documents. Both documents contain a certain placeholder character that needs to be replaced with another character before they can be finalized. To ensure consistency in formatting, Sarah wants you to help her write a program that processes both documents by replacing the placeholder character with the new one.

Sarah also prefers a neat and structured output, so she wants you to ensure that both modified documents are printed in a single line, separated by a space, using the format() function.

Example

Input:

Hello

World

o

a

Output:

Hella Warld

Explanation:

Here the character 'o' is replaced with 'a' in the concatenated string.

Input Format

The first line contains string1, the first document.

The second line contains string2, the second document.

The third line contains char1, the placeholder character that needs to be replaced.

The fourth line contains char2, the new character that will replace the placeholder.

Output Format

The output displays a single line containing the modified string1 and string2, separated by a space.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: Hello
World
o
a
Output: Hella Warld

Answer

```
s1=input()
s2=input()
c1=input()
c2=input()

str1=s1.replace(c1,c2)
str2=s2.replace(c1,c2)

print("{} {}".format(str1,str2))
```

Status : Correct   *Marks : 10/10*

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NeoColab_REC_CS23221_Python Programming

REC_Python_Week 4_MCQ

Attempt : 1
Total Mark : 15
Marks Obtained : 14

Section 1 : MCQ

1. What is the output of the following code snippet?

```
def square(x):
    return x ** 2

result = square(4)
print(result)
```

Answer

16

Status : Correct   *Marks : 1/1*

2. What will be the output of the following Python code?

```
def cube(x):
  return x * x * x
x = cube(3)
print(x)
```

Answer

27

Status : Correct   *Marks : 1/1*

3. What keyword is used to define a lambda function in Python?

Answer

lambda

Status : Correct   *Marks : 1/1*

4. What is the output of the code shown?

```
def f1():
 global x
 x+=1
 print(x)
x=12
print("x")
```

Answer

x

Status : Correct   *Marks : 1/1*

5. What will be the output of the following Python code?

```
def display(b, n):
   while n > 0:
     print(b,end="")
     n=n-1
display('z',3)
```

Answer

zzz

Status : Correct   *Marks : 1/1*

6. What is the output of the following code snippet?

```python
def my_function(x):
    x += 5
    return x

a = 10
result = my_function(a)
print(a, result)
```

Answer

10 15

Status : Correct   *Marks : 1/1*

7. What is the main advantage of using lambda functions in Python?

Answer

They allow you to write shorter code than regular functions

Status : Correct   *Marks : 1/1*

8. What is the output of the following code snippet?

```python
def add(a, b=2):
    return a - b

result = add(3)
print(result)
```

Answer

1

Status : Correct   *Marks : 1/1*

9. What will be the output of the following code?

```
num1 = 10
num2 = -10
result = abs(num1) + abs(num2)
print(result)
```

Answer

20

Status : Correct   *Marks : 1/1*

10. What is the output of the code shown below?

```
def f1(x):
    x += 1
    print(x)

global_variable = 15
f1(global_variable)
print("hello")
```

Answer

16hello

Status : Correct   *Marks : 1/1*

11. What is the output of the code shown?

```
def f():
 global a
 print(a)
 a = "hello"
 print(a)
a = "world"
f()
print(a)
```

Answer

worldhellohello

12.   What will be the output of the following Python code?

```
def C2F(c):
    return c * 9/5 + 32
print(C2F(100))
print(C2F(0))
```

Answer

212.032.0

13.   What will be the output of the following code?

```
number = 7
result = abs(number) + pow(number, 2)
print(result)
```

Answer

56

14.   What will be the output of the following Python code?

```
def func(a, b=5, c=10):
    print('a is', a, 'and b is', b, 'and c is', c)

func(3, 7)
func(25, c = 24)
func(c = 50, a = 100)
```

Answer

a is 3 and b is 7 and c is 10a is 25 and b is 5 and c is 24a is 100 and b is 5 and c is 50

15. What is the output of the following code?

```
x=12
def f1(a,b=x):
 print(a,b)
x=15
f1(4)
```

Answer

4 15

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NeoColab_REC_CS23221_Python Programming

REC_Python_Week 4_COD_Updated

Attempt : 1
Total Mark : 50
Marks Obtained : 50

Section 1 : Coding

1. Problem Statement

Sneha is building a more advanced exponential calculator. She wants to implement a program that does the following:

Calculates the result of raising a given base to a specific exponent using Python's built-in pow() function.Displays all intermediate powers from base^1 to base^exponent as a list.Calculates and displays the sum of these intermediate powers.

Help her build this program to automate her calculations.

Input Format

The input consists of line-separated two integer values representing base and exponent.

Output Format

The first line of the output prints the calculated result of raising the base to the exponent.

The second line prints a list of all powers from base^1 to base^exponent.

The third line prints the sum of all these powers.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 2
3
Output: 8
[2, 4, 8]
14

Answer

```python
# You are using Python
b=int(input())
c=int(input())
s=0
print(pow(b,c))
lis=[]
for i in range(1,c+1):
    lis.append(pow(b,i))
print(lis)
s=sum(i for i in lis )
print(s)
```

Status : Correct   *Marks : 10/10*

2. Problem Statement

Sara is developing a text-processing tool that checks if a given string starts with a specific character or substring. She needs to implement a function that accepts a string and a character (or substring), and returns True if the

string starts with the provided character/substring, or False otherwise.

Write a program that uses a lambda function to help Sara perform this check.

Input Format

The first line contains a string `str` representing the main string to be checked.

The second line contains a string `n`, which is the character or substring to check if the main string starts with it.

Output Format

The first line of output prints "True" if the string starts with the given character/substring, otherwise prints "False".

Refer to the sample for the formatting specifications.

Sample Test Case

Input: Examly
e
Output: False

Answer

```
# You are using Python
str1=input()
n=input()
ans=lambda str1,n:str1.startswith(n)
print(ans(str1,n))
```

Status : Correct   *Marks : 10/10*

3. Problem Statement

Imagine you are developing a text analysis tool for a cybersecurity company. Your task is to create a function that analyzes input strings to categorize and count the characters into four categories: uppercase

letters, lowercase letters, digits, and special characters. The company needs this tool to process log files and identify potential security threats.

Function Signature: analyze_string(input_string)

Input Format

The input consists of a single string (without space), which may include uppercase letters, lowercase letters, digits, and special characters.

Output Format

The first line contains an integer representing the count of uppercase letters in the format "Uppercase letters: [count]".

The second line contains an integer representing the count of lowercase letters in the format "Lowercase letters: [count]".

The third line contains an integer representing the count of digits in the format "Digits: [count]".

The fourth line contains an integer representing the count of special characters in the format "Special characters: [count]".

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: Hello123

Output: Uppercase letters: 1
Lowercase letters: 4
Digits: 3
Special characters: 0

Answer

def analyze_string(input_string):

    uppercase_count=0
    lowercase_count=0
    digit_count=0

```
    special_count=0

    for i in input_string:
        if (i.isupper()):
            uppercase_count+=1
        elif (i.islower()):
            lowercase_count+=1
        elif (i.isdigit()):
            digit_count+=1
        else:
            special_count+=1

    return(uppercase_count,lowercase_count,digit_count,special_count)


input_string = input()
uppercase_count, lowercase_count, digit_count, special_count =
analyze_string(input_string)

print("Uppercase letters:", uppercase_count)
print("Lowercase letters:", lowercase_count)
print("Digits:", digit_count)
print("Special characters:", special_count)
```

Status : Correct   *Marks : 10/10*

4. Problem Statement

Imagine you are building a messaging application, and you want to know
the length of the messages sent by the users. You need to create a
program that calculates the length of a message using the built-in function
len().

Input Format

The input consists of a string representing the message.

Output Format

The output prints an integer representing the length of the entered message.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: hello!!
Output: 7

Answer

```python
# You are using Python
s=input()
print(len(s))
```

Status : Correct   *Marks : 10/10*

5. Problem Statement

Implement a program that needs to identify Armstrong numbers.
Armstrong numbers are special numbers that are equal to the sum of their
digits, each raised to the power of the number of digits in the number.

Write a function is_armstrong_number(number) that checks if a given
number is an Armstrong number or not.

Function Signature: armstrong_number(number)

Input Format

The first line of the input consists of a single integer, n, representing the number
to be checked.

Output Format

The output should consist of a single line that displays a message indicating
whether the input number is an Armstrong number or not.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 153
Output: 153 is an Armstrong number.

Answer

```
s=input()
l=len(s)
rm=0
for i in s:
    rm=rm+pow(int(i),l)
if(rm==int(s)):
    print(f"{s} is an Armstrong number.")
else:
    print(f"{s} is not an Armstrong number.")
```

Status : Correct   *Marks : 10/10*

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NeoColab_REC_CS23221_Python Programming

REC_Python_Week 4_PAH_Updated

Attempt : 1
Total Mark : 60
Marks Obtained : 60

Section 1 : Coding

1. Problem Statement

Create a Python program to monitor temperatures in a greenhouse using two sensors. Calculate and display the absolute temperature difference between the two sensor readings to ensure proper temperature control.

Note: Use the abs() built-in function.

Input Format

The first line consists of a floating-point number, representing the temperature reading from Sensor 1.

The second line consists of a floating-point number, representing the temperature reading from Sensor 2.

Output Format

The output displays the absolute temperature difference between Sensor 1 and Sensor 2, rounded to two decimal places.

Refer to the sample output for the exact format.

Sample Test Case

Input: 33.2
26.7
Output: Temperature difference: 6.50 °C

Answer

```python
# You are using Python
i=float(input())
j=float(input())
d=abs(i-j)
print(f"temperature difference: {d:.2f}{chr(176)}c")
```

Status : Correct   *Marks : 10/10*

2.   Problem Statement

Hussain wants to create a program to calculate a person's BMI (Body Mass Index) based on their weight in kilograms and height in meters. The BMI is a measure of a person's body fat relative to their height.

Your program should take user input for weight and height, calculate the BMI, and display the result.

Function Signature: calculate_bmi(weight, height)

Formula: BMI = Weight/(Height)2

Input Format

The first line of input consists of a positive floating-point number, the person's weight in kilograms.

The second line of input consists of a positive floating-point number, the person's height in meters.

Output Format

The output displays "Your BMI is: [BM] followed by a float value representing the calculated BMI, rounded off two decimal points.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 70.0
1.75
Output: Your BMI is: 22.86

Answer

```
weight = float(input())
height = float(input())

# You are using Python
def calculate_bmi(w,h):
    bmi=0.0
    bmi=w/(h**2)
    print(f"Your BMI is:{bmi:.2f}")

calculate_bmi(weight, height)
```

Status : Correct   *Marks : 10/10*

3. Problem Statement

Ella is designing a messaging application that needs to handle long text messages efficiently. To optimize storage and transmission, she plans to implement a text compression feature that replaces consecutive repeated characters with the character followed by its count, while leaving non-repeated characters unchanged.

Help Ella create a recursive function to achieve this compression without altering the original message's meaning.

Function Specification: def compress_string(*args)

Input Format

The input consists of a single line containing the string to be compressed.

Output Format

The output consists of a single line containing the compressed string.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: aaaBBBccc
Output: a3B3c3

Answer

```python
# You are using Python
def compress_string(s):
    s1=" "
    c=1
    for i in range(1,len(s)):
        if s[i]==s[i-1]:
            c+=1
        else:
            s1+=s[i-1]
            if c>1:
                s1+=str(c)
            c=1
    s1 += s[-1]
    if c>1:
        s1+=str(c)
    return s1
s=input()
print(compress_string(s))
```

Status : Correct   *Marks : 10/10*

4. Problem Statement

Alice works at a digital marketing company, where she analyzes large datasets. One day, she's tasked with processing customer ID numbers, which are long numeric sequences.

To simplify her task, Alice needs to calculate the digital root of each ID. The digital root is obtained by repeatedly summing the digits of a number until a single digit remains.

Help Alice write a program that reads a customer ID number, calculates its digital root, and prints the result using a loop-based approach.

For example, the sum of the digits of 98675 is 9 + 8 + 6 + 7 + 5 = 35, then 3 + 5 = 8, which is the digital root.

Function prototype: def digital_root(num)

Input Format

The input consists of an integer num.

Output Format

The output prints an integer representing the sum of digits for a given number until a single digit is obtained.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 451110
Output: 3

Answer

```
num = int(input())
# You are using Python
def digital_root(n):
    s=str(n)
```

```
    rm=rm1=0
    for i in s:
        rm=rm+int(i)
    s1 = str(rm)
    for i in s1:
        rm1=rm1+int(i)
    return rm1

print(digital_root(num))
```

Status : Correct   *Marks : 10/10*

5. Problem Statement

Ravi is working on analyzing a set of integers to determine how many of
them are divisible by 3 and how many are divisible by 5. He decides to use
lambda functions to filter and count the numbers based on their divisibility.

Write a program that takes a list of integers, calculates how many numbers
are divisible by 3, and how many are divisible by 5, and then prints the
results.

Additionally, the program should calculate the total sum of all numbers
divisible by 3 and divisible by 5 separately.

Input Format

The first line contains an integer n, representing the number of integers in the
list.

The second line contains n space-separated integers.

Output Format

The first line should print the count of numbers divisible by 3.

The second line should print the count of numbers divisible by 5.

The third line should print the sum of numbers divisible by 3.

The fourth line should print the sum of numbers divisible by 5.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 6
3 5 6 10 15 20

Output: 3
4
24
50

Answer

```python
# You are using Python
n=int(input())
x=input()
l=list(map(int,x.split()))
div3=list(filter(lambda x:x%3==0,l))
div5=list(filter(lambda x:x%5==0,l))
print(len(div3))
print(len(div5))
print(sum(div3))
print(sum(div5))
```

Status : Correct   *Marks : 10/10*

6. Problem Statement

Sophia is developing a feature for her online banking application that calculates the total sum of digits in customers' account numbers. This sum is used to generate unique verification codes for secure transactions. She needs a program that takes an account number as input and outputs the sum of its digits.

Help Sophia to complete her task.

Function Specification: def sum_digits(num)

Input Format

The input consists of an integer, representing the customer's account number.

Output Format

The output prints an integer representing the sum of the digits of the account number.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 123245
Output: 17

Answer

num = int(input())

You are using Pytho

def sum_digits(n):
    s=str(n)
    rm=0
    for i in s:
        rm=rm+int(i)
    return rm

sum = sum_digits(num)
print(sum)

Status : Correct   *Marks : 10/10*

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NeoColab_REC_CS23221_Python Programming

REC_Python_Week 4_CY

Attempt : 1
Total Mark : 40
Marks Obtained : 40

Section 1 : Coding

1. Problem Statement

Create a program for a mathematics competition where participants need to find the smallest positive divisor of a given integer n. Your program should efficiently determine this divisor using the min() function and display the result.

Input Format

The input consists of a single positive integer n, representing the number for which the smallest positive divisor needs to be found.

Output Format

The output prints the smallest positive divisor of the input integer in the format:
"The smallest positive divisor of [n] is: [smallest divisor]".

Refer to the sample output for the exact format.

Sample Test Case

Input: 24
Output: The smallest positive divisor of 24 is: 2

Answer

```
n=int(input())
smallest_divisor=min(filter(lambda x: n%x == 0,range(2,n+1)))
print(f"The smallest positive divisor of {n} is: {smallest_divisor}")
```

Status : Correct   *Marks : 10/10*

2.   Problem Statement

Meena is analyzing a list of integers and needs to count how many numbers in the list are even and how many are odd. She decides to use lambda functions to filter the even and odd numbers from the list.

Write a program that takes a list of integers, counts the number of even and odd numbers using lambda functions, and prints the results.

Input Format

The first line contains an integer n, representing the number of integers in the list.

The second line contains n space-separated integers.

Output Format

The first line of output prints an integer representing the count of even numbers.

The second line of output prints an integer representing the count of odd numbers.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 7
12 34 56 78 98 65 23
Output: 5
2

Answer

```
# You are using Python
n=int(input())
numbers=list(map(int,input().split()))
e_count=len(list(filter(lambda x: x%2 ==0,numbers)))
o_count=len(list(filter(lambda x: x % 2 != 0,numbers)))
print(e_count)
print(o_count)
```

Status : Correct   *Marks : 10/10*

3. Problem Statement

Imagine you are tasked with developing a function for calculating the total cost of an item after applying a sales tax. The sales tax rate is equal to 0.08 and it is defined as a global variable.

The function should accept the cost of the item as a parameter, calculate the tax amount, and return the total cost.

Additionally, the program should display the item cost, sales tax rate, and total cost to the user.

Function Signature: total_cost(item_cost)

Input Format

The input consists of a single line containing a positive floating-point number representing the cost of the item.

Output Format

The output consists of three lines:

"Item Cost:" followed by the cost of the item formatted to two decimal places.

"Sales Tax Rate:" followed by the sales tax rate in percentage.

"Total Cost:" followed by the calculated total cost after applying the sales tax, formatted to two decimal places.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 50.00
Output: Item Cost: $50.00
Sales Tax Rate: 8.0%
Total Cost: $54.00

Answer

```python
#

# You are using Python
SALES_TAX_RATE=0.08
def total_cost(item_cost):
    """
    Calculates the total cost of an item after applyiong sales tax.
    Args:
        item_cost:The cost of the item.
    Returns:
        The total cost of the item after applyiong sales tax.

    """
    tax_amount=item_cost*SALES_TAX_RATE
    total_cost=item_cost+tax_amount
    return total_cost

if __name__ =="__main__":
    item_cost=float(input())
    final_cost=total_cost(item_cost)

total_cost = total_cost(item_cost)
print(f"Item Cost: ${item_cost:.2f}")
```

```
print(f"Sales Tax Rate: {SALES_TAX_RATE * 100}%")
print(f"Total Cost: ${total_cost:.2f}")
```

Status : Correct   *Marks : 10/10*

4. Problem Statement

You are tasked with designing a shipping cost calculator program that
calculates the shipping cost for packages based on their weight and
destination. The program utilizes different shipping rates for domestic,
international, and remote destinations. The rates for each destination type
are provided as global constants.

Constant Values:

DOMESTIC_RATE = 5.0

INTERNATIONAL_RATE = 10.0

REMOTE_RATE = 15.0

Function Signature: calculate_shipping(weight, destination)

Formula: shipping cost = weight * destination rate

Input Format

The first line of the input consists of a float representing the weight of the
package.

The second line consists of a string representing the destinations(Domestic or
International or Remote).

Output Format

The program outputs any one of the following:

1. If the input is valid and the destination is recognized, the output should
consist of a single line stating the calculated shipping cost for the given weight
and destination in the format: "Shipping cost to [destination] for a [weight] kg
package: $[calculated cost]" with two decimal places.
2. If the input weight is not a positive float, print "Invalid weight. Weight must be

greater than 0."
3. If the input destination is not one of the valid options, print "Invalid destination."

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 5.5
Domestic

Output: Shipping cost to Domestic for a 5.5 kg package: $27.50

Answer

```python
#

DOMESTIC_RATE=5.0
INTERNATIONAL_RATE=10.0
REMOTE_RATE=15.0

def calculate_shipping(weight,destination):

    if weight <0:
        print("Invalid weight.Weight must be greater than 0.")
        return None
    elif destination.lower()=="domestic":
        rate=DOMESTIC_RATE
    elif destination.lower()=="international":
        rate=INTERNATIONAL_RATE
    elif destination.lower()=="remote":
        rate=REMOTE_RATE
    else:
        print("Invalid destination.")
        return None

    return weight*rate
weight=float(input())
destination=input()
shipping_cost=calculate_shipping(weight,destination)
```

```
if shipping_cost is not None:
    print(f"Shipping cost to {destination} for a {weight} kg package:
${shipping_cost:.2f}")
```

Status : Correct   *Marks : 10/10*

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NeoColab_REC_CS23221_Python Programming

REC_Python_Week 5_MCQ

Attempt : 1
Total Mark : 20
Marks Obtained : 19

Section 1 : MCQ

1.   What will be the output for the following code?

```
a=(1,2,3)
b=('A','B','C')
c=zip(a,b)

print(c)
print(tuple(c))
```

Answer

((1, 'A'), (2, 'B'), (3, 'C'))

Status : Correct   *Marks : 1/1*

2.   What will be the output?

```
a={'B':5,'A':9,'C':7}
print(sorted(a))
```

Answer

['A', 'B', 'C'].

Status : Correct   *Marks : 1/1*

3. What will be the output of the following program?

```
set1 = {1, 2, 3}
set2 = set1.copy()
set2.add(4)
print(set1)
```

Answer

{1, 2, 3}

Status : Correct   *Marks : 1/1*

4. Which of the statements about dictionary values is false?

Answer

Values of a dictionary must be unique

Status : Correct   *Marks : 1/1*

5. Which of the following is a Python tuple?

Answer

(1, 2, 3)

Status : Correct   *Marks : 1/1*

6. What is the output of the following code?

```
a={"a":1,"b":2,"c":3}
```

```
b=dict(zip(a.values(),a.keys()))
print(b)
```

Answer

{1: 'a', 2: 'b', 3: 'c'}

Status : Correct   *Marks : 1/1*

7.   What is the output of the following code?

```
a={1:"A",2:"B",3:"C"}
b=a.copy()
b[2]="D"
print(a)
```

Answer

{1: 'A', 2: 'B', 3: 'C'}

Status : Correct   *Marks : 1/1*

8.   What is the output of the following?

```
set1 = {10, 20, 30, 40, 50}
set2 = {60, 70, 10, 30, 40, 80, 20, 50}
print(set1.issubset(set2))
print(set2.issuperset(set1))
```

Answer

TrueTrue

Status : Correct   *Marks : 1/1*

9.   What is the result of print(type({}) is set)?

Answer

False

Status : Correct   *Marks : 1/1*

10. Set s1 = {1, 2, 4, 3} and s2 = {1, 5, 4, 6}, find s1 & s2, s1 - s2, s1 | s2 and s1 ^ s2.

Answer

s1&s2 = {1, 4}s1-s2 = {2, 3}s1^s2 = {2, 3, 5, 6}s1|s2 = {1, 2, 3, 4, 5, 6}

Status : Correct   *Marks : 1/1*

11. What is the output of the below Python code?

```
list1 = [1, 2, 3]
list2 = [5, 6, 7]
list3 = [10, 11, 12]
set1 = set(list2)
set2 = set(list1)
set1.update(set2)
set1.update(list3)
print(set1)
```

Answer

{1, 2, 3, 5, 6, 7, 10, 11, 12}

Status : Correct   *Marks : 1/1*

12. Which of the following isn't true about dictionary keys?

Answer

More than one key isn't allowed

Status : Wrong   *Marks : 0/1*

13. What will be the output of the following code?

```
a=(1,2,3,4)
print(sum(a,3))
```

Answer

13

Status : Correct   *Marks : 1/1*

14. Which of the following statements is used to create an empty tuple?

Answer

( )

Status : Correct   *Marks : 1/1*

15. If 'a' is a dictionary with some key-value pairs, what does a.popitem() do?

Answer

Removes an arbitrary element

Status : Correct   *Marks : 1/1*

16. What will be the output for the following code?

```
t1 = (1, 2, 4, 3)
t2 = (1, 2, 3, 4)
print(t1 < t2)
```

Answer

False

Status : Correct   *Marks : 1/1*

17. Predict the output of the following Python program

```
init_tuple_a = 1, 2, 8
init_tuple_b = (1, 2, 7)
set1=set(init_tuple_b)
set2=set(init_tuple_a)
print (set1 | set2)
print (init_tuple_a | init_tuple_b)
```

Answer

{1, 2, 7, 8}TypeError: unsupported operand type

Status : Correct   *Marks : 1/1*

18. Fill in the code in order to get the following output.

Output:

Tuple: (1, 3, 4)

Max value: 4

```
t=(1,)
_____
print("Tuple:" ,t)
print("Max value:",_____)
```

Answer

1) t=t+(3,4)2) max(t)

Status : Correct   *Marks : 1/1*

19. What is the output of the following code?

```
a=(1,2,(4,5))
b=(1,2,(3,4))
print(a<b)
```

Answer

False

Status : Correct   *Marks : 1/1*

20. Suppose t = (1, 2, 4, 3), which of the following is incorrect?

Answer

t[3] = 45

Status : Correct   *Marks : 1/1*

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NeoColab_REC_CS23221_Python Programming

REC_Python_Week 5_COD

Attempt : 1
Total Mark : 50
Marks Obtained : 50

Section 1 : Coding

1.   Problem Statement

Liam is analyzing a list of product IDs from a recent sales report. He needs to determine how frequently each product ID appears and calculate the following metrics:

Frequency of each product ID: A dictionary where the key is the product ID and the value is the number of times it appears.Total number of unique product IDs.Average frequency of product IDs: The average count of all product IDs.

Write a program to read the product IDs, compute these metrics, and output the results.

Example

Input:

6   //number of product ID

101

102

101

103

101

102 //product IDs

Output:

{101: 3, 102: 2, 103: 1}

Total Unique IDs: 3

Average Frequency: 2.00

Explanation:

Input 6 indicates that you will enter 6 product IDs.

A dictionary is created to track the frequency of each product ID.

Input 101: Added with a frequency of 1.

Input 102: Added with a frequency of 1.

Input 101: Frequency of 101 increased to 2.

Input 103: Added with a frequency of 1.

Input 101: Frequency of 101 increased to 3.

Input 102: Frequency of 102 increased to 2.

The dictionary now contains 3 unique IDs: 101, 102, and 103.

Total Unique is 3.

The average frequency is 2.00.

Input Format

The first line of input consists of an integer n, representing the number of product IDs.

The next n lines each contain a single integer, each representing a product ID.

Output Format

The first line of output displays the frequency dictionary, which maps each product ID to its count.

The second line displays the total number of unique product IDs, preceded by "Total Unique IDs: ".

The third line displays the average frequency of the product IDs. This is calculated by dividing the total number of occurrences of all product IDs by the total number of unique product IDs, rounded to two decimal places. It is preceded by "Average Frequency: ".

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 6
101
102
101
103
101
102
Output: {101: 3, 102: 2, 103: 1}
Total Unique IDs: 3
Average Frequency: 2.00

Answer

```
n=int(input())
l=[]
d={}
s=0
for i in range(n):
    a=int(input())
    l.append(a)
```

```
    d[a]=l.count(a)
print(d)
print("Total Unique IDs :",len(d))
for i in d:
    s+=d[i]
af=s/len(d)
print(f"Average frequency:{af:.2f}")
```

Status : Correct   *Marks : 10/10*

2.   Problem Statement

Gowshik is working on a task that involves taking two lists of integers as input, finding the element-wise sum of the corresponding elements, and then creating a tuple containing the sum values.

Write a program to help Gowshik with this task.

Example:

Given list:

[1, 2, 3, 4]

[3, 5, 2, 1]

An element-wise sum of the said tuples: (4, 7, 5, 5)

Input Format

The first line of input consists of a single integer n, representing the length of the input lists.

The second line of input consists of n integers separated by commas, representing the elements of the first list.

The third line of input consists of n integers separated by commas, representing the elements of the second list.

Output Format

The output is a single line containing a tuple of integers separated by commas, representing the element-wise sum of the corresponding elements from the two input lists.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 4
1, 2, 3, 4
3, 5, 2, 1
Output: (4, 7, 5, 5)

Answer

```
# You are using Python
def element_wise_sum():
    n=int(input())
    list1=list(map(int,input().split(',')))
    list2=list(map(int,input().split(',')))
    result=tuple(list1[i]+list2[i] for i in range(n))
    print (result)
element_wise_sum()
```

Status : Correct   *Marks : 10/10*

3. Problem Statement

James is managing a list of inventory items in a warehouse. Each item is recorded as a tuple, where the first element is the item ID and the second element is a list of quantities available for that item. James needs to filter out all quantities that are above a certain threshold to find items that have a stock level above this limit.

Help James by writing a program to process these tuples, filter the quantities from all the available items, and display the results.

Note:

Use the filter() function to filter out the quantities greater than the specified threshold for each item's stock list.

Input Format

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

The next N lines each contain a tuple in the format (ID, [quantity1, quantity2, ...]), where ID is an integer and the list contains integers.

The final line consists of an integer threshold, representing the quantity threshold.

Output Format

The output should be a single line displaying the filtered quantities, space-separated. Each quantity is strictly greater than the given threshold.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 2
(1, [1, 2])
(2, [3, 4])
2
Output: 3 4

Answer

```python
# You are using Python
def filter_inventory_items():
    n=int(input().strip())
    all_quantities=[]
    for _ in range(n):
        item=eval(input().strip())
        item_id,quantities=item
        all_quantities.extend(quantities)
    threshold=int(input().strip())
    filtered_quantities=list(filter(lambda x:x>threshold,all_quantities))
    print(" ".join (map(str,filtered_quantities)))
filter_inventory_items()
```

4. Problem Statement

Professor Adams needs to analyze student participation in three recent academic workshops. She has three sets of student IDs: the first set contains students who registered for the workshops, the second set contains students who actually attended, and the third set contains students who dropped out.

Professor Adams needs to determine which students who registered also attended, and then identify which of these students did not drop out.

Help Professor Adams identify the students who registered, attended, and did not drop out of the workshops.

Input Format

The first line of input consists of integers, representing the student IDs who registered for the workshops.

The second line consists of integers, representing the student IDs who attended the workshops.

The third line consists of integers, representing the student IDs who dropped out of the workshops.

Output Format

The first line of output displays the intersection of the first two sets, which shows the IDs of students who registered and attended.

The second line displays the result after removing student IDs that are in the third set (dropped out), showing the IDs of students who both attended and did not drop out.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 1 2 3
2 3 4
3 4 5
Output: {2, 3}
{2}

Answer

```python
# You are using Python
a=(set(map(int,input().split())))
b=(set(map(int,input().split())))
c=(set(map(int,input().split())))
print(a&b)
print((a-c)&b)
```

Status : Correct   *Marks : 10/10*

5. Problem Statement

Ella is analyzing the sales data for a new online shopping platform. She has a record of customer transactions where each customer's data includes their ID and a list of amounts spent on different items. Ella needs to determine the total amount spent by each customer and identify the highest single expenditure for each customer.

Your task is to write a program that computes these details and displays them in a dictionary.

Input Format

The first line of input consists of an integer n, representing the number of customers.

Each of the next n lines contains a numerical customer ID followed by integers representing the amounts spent on different items.

Output Format

The output displays a dictionary where the keys are customer IDs and the values are lists containing two integers: the total expenditure and the maximum single expenditure.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 2
101 100 150 200
102 50 75 100
Output: {101: [450, 200], 102: [225, 100]}

Answer

```python
# You are using Python
n=int(input())
data={}
for i in range(n):
    d=list(map(int,input().split()))
    id=d[0]
    exp=d[1:]
    tot=sum(exp)
    maxi=max(exp)
    data[id]=[tot,maxi]
print(data)
```

Status : Correct   *Marks : 10/10*

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NeoColab_REC_CS23221_Python Programming

REC_Python_Week 5_PAH

Attempt : 1
Total Mark : 60
Marks Obtained : 60

Section 1 : Coding

1. Problem Statement

Sophia is organizing a list of event IDs representing consecutive days of an event. She needs to group these IDs into consecutive sequences. For example, if the IDs 3, 4, and 5 appear consecutively, they should be grouped.

Write a program that helps Sophia by reading the total number of event IDs and the IDs themselves, then display each group of consecutive IDs in tuple format.

Input Format

The first line of input consists of an integer n, representing the number of event IDs.

The next n lines contain integers representing the event IDs, where each integer corresponds to an event ID.

Output Format

The output should display each group of consecutive event IDs in a tuple format. Each group should be printed on a new line, and single event IDs should be displayed as a single-element tuple.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 3
1
2
3
Output: (1, 2, 3)

Answer

```python
# You are using Python
n=int(input())
l=[]
for i in range(n):
    l.append(int(input()))
t=[]
for i in range(n):
    t.append(l[i])
    if i+1>=n:
        if len(t)==1:
            print(f"({t[0]})")
        else:
            print(tuple(t))
    elif l[i]+1!=l[i+1]:
        if len(t)==1:
            print(f"({t[0]})")
        else:
            print(tuple(t))
        t.clear()
```

Status : Correct   *Marks : 10/10*

2. Problem Statement

Rishi is working on a program to manipulate a set of integers. The program should allow users to perform the following operations:

Find the maximum value in the set.Find the minimum value in the set.Remove a specific number from the set.

The program should handle these operations based on user input. If the user inputs an invalid operation choice, the program should indicate that the choice is invalid.

Input Format

The first line contains space-separated integers that will form the initial set. Each integer x is separated by a space.

The second line contains an integer ch, representing the user's choice:

- 1 to find the maximum value
- 2 to find the minimum value
- 3 to remove a specific number from the set

If ch is 3, the third line contains an integer n1, which is the number to be removed from the set.

Output Format

The first line of output prints the original set in descending order.

For choice 1: Print the maximum value from the set.

For choice 2: Print the minimum value from the set.

For choice 3: Print the set after removing the specified number, in descending order.

For invalid choices: Print "Invalid choice".

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 1 2 3 4 5
1

Output: {5, 4, 3, 2, 1}
5

Answer

```python
# You are using Python
def display(*arr):
    print("{",end="")
    for i in range(len(arr)):
        print(arr[i],end="")
        if(i!=len(arr)-1):
            print(",",end="")
    print("}")
l=list(map(int,input().split()))
n=int(input())
d=0
if(n==3):
    d=int(input())
l.sort(reverse=True)
display(*l)
if n==1:
    print(max(l))
elif n==2:
    print(min(l))
elif n==3:
    if d in l:
        l.remove(d)
    display(*l)
else:
    print("Invalid choice")
```

Status : Correct   *Marks : 10/10*

3. Problem Statement

Tom wants to create a dictionary that lists the first n prime numbers, where each key represents the position of the prime number, and the value is the prime number itself.

Help Tom generate this dictionary based on the input she provides.

Input Format

The input consists of an integer n, representing the number of prime numbers Tom wants to generate.

Output Format

The output displays the generated dictionary where each key is an integer from 1 to n, and the corresponding value is the prime number.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 4
Output: {1: 2, 2: 3, 3: 5, 4: 7}

Answer

```python
# You are using Python
import math
n=int(input())

def isprime(p):
    for i in range(2,int(math.sqrt(p))+1):
        if p%i==0:
            return False
    return True
d={}
i=0
num=2
while True:
    if isprime(num):
        i+=1
        d[i]=num
    num+=1
    if(i==n):
        break
print(d)
```

4.   Problem Statement

Mia is organizing a list of integers into a series of pairs for his new project. She wants to create pairs of consecutive integers from the list. The last integer should be paired with None to complete the series. The pairing happens as follows: ((Element 1, Element 2), (Element 2, Element 3)........ (Element n, None)).

Your task is to help Henry by writing a Python program that reads a list of integers, forms these pairs, and displays the result in tuple format.

Input Format

The first line of input consists of an integer n, representing the number of elements in the tuple.

The second line of input contains n space-separated integers, representing the elements of the tuple.

Output Format

The output displays a tuple containing pairs of consecutive integers from the input. The last integer in the tuple is paired with 'None'.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 3
5 10 15
Output: ((5, 10), (10, 15), (15, None))

Answer

```python
# You are using Python
n=int(input().strip())
data=list(map(int,input().split()))
p=[(data[i],data[i+1]) for i in range(n-1)]
```

```
p.append((data[-1],None))
print(tuple(p))
```

Status : Correct   *Marks : 10/10*

5. Problem Statement

Jordan is creating a program to process a list of integers. The program
should take a list of integers as input, remove any duplicate integers while
preserving their original order, concatenate the remaining unique integers
into a single string, and then print the result.

Help Jordan in implementing the same.

Input Format

The input consists of space-separated integers representing the elements of the
set.

Output Format

The output prints a single integer formed by concatenating the unique integers
from the input in the order they appeared.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 11 11 33 50
Output: 113350

Answer

```
# You are using Python
nums=input().split()
s=set()
unique=[]
for num in nums:
    if num not in s:
        s.add(num)
```

```
    unique.append(num)
print("".join(unique))
```

Status : Correct   *Marks : 10/10*

6. Problem Statement

Maya wants to create a dictionary that maps each integer from 1 to a given number n to its square. She will use this dictionary to quickly reference the square of any number up to n.

Help Maya generate this dictionary based on the input she provides.

Input Format

The input consists of an integer n, representing the highest number for which Maya wants to calculate the square.

Output Format

The output displays the generated dictionary where each key is an integer from 1 to n, and the corresponding value is its square.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 5
Output: {1: 1, 2: 4, 3: 9, 4: 16, 5: 25}

Answer

```
# You are using Python
n=int(input())
sq={i:i**2 for i in range(1,n+1)}
print(sq)
```

Status : Correct   *Marks : 10/10*

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NeoColab_REC_CS23221_Python Programming

REC_Python_Week 5_CY

Attempt : 1
Total Mark : 40
Marks Obtained : 30

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

```python
# You are using Python
n=int(input())
l1=list(map(int,input().split()))
m=int(input())
l2=list(map(int,input().split()))
for i in range(n):
    if l1[i]==l2[i]:
        print(l1[i],end=" ")
```

Status : Correct   *Marks : 10/10*

2. Problem Statement

Emily is a librarian who keeps track of books borrowed and returned by her patrons. She maintains four sets of book IDs: the first set represents books

borrowed, the second set represents books returned, the third set represents books added to the collection, and the fourth set represents books that are now missing. Emily wants to determine which books are still borrowed but not returned, as well as those that were added but are now missing. Finally, she needs to find all unique book IDs from both results.

Help Emily by writing a program that performs the following operations on four sets of integers:

Compute the difference between the borrowed books (first set) and the returned books (second set).Compute the difference between the added books (third set) and the missing books (fourth set).Find the union of the results from the previous two steps, and sort the final result in descending order.

Input Format

The first line of input consists of a list of integers representing borrowed books.

The second line of input consists of a list of integers representing returned books.

The third line of input consists of a list of integers representing added books.

The fourth line of input consists of a list of integers representing missing books.

Output Format

The first line of output displays the difference between sets P and Q, sorted in descending order.

The second line of output displays the difference between sets R and S, sorted in descending order.

The third line of output displays the union of the differences from the previous two steps, sorted in descending order.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 1 2 3
2 3 4
5 6 7
6 7 8
Output: [1]
[5]
[5, 1]

Answer

```python
# You are using Python
p=set(map(int,input().split()))
q=set(map(int,input().split()))
r=set(map(int,input().split()))
s=set(map(int,input().split()))
diff1=sorted(p-q,reverse=True)
diff2=sorted(r-s,reverse=True)
union_diff=sorted(set(diff1)|set(diff2),reverse=True)
print(diff1)
print(diff2)
print(union_diff)
```

Status : Correct   *Marks : 10/10*

3.   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 n1, representing the number of items in the first dictionary.

The next n1 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 n2, representing the number of items in the second dictionary

The next n2 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

```python
# You are using Python
n1=int(input())
d1={int(input()):int(input()) for _ in range(n1)}
n2=int(input())
d2={int(input()):int(input()) for _ in range(n2)}
```

```
result={}
all_keys = set(d1) | set(d2)

for key in all_keys:
    if key in d1 and key in d2:
        result[key]=abs(d1[key]-d2[key])
    elif key in d1:
        result[key]=d1[key]
    else:
        result[key]=d2[key]
print(result)
```

Status : Wrong   *Marks : 0/10*

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

```python
# You are using Python
n=int(input())
maxc=""
maxn=0
for i in range(n):
    code=input()
    yr1=int(input())
    yr2=int(input())
    diff=yr2-yr1
    if diff>maxn:
        maxn=diff
        maxc=code
print(f"{{{maxc}:{maxn}}}")
```

Status : Correct   *Marks : 10/10*

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NeoColab_REC_CS23221_Python Programming

REC_Python_Week 6_MCQ

Attempt : 1
Total Mark : 20
Marks Obtained : 18

Section 1 : MCQ

1.   Match the following:

a) f.seek(5,1) i) Move file pointer five characters behind from the current position

b) f.seek(-5,1) ii) Move file pointer to the end of a file

c) f.seek(0,2) iii) Move file pointer five characters ahead from the current position

d) f.seek(0) iv) Move file pointer to the beginning of a file

Answer

a-iii, b-i, c-ii, d-iv

Status : Correct   *Marks : 1/1*

2. What is the output of the following code?

```
try:
    x = "hello" + 5
except TypeError:
    print("Type Error occurred")
finally:
    print("This will always execute")
```

Answer

Type Error occurredThis will always execute

Status : Correct   *Marks : 1/1*

3. Fill in the code in order to get the following output:

Output:

Name of the file: ex.txt

```
fo = open(_____(1), "wb")
print("Name of the file: ",_____)(2)
```

Answer

1) "ex.txt"2) fo.name

Status : Correct   *Marks : 1/1*

4. What is the output of the following code?

```
class MyError(Exception):
    pass

try:
    raise MyError("Something went wrong")
except MyError as e:
    print(e)
```

Answer

Something went wrong

Status : Correct   *Marks : 1/1*

5.   What is the correct way to raise an exception in Python?

Answer

raise Exception()

Status : Correct   *Marks : 1/1*

6.   Which of the following is true about

fp.seek(10,1)

Answer

Move file pointer ten characters behind from the current position

Status : Wrong   *Marks : 0/1*

7.   What will be the output of the following Python code?

```
f = None
for i in range (5):
    with open("data.txt", "w") as f:
        if i > 2:
            break
print(f.closed)
```

Answer

True

Status : Correct   *Marks : 1/1*

8.   What is the purpose of the except clause in Python?

Answer

To handle exceptions during code execution

Status : Correct   *Marks : 1/1*

9.   What happens if an exception is not caught in the except clause?

Answer

The program will display a traceback error and stop execution

Status : Correct   *Marks : 1/1*

10.   How do you create a user-defined exception in Python?

Answer

By creating a new class that inherits from the Exception class

Status : Correct   *Marks : 1/1*

11.   What is the difference between r+ and w+ modes?

Answer

in r+ the pointer is initially placed at the beginning of the file and the pointer is at the end for w+

Status : Correct   *Marks : 1/1*

12.   What happens if no arguments are passed to the seek function?

Answer

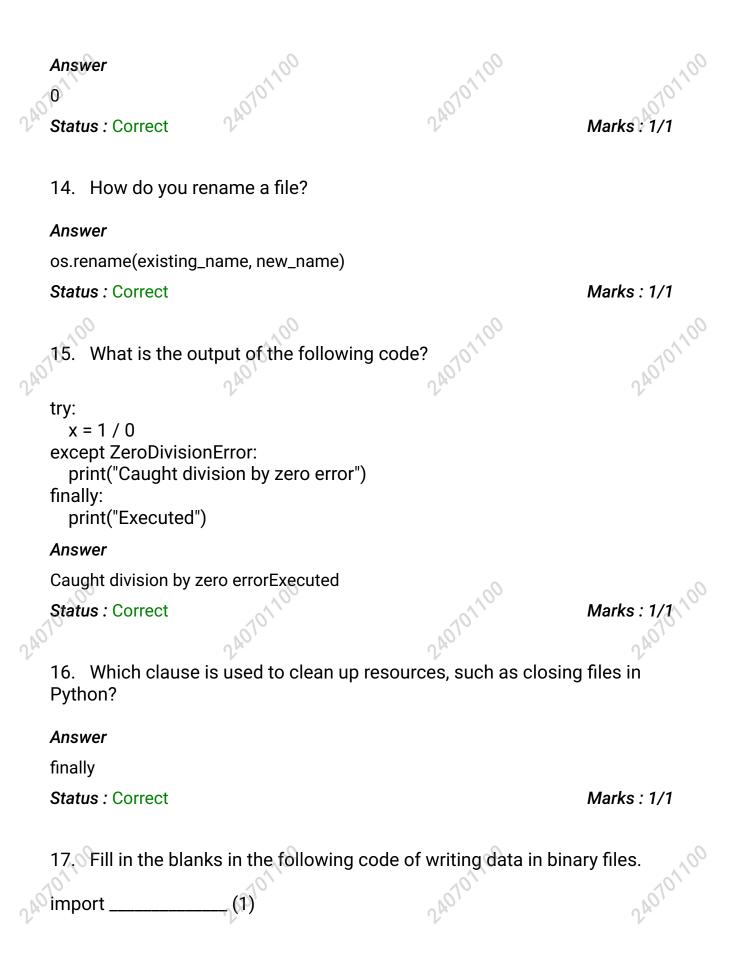file position is set to the start of file

Status : Wrong   *Marks : 0/1*

13.   What is the default value of reference_point in the following code?

file_object.seek(offset [,reference_point])

Answer

0

Status : Correct   *Marks : 1/1*

14. How do you rename a file?

Answer

os.rename(existing_name, new_name)

Status : Correct   *Marks : 1/1*

15. What is the output of the following code?

```
try:
    x = 1 / 0
except ZeroDivisionError:
    print("Caught division by zero error")
finally:
    print("Executed")
```

Answer

Caught division by zero errorExecuted

Status : Correct   *Marks : 1/1*

16. Which clause is used to clean up resources, such as closing files in Python?

Answer

finally

Status : Correct   *Marks : 1/1*

17. Fill in the blanks in the following code of writing data in binary files.

import _____ (1)

```
rec=[]
while True:
    rn=int(input("Enter"))
    nm=input("Enter")
    temp=[rn, nm]
    rec.append(temp)
    ch=input("Enter choice (y/N)")
    if ch.upper=="N":
        break
f.open("stud.dat","_____")(2)
_____.dump(rec,f)(3)
_____.close()(4)
```

Answer

(pickle,wb,pickle,f)

Status : Correct   *Marks : 1/1*

18.   What will be the output of the following Python code?

```
# Predefined lines to simulate the file content
lines = [
    "This is 1st line",
    "This is 2nd line",
    "This is 3rd line",
    "This is 4th line",
    "This is 5th line"
]

print("Name of the file: foo.txt")

# Print the first 5 lines from the predefined list
for index in range(5):
    line = lines[index]
    print("Line No %d - %s" % (index + 1, line.strip()))
```

Answer

Displays Output

Status : Correct   *Marks : 1/1*

19. Fill the code to in order to read file from the current position.

Assuming exp.txt file has following 3 lines, consider current file position is beginning of 2nd line

Meri,25

John,21

Raj,20

Ouptput:

['John,21\n','Raj,20\n']


```
f = open("exp.txt", "w+")
_____(1)
print _____(2)
```

Answer

1) f.seek(0, 1)2) f.readlines()

Status : Correct   *Marks : 1/1*

20. Which of the following is true about the finally block in Python?

Answer

The finally block is always executed, regardless of whether an exception occurs or not

Status : Correct   *Marks : 1/1*

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NeoColab_REC_CS23221_Python Programming

REC_Python_Week 6_COD

Attempt : 1
Total Mark : 50
Marks Obtained : 50

Section 1 : Coding

1. Problem Statement

Tara is a content manager who needs to perform case conversions for various pieces of text and save the results in a structured manner.

She requires a program to take a user's input string, save it in a file, and then retrieve and display the string in both upper-case and lower-case versions. Help her achieve this task efficiently.

File Name: text_file.txt

Input Format

The input consists of a single line containing a string provided by the user.

Output Format

The first line displays the original string read from the file in the format: "Original String: {original_string}".

The second line displays the upper-case version of the original string in the format: "Upper-Case String: {upper_case_string}".

The third line displays the lower-case version of the original string in the format: "Lower-Case String: {lower_case_string}".

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: #SpecialSymBoLs1234

Output: Original String: #SpecialSymBoLs1234
Upper-Case String: #SPECIALSYMBOLS1234
Lower-Case String: #specialsymbols1234

Answer

```
# You are using Python
s=input()
with open("text_file.txt","w") as f:
    f.write(s)
with open("text_file.txt","r") as f:
    c=f.read()
print("Original String:",c)
print("Upper-case string:",c.upper())
print("Lower-case string:",c.lower())
```

Status : Correct   *Marks : 10/10*

2. Problem Statement

Write a program that calculates the average of a list of integers. The program prompts the user to enter the length of the list (n) and each element of the list. It performs error handling to ensure that the length of the list is a non-negative integer and that each input element is a numeric value.

The first line of the input is an integer n, representing the length of the list as a positive integer.

The second line of the input consists of an element of the list as an integer, separated by a new line.

Output Format

If the length of the list is not a positive integer or zero, the output displays "Error: The length of the list must be a non-negative integer."

If a non-numeric value is entered for the length of the list, the output displays "Error: You must enter a numeric value."

If a non-numeric value is entered for a list element, the output displays "Error: You must enter a numeric value."

If the inputs are valid, the program calculates and prints the average of the provided list of integers with two decimal places: "The average is: [average]".

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: -2
1
2
Output: Error: The length of the list must be a non-negative integer.

Answer

```python
# You are using Python
try:
    k=int(input())
    if k<=0:
        raise Exception
    else:
```

```
    l=[]
    for i in range(k):
        n=input().strip()
        if(not n.isdigit()):
            raise ValueError
        l.append(int(n))
    t=sum(l)
    m=t/k
    print(f"The average is:{m:.2f}")
except ValueError:
    print("Error: You must enter a numeric value.")
except Exception:
    print("Error: The length of the list must be a non-negative integer. ")
```

Status : Correct   ***Marks : 10/10***

3. Problem Statement

In a voting system, a person must be at least 18 years old to be eligible to vote. If a user enters an age below 18, the system should raise a user-defined exception indicating that they are not eligible to vote.

Input Format

The input contains a positive integer representing age.

Output Format

If the age is less than 18, the output displays "Not eligible to vote".

Otherwise, the output displays "Eligible to vote".

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 18
Output: Eligible to vote

Answer

```python
# You are using Python
age=int(input())
try:
    if age>=18:
        print("Eligible to vote")
    else:
        raise ValueError
except  ValueError:
    print("Not eligible to vote")
```

Status : Correct   *Marks : 10/10*

4. Problem Statement

A retail store requires a program to calculate the total cost of purchasing a product based on its price and quantity. The program performs validation to ensure valid inputs and handles specific error conditions using exceptions:

Price Validation: If the price is zero or less, raise a ValueError with the message: "Invalid Price".Quantity Validation: If the quantity is zero or less, raise a ValueError with the message: "Invalid Quantity".Cost Threshold: If the total cost exceeds 1000, raise RuntimeError with the message: "Excessive Cost".

Input Format

The first line of input consists of a double value, representing the price of a product.

The second line consists of an integer, representing the quantity of the product.

Output Format

If the calculation is successful, print the total cost rounded to one decimal place.

If the price is zero or less prints "Invalid Price".

If the quantity is zero or less prints "Invalid Quantity".

If the total cost exceeds 1000, prints "Excessive Cost".

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 20.0
5
Output: 100.0

Answer

```python
# You are using Python
p=float(input())
n=int(input())
try:
    if p<=0:
        print("Invalid Price")
    elif n<=0:
        print("Invalid Quantity")
    elif p*n>1000:
        print("Excessive Cost")
    else:
        print(p*n)
except ValueError:
    pass
except RuntimeError:
    pass
```

Status : Correct   *Marks : 10/10*

5. Problem Statement

Sophie enjoys playing with words and wants to count the number of words in a sentence. She inputs a sentence, saves it to a file, and then reads it from the file to count the words.

Write a program to determine the number of words in the input sentence.

File Name: sentence_file.txt

Input Format

The input consists of a single line of text containing words separated by spaces.

Output Format

The output displays the count of words in the sentence.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: Four Words In This Sentence
Output: 5

Answer

```python
# You are using Python
s=input()
with open("Sentence_file.txt","w") as f:
    f.write(s)
with open("Sentence_file.txt","r") as f:
    c=f.read()
print(len(c.split()))
```

Status : Correct   *Marks : 10/10*

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NeoColab_REC_CS23221_Python Programming

REC_Python_Week 6_PAH

Attempt : 1
Total Mark : 30
Marks Obtained : 26

Section 1 : Coding

1. Problem Statement

Reeta is playing with numbers. Reeta wants to have a file containing a list of numbers, and she needs to find the average of those numbers. Write a program to read the numbers from the file, calculate the average, and display it.

File Name: user_input.txt

Input Format

The input file will contain a single line of space-separated numbers (as a string).

These numbers may be integers or decimals.

Output Format

If all inputs are valid numbers, the output should print: "Average of the numbers is: X.XX" (where X.XX is the computed average rounded to two decimal places)

If the input contains invalid data, print: "Invalid data in the input."

Refer to the sample output for format specifications.

Sample Test Case

Input: 1 2 3 4 5
Output: Average of the numbers is: 3.00

Answer

```python
# You are using Python
fname='user_input.txt'
inputstr=input()
with open(fname,'w')as f:
    f.write(inputstr)
with open(fname,'r')as f:
    line=f.readline().strip()
num_str=line.split()
try:
    num=[float(i) for i in num_str]
    avg=sum(num)/len(num)
    print(f"Average of the numbers is : {avg:.2f}")
except ValueError:
    print("Invalid data in the input.")
```

Status : Correct   *Marks : 10/10*

2. Problem Statement

John is a data analyst who often works with text files. He needs a program that can analyze the contents of a text file and count the number of times a specific character appears in the file.

John wants a simple program that allows him to specify a file and a character to count within that file.

Input Format

The first line of input consists of the file's name to be analyzed.

The second line of the input consists of the string they want to write within the file.

The third line of the input consists of a character to count within the file.

Output Format

If the character is found, the output displays "The character 'X' appears {Y} times in the file." where X is the character and Y i the count,

If the character does not appear in the file, the output displays "Character not found."

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: test.txt
This is a test file to check the character count.
e
Output: The character 'e' appears 5 times in the file.

Answer

```python
# You are using Python
fname=input().strip()
s=input().lower()
fc=input().lower()
with open(fname,"w") as f:
    f.write(s)
with open(fname,"r") as f:
    c=f.read()
ct=c.count(fc)
if ct>0:
    print(f"The character '{fc}' appears {ct} times in the file.")
```

```
else:
    print("Character not found in the file.")
```

Status : Correct   *Marks : 10/10*

3. Problem Statement

Peter manages a student database and needs a program to add students.
For each student, Alex inputs their ID and name. The program checks for
duplicate IDs and ensures the database isn't full.

If a duplicate or a full database is detected, an appropriate error message
is displayed. Otherwise, the student is added, and a confirmation message
is shown. The database has a maximum capacity of 30 students, and each
student must have a unique ID.

Input Format

The first line contains an integer n, representing the number of students to be
added to the school database.

The next n lines each contain two space-separated values, representing the
student's ID (integer) and the student's name (string).

Output Format

The output will depend on the actions performed in the code.

If a student is added to the database, the output will display: "Student with ID [ID
number] added to the database."

If there is an exception due to a duplicate student ID, the output will display:
"Exception caught. Error: Student ID already exists."

If there is an exception due to the database being full, the output will display:
"Exception caught. Error: Student database is full."

Refer to the sample outputs for the formatting specifications.

Sample Test Case

Input: 3
16 Sam
87 Sabari
43 Dani

Output: Student with ID 16 added to the database.
Student with ID 87 added to the database.
Student with ID 43 added to the database.

Answer

```python
# You are using Python
MAX_CAPACITY=30
n=int(input())
db={}

for _ in range(n):
    if len(db) >= MAX_CAPACITY:
        print("Exception caught. Error: Student database is full.")
        continue
    parts=input().split()
    s_id=int(parts[0])
    s_name=parts[1]

    if s_id in db:
        print("Exception caught. Error: Student ID already exists.")
    else:
        db[s_id]=s_name
        print(f"Student with ID {s_id} added to the database.")
```

Status : Partially correct   *Marks : 6/10*

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NeoColab_REC_CS23221_Python Programming

REC_Python_Week 6_CY

Attempt : 1
Total Mark : 40
Marks Obtained : 26.5

Section 1 : Coding

1. Problem Statement

Write a program to read the Register Number and Mobile Number of a student. Create user-defined exception and handle the following:

If the Register Number does not contain exactly 9 characters in the specified format(2 numbers followed by 3 characters followed by 4 numbers) or if the Mobile Number does not contain exactly 10 characters, throw an IllegalArgumentException. If the Mobile Number contains any character other than a digit, raise a NumberFormatException.If the Register Number contains any character other than digits and alphabets, throw a NoSuchElementException.If they are valid, print the message 'valid' or else print an Invalid message.

Input Format

The first line of the input consists of a string representing the Register number.

The second line of the input consists of a string representing the Mobile number.

Output Format

The output should display any one of the following messages:

If both numbers are valid, print "Valid".

If an exception is raised, print "Invalid with exception message: ", followed by the specific exception message.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 19ABC1001
9949596920
Output: Valid

Answer

```python
# You are using Python
reg_no=input().strip()
mob_no=input().strip()

try:
    if len(reg_no) !=9:
        raise Exception("Register number should have exactly 9 charateers."

    elif not reg_no.isalnum():
        raise Exception("Register number shoud contain only digits and alphabets." )
    elif not(reg_no[:2].isdigits() and reg_no[2.5].isalpha() and reg_no[5:].isdigits()):
```

Status : Wrong   *Marks : 0/10*

2. Problem Statement

Alex is creating an account and needs to set up a password. The program

prompts Alex to enter their name, mobile number, chosen username, and desired password. Password validation criteria include:

Length between 10 and 20 characters.At least one digit.At least one special character from !@#$%^&* set. Display "Valid Password" if criteria are met; otherwise, raise an exception with an appropriate error message.

Input Format

The first line of the input consists of the name as a string.

The second line of the input consists of the mobile number as a string.

The third line of the input consists of the username as a string.

The fourth line of the input consists of the password as a string.

Output Format

If the password is valid (meets all the criteria), it will print "Valid Password"

If the password is weak (fails any one or more criteria), it will print an error message accordingly.

Refer to the sample outputs for the formatting specifications.

Sample Test Case

Input: John
9874563210
john
john1#nhoj
Output: Valid Password

Answer

```
# You are using Python
name=input().strip()
mobnum=input().strip()
username=input().strip()
password=input().strip()
```

```
splchar=set("!@#$%^&*")
try:
    if not any(i.isdigit() for i in password):
        raise Exception("Should contain at least one digit")
    elif not any(i in splchar for i in password):
        raise Exception("It should contain at least one special character")
    elif len(password)<10 or len(password)>20:
        raise Exception("Should be a minimum of 10 characters and a maximum of
20 characters")

except Exception as e:
    print(e)
else:
    print("Valid Password")
```

Status : Partially correct   ***Marks : 6.5/10***

3. Problem Statement

Bob, a data analyst, requires a program to automate the process of analyzing character frequency in a given text. This program should allow the user to input a string, calculate the frequency of each character within the text, save these character frequencies to a file named "char_frequency.txt," and display the results.

Input Format

The input consists of the string.

Output Format

The first line prints "Character Frequencies:".

The following lines print the character frequency in the format: "X: Y" where X is the character and Y is the count.

Refer to the sample output for the formatting specifications.

Input: aaabbbccc

Output: Character Frequencies:

a: 3

b: 3

c: 3

Answer

```python
# You are using Python
from collections import OrderedDict
text=input()
fre=OrderedDict()
for char in text:
    if char in fre:
        fre[char]+=1
    else:
        fre[char]=1
with open("char_frequency.txt","w") as file:
    print("Character Frequencies:")
    file.write("Character Freqencies:\n")
    for char,count in fre.items():
        print(f"{char}:{count}")
        file.write(f"{char}:{count}\n")
```

Status : Correct   *Marks : 10/10*

4. Problem Statement

A shopkeeper is recording the daily sales of an item for N days, where the price of the item remains the same for all days. Write a program to calculate the total sales for each day and save them in a file named sales.txt that can store the data for a maximum of 30 days. Then, read the file and display the total earnings for each day.

Note: Total Earnings for each day = Number of Items sold in that day × Price of the item.

Input Format

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

The second line of input consists of N space-separated integers representing the number of items sold each day.

The third line of input consists of an integer M, representing the price of the item that is common for all N days.

Output Format

If the number of days entered exceeds 30 (N > 30), the output prints "Exceeding limit!" and terminates.

Otherwise, the code reads the contents of the file and displays the total earnings for each day on separate lines.

Contents of the file: The total earnings for N days, with each day's earnings appearing on a separate line.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 4
5 10 5 0
20

Output: 100
200
100
0

Answer

```python
# You are using Python
n=int(input())
if n>30:
    print("Exceeding limit!")
else:
    instr=input().strip()
```

```
price=int(input())
with open ("sales.txt",'w') as f:
    f.write(instr)
with open ("sales.txt",'r') as f:
    l=f.read().split()
for i in l:
    print(int(i)*price)
```

Status : Correct   *Marks : 10/10*

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Scan to verify results

NeoColab_REC_CS23221_Python Programming

REC_Python_Week 7_MCQ

Attempt : 1
Total Mark : 20
Marks Obtained : 19

Section 1 : MCQ

1. What is the output of the following code?

```
import numpy as np
a = np.arange(10)
print(a[2:5])
```

Answer

[2, 3, 4]

Status : Correct   *Marks : 1/1*

2. What is the output of the following NumPy code?

```
import numpy as np
arr = np.array([1, 2, 3, 4, 5])
```

```
r = arr[2:4]
print(r)
```

Answer

[3 4]

Status : Correct   *Marks : 1/1*

3.   The important data structure of pandas is/are ____.

Answer

Both Series and Data Frame

Status : Correct   *Marks : 1/1*

4.   Which NumPy function is used to create an identity matrix?

Answer

numpy.eye()

Status : Wrong   *Marks : 0/1*

5.   What is the purpose of the following NumPy code snippet?

```
import numpy as np
arr = np.zeros((3, 4))
print(arr)
```

Answer

Displays a 3x4 matrix filled with zeros

Status : Correct   *Marks : 1/1*

6.   What is the primary data structure used in NumPy for numerical computations?

Answer

Array

Status : Correct   *Marks : 1/1*

7.   Which NumPy function is used to calculate the standard deviation of an array?

Answer

numpy.std()

Status : Correct   *Marks : 1/1*

8.   Which NumPy function is used to find the indices of the maximum and minimum values in an array?

Answer

argmax() and argmin()

Status : Correct   *Marks : 1/1*

9.   Which function is used to create a Pandas DataFrame?

Answer

pd.DataFrame()

Status : Correct   *Marks : 1/1*

10.   What does the np.arange(10) function in NumPy do?

Answer

Creates an array with values from 1 to 9

Status : Correct   *Marks : 1/1*

11.   In NumPy, how do you access the first element of a one-dimensional array arr?

Answer

arr[0]

Status : Correct   ***Marks : 1/1***

12.   What does NumPy stand for?

Answer

Numerical Python

Status : Correct   ***Marks : 1/1***

13.   What will be the output of the following code snippet?

```
import numpy as np
arr = np.array([1, 2, 3])
result = np.concatenate((arr, arr))
print(result)
```

Answer

[1 2 3 1 2 3]

Status : Correct   ***Marks : 1/1***

14.   Which of the following is a valid way to import NumPy in Python?

Answer

import numpy as np

Status : Correct   ***Marks : 1/1***

15.   What is the primary purpose of Pandas DataFrame?

Answer

To store data in tabular form for analysis and manipulation

Status : Correct   ***Marks : 1/1***

16. In the DataFrame created in the code, what is the index for the row containing the data for 'Jack'?

```
import pandas as pd

data = {'Name': ['Tom', 'Jack', 'nick', 'juli'],
    'marks': [99, 98, 95, 90]}

df = pd.DataFrame(data, index=['rank1',
        'rank2',
        'rank3',
        'rank4'])
print(df)
```

Answer

rank2

Status : Correct   *Marks : 1/1*

17.   What is the result of the following NumPy operation?

```
import numpy as np
arr = np.array([1, 2, 3])
r = arr + 5
print(r)
```

Answer

[6 7 8]

Status : Correct   *Marks : 1/1*

18.   Minimum number of argument we require to pass in pandas series ?

Answer

1

Status : Correct   *Marks : 1/1*

19. What is the output of the following NumPy code snippet?

```
import numpy as np
arr = np.array([1, 2, 3, 4, 5])
r = arr[arr > 2]
print(r)
```

Answer

[3 4 5]

Status : Correct   *Marks : 1/1*

20. What will be the output of the following code?

```
import pandas as pnd
pnd.Series([1,2], index= ['a','b','c'])
```

Answer

Value Error

Status : Correct   *Marks : 1/1*

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NeoColab_REC_CS23221_Python Programming

REC_Python_Week 7_COD

Attempt : 1
Total Mark : 50
Marks Obtained : 50

Section 1 : Coding

1. Problem Statement

A company tracks the monthly sales data of various products. You are given a table where each row represents a product and each column represents its monthly sales in sequential months.

Your task is to compute the cumulative monthly sales for each product using numpy, where the cumulative sales for a month is the total sales from month 1 up to that month.

Input Format

The first line of input consists of two integer values, products and months, separated by a space.

Each of the next products lines consists of months integer values representing the monthly sales data of a product.

Output Format

The first line of output prints: "Cumulative Monthly Sales:"

The second line of output prints: the 2D numpy array cumulative_array that contains the cumulative sales data for each product.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 2 4
10 20 30 40
5 15 25 35
Output: Cumulative Monthly Sales:
[[10 30 60 100]
 [5 20 45 80]]

Answer

```
import numpy as np

products, months = map(int, input().split())
sales_data = [list(map(int, input().split())) for _ in range(products)]
sales_array = np.array(sales_data)
cumulative_array = np.cumsum(sales_array, axis=1)
print("Cumulative Monthly Sales:")
print(cumulative_array)
```

Status : Correct   *Marks : 10/10*

2. Problem Statement

Alex is a data scientist analyzing the relationship between two financial indicators over time. He has collected two time series datasets representing daily values of these indicators over several months. Alex wants to understand how these two indicators correlate at different time lags to identify possible leading or lagging behaviors.

Your task is to help Alex compute the cross-correlation of these two time

series using numpy, so he can analyze the similarity between the two signals at various time shifts.

Input Format

The first line of input consists of space-separated float values representing the first time series, array1.

The second line of input consists of space-separated float values representing the second time series, array2.

Output Format

The first line of output prints: "Cross-correlation of the two time series:"

The second line of output prints: the 1D numpy array cross_corr representing the cross-correlation of array1 and array2 across different lags.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 1.0 2.0 3.0
4.0 5.0 6.0
Output: Cross-correlation of the two time series:
[6. 17. 32. 23. 12.]

Answer

```
import numpy as np

array1 = np.array(list(map(float, input().split())))
array2 = np.array(list(map(float, input().split())))

cross_corr = np.correlate(array1, array2, mode='full')

print("Cross-correlation of the two time series:")
print(cross_corr)
```

3. Problem Statement

Sita works as a sales analyst and needs to analyze monthly sales data for different cities. She receives lists of cities, months, and corresponding sales values and wants to create a pandas DataFrame using a MultiIndex of cities and months.

Help her to implement this task and calculate total sales for each city.

Input Format

The first line of input consists of an integer value, n, representing the number of records.

The second line of input consists of n space-separated city names.

The third line of input consists of n space-separated month names.

The fourth line of input consists of n space-separated float values representing sales for each city-month combination.

Output Format

The first line of output prints: "Monthly Sales Data with MultiIndex:"

The next lines print the DataFrame with MultiIndex (City, Month) and their corresponding sales values.

The following line prints: "\nTotal Sales Per City:"

The final lines print the total sales per city, computed by grouping the sales data on city names.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 4

NYC NYC LA LA
Jan Feb Jan Feb
100 200 300 400
Output: Monthly Sales Data with MultiIndex:
        Sales
City Month
NYC Jan   100.0
     Feb   200.0
LA   Jan   300.0
     Feb   400.0

Total Sales Per City:
     Sales
City
LA   700.0
NYC   300.0

Answer

```python
import pandas as pd

n = int(input())
cities = input().split()
months = input().split()
sales = list(map(float, input().split()))

index = pd.MultiIndex.from_arrays([cities, months], names=["City", "Month"])
df = pd.DataFrame({"Sales": sales}, index=index)

print("Monthly Sales Data with MultiIndex:")
print(df)

print("\nTotal Sales Per City:")
total_sales = df.groupby(level="City").sum()
print(total_sales)
```

Status : Correct   *Marks : 10/10*

4. Problem Statement

Rekha works in hospital data management and receives patient records

with missing or incomplete data. She needs to clean the records by performing the following tasks:

Calculate the mean of the available Age values.Replace any missing (NaN) values in the Age column with this mean age.Remove any rows where the Diagnosis value is missing (NaN).Reset the DataFrame index after removing these rows.

Implement this data cleaning task using the pandas package.

Input Format

The first line of input contains an integer n representing the number of patient records.

The second line contains the CSV header — comma-separated column names (e.g., "Name,Age,Diagnosis,Gender").

The next n lines each contain one patient record in comma-separated format.

Output Format

The first line of output is the text:

Cleaned Hospital Records:

The next lines print the cleaned pandas DataFrame (as produced by print(cleaned_df)).

This will include the updated values of the Age column (with missing ages filled by the mean age), and any rows with missing Diagnosis removed.

The DataFrame will be displayed using the default pandas print() representation.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 5
PatientID,Name,Age,Diagnosis
1,John Doe,45,Flu

2,Jane Smith,,Cold
3,Bob Lee,50,
4,Alice Green,38,Fever
5,Tom Brown,,Infection
Output: Cleaned Hospital Records:

	PatientID	Name	Age	Diagnosis
0	1	John Doe	45.000000	Flu
1	2	Jane Smith	44.333333	Cold
2	4	Alice Green	38.000000	Fever
3	5	Tom Brown	44.333333	Infection

Answer

```
import pandas as pd
import numpy as np
n = int(input())
columns = input().split(',')
data = [input().split(',') for _ in range(n)]
df = pd.DataFrame(data, columns=columns)
df['Age'] = pd.to_numeric(df['Age'], errors='coerce')
df['PatientID'] = pd.to_numeric(df['PatientID'], errors='coerce')
df.replace('',np.nan,inplace=True)
mean_age=df['Age'].mean()
df['Age']=df['Age'].fillna(mean_age)
cleaned_df=df.dropna(subset=['Diagnosis']).reset_index(drop=True)
print("Cleaned Hospital Records:")
print(cleaned_df)
```

Status : Correct   *Marks : 10/10*

5. Problem Statement

Sita is analyzing her company's daily sales data to find all sales values that are multiples of 5 and exceed 100. She wants to filter these specific sales values from the list.

Help her to implement the task using the numpy package.

Formula:

To filter sales values:

Select all values s from sales such that (s % 5 == 0) and (s > 100)

Input Format

The first line of input consists of an integer value, n, representing the number of sales entries.

The second line of input consists of n floating-point values, sales, separated by spaces, representing daily sales figures.

Output Format

The output prints: filtered_sales

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 5
50.0 100.0 105.0 150.0 99.0
Output: [105. 150.]

Answer

```python
# You are using Python
import numpy as np

n = int(input())
sales = np.array(list(map(float, input().split())))

filtered_sales = sales[(sales % 5 == 0) & (sales > 100)]

print(filtered_sales)
```

Status : Correct   *Marks : 10/10*

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NeoColab_REC_CS23221_Python Programming

REC_Python_Week 7_CY

Attempt : 1
Total Mark : 50
Marks Obtained : 50

Section 1 : Coding

1. Problem Statement

Rekha is a meteorologist analyzing rainfall data collected over 5 years, with monthly rainfall recorded for each year. She wants to find the total rainfall each year and also identify the month with the maximum rainfall for every year.

Help her to implement the task using the numpy package.

Formula:

Yearly total rainfall = sum of all 12 months' rainfall for each year

Month with max rainfall = index of the maximum rainfall value within the 12 months for each year (0-based index)

Input Format

The input consists of 5 lines.

Each line contains 12 floating-point values separated by spaces, representing the rainfall data (in mm) for each month of that year.

Output Format

The first line of output prints: yearly_totals

The second line of output prints: max_rainfall_months

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0
2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0 13.0
3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0 13.0 14.0
4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0 13.0 14.0 15.0
5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0 13.0 14.0 15.0 16.0
Output: [78. 90. 102. 114. 126.]
[11 11 11 11 11]

Answer

import numpy as np

rainfall_data = [list(map(float, input().split())) for _ in range(5)]
data = np.array(rainfall_data)

yearly_totals = np.sum(data, axis=1)
max_rainfall_months = np.argmax(data, axis=1)

print(yearly_totals)
print(max_rainfall_months)

Status : Correct   *Marks : 10/10*

2. Problem Statement

Rekha works as an e-commerce data analyst. She receives transaction data containing purchase dates and needs to extract the month and day from these dates using the pandas package.

Help her implement this task by performing the following steps:

Convert the Purchase Date column to datetime format, treating invalid date entries as NaT (missing).

Create two new columns:

Purchase Month, containing the month (as an integer) extracted from the Purchase Date.

Purchase Day, containing the day (as an integer) extracted from the Purchase Date. Keep the rest of the data as is.

Input Format

The first line of input contains an integer n, representing the number of records.

The second line contains the CSV header — comma-separated column names.

The next n lines each contain a transaction record in comma-separated format.

Output Format

The first line of output is the text:

Transformed E-commerce Transaction Data:

The next lines print the pandas DataFrame with:

The original columns (including Purchase Date, which is now in datetime format or NaT if invalid).

Two additional columns: Purchase Month and Purchase Day.

The output uses the default pandas DataFrame string representation as produced by print(transformed_df).

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 3
Customer,Purchase Date
Alice,2023-05-15
Bob,2023-06-20
Charlie,2023-07-01

Output: Transformed E-commerce Transaction Data:
```
  Customer Purchase Date  Purchase Month  Purchase Day
0    Alice   2023-05-15              5            15
1      Bob   2023-06-20              6            20
2  Charlie   2023-07-01              7             1
```

Answer

```python
import pandas as pd

n = int(input())
columns = input().split(',')

data = [input().split(',') for _ in range(n)]
df = pd.DataFrame(data, columns=columns)

df['Purchase Date'] = pd.to_datetime(df['Purchase Date'], errors='coerce')
df['Purchase Month'] = df['Purchase Date'].dt.month
df['Purchase Day'] = df['Purchase Date'].dt.day

print("Transformed E-commerce Transaction Data:")
print(df)
```

Status :* Correct**   ***Marks : 10/10

3. Problem Statement

Arjun is monitoring hourly temperature data recorded continuously for multiple days. He needs to calculate the average temperature for each day based on 24 hourly readings.

Help him to implement the task using the numpy package.

Formula:

Reshape the temperature readings into rows where each row has 24 readings (one day).

Average temperature per day = mean of 24 hourly readings in each row.

Input Format

The first line of input consists of an integer value, n, representing the total number of temperature readings.

The second line of input consists of n floating-point values separated by spaces, representing hourly temperature readings.

Output Format

The output prints: avg_per_day

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 30
30.0 30.0 30.0 30.0 30.0 30.0 30.0 30.0 30.0 30.0 30.0 30.0 30.0 30.0 30.0 30.0 30.0 30.0 30.0 30.0 30.0 30.0 30.0 30.0
Output: [30.]

Answer

```python
import numpy as np

n = int(input())
readings = np.array(list(map(float, input().split())))

reshaped = readings.reshape(-1, 24)
avg_per_day = reshaped.mean(axis=1)

print(avg_per_day)
```

Status : Correct   *Marks : 10/10*

4.   Problem Statement

Arjun is developing a system to monitor environmental sensors installed in different rooms of a smart building. Each sensor records multiple temperature readings throughout the day. To compare sensor data fairly despite differing scales, Arjun needs to normalize each sensor's readings so that they have a mean of zero and standard deviation of one.

Help him implement this normalization using numpy.

Normalization Formula:

Input Format

The first line of input consists of two integers: sensors (number of sensors) and samples (number of readings per sensor).

The next sensors lines each contain samples space-separated floats representing the sensor readings.

Output Format

The first line of output prints: "Normalized Sensor Data:"

The next lines print the normalized readings as a numpy array, where each row corresponds to a sensor's normalized values.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 3 3
1.0 2.0 3.0
4.0 5.0 6.0
7.0 8.0 9.0

Output: Normalized Sensor Data:
[[-1.22474487 0.   1.22474487]
 [-1.22474487 0.   1.22474487]
 [-1.22474487 0.   1.22474487]]

Answer

import numpy as np

sensors, samples = map(int, input().split())
data = [list(map(float, input().split())) for _ in range(sensors)]
arr = np.array(data)

mean = np.mean(arr, axis=1, keepdims=True)
std = np.std(arr, axis=1, keepdims=True)

normalized = (arr - mean) / std

print("Normalized Sensor Data:")
print(normalized)

Status : Correct   *Marks : 10/10*

5.   Problem Statement

You are working as a data analyst for a small retail store that wants to track the stock levels of its products. Each product has a unique Name (such as "Toothpaste", "Shampoo", "Soap") and an associated Quantity in stock. Management wants to identify which products have zero stock so they can be restocked.

Write a Python program using the pandas library to help with this task. The program should:

Read the number of products, n.Read n lines, each containing the Name of the product and its Quantity, separated by a space.Convert this data into a pandas DataFrame.Identify and display the Name and Quantity of products with zero stock.If no products have zero stock, display: No products with zero stock.

Input Format

The first line contains an integer n, the number of products.

The next n lines each contain:

<Product_ID> <Quantity>

where <Product_ID> is a single word (e.g., "Shampoo") and <Quantity> is a non-negative integer (e.g., 5).

Output Format

The first line of output prints:

Products with Zero Stock:

If there are any products with zero stock, the following lines print the pandas DataFrame showing those products with two columns: Product_ID and Quantity.

The column headers Product_ID and Quantity are printed in the second line.

Each subsequent line shows the product's name and quantity, aligned under the respective headers, with no index column.

The output formatting (spacing and alignment) follows the default pandas to_string(index=False) style.

If no products have zero stock, print:

No products with zero stock.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 3
P101 10
P102 0
P103 5
Output: Products with Zero Stock:
Product_ID Quantity
    P102   0

Answer

```python
import pandas as pd

n = int(input())
data = [input().split() for _ in range(n)]

df = pd.DataFrame(data, columns=["Product_ID", "Quantity"])
df["Quantity"] = df["Quantity"].astype(int)

zero_stock = df[df["Quantity"] == 0]

print("Products with Zero Stock:")
if zero_stock.empty:
    print("No products with zero stock.")
else:
    print(zero_stock.to_string(index=False))
```

Status : Correct   *Marks : 10/10*