Rajalakshmi Engineering College

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NeoColab_REC_CS23221_Python Programming

REC_Python_Week 5_MCQ

Attempt : 1
Total Mark : 20
Marks Obtained : 18

Section 1 : MCQ

1. 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*

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

Answer

t[3] = 45

Status : Correct   *Marks : 1/1*

3. 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

TypeError: unsupported operand type

Status : Wrong   *Marks : 0/1*

4. 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*

5. 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*

6. 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*

7. What will be the output?

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

Answer

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

Status : Correct   *Marks : 1/1*

8. 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*

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

Answer

( )

Status : Correct   *Marks : 1/1*

10. 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*

11. 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

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

Status : Wrong   *Marks : 0/1*

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

Answer

False

Status : Correct

Marks : 1/1

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 is a Python tuple?

Answer

(1, 2, 3)

Status : Correct

Marks : 1/1

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

Answer

Values of a dictionary must be unique

Status : Correct

Marks : 1/1

16. 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

17. 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*

18. 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*

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

Answer

Keys must be integers

Status : Correct   *Marks : 1/1*

20. 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*

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REC_Python_Week 5_COD

Attempt : 1
Total Mark : 50
Marks Obtained : 50

Section 1 : Coding

1. 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

```
n = int(input())
list1 = list(map(int, input().split(',')))
list2 = list(map(int, input().split(',')))

sum_tuple = tuple(a + b for a, b in zip(list1, list2))

print(sum_tuple)
```

Status : Correct   *Marks : 10/10*

2.   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

You are using Python

```
N = int(input())
items = []
for _ in range(N):
    item = eval(input())
    items.append(item)

threshold = int(input())

result = []
for _, quantities in items:
    filtered = filter(lambda x: x > threshold, quantities)
    result.extend(filtered)

print(' '.join(map(str, result)))
```

Status : Correct   *Marks : 10/10*

3. 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())

sales_summary = {}

for _ in range(n):
    data = list(map(int, input().split()))
    customer_id = data[0]
    expenditures = data[1:]
    total = sum(expenditures)
    maximum = max(expenditures)
    sales_summary[customer_id] = [total, maximum]

print(sales_summary)
```

Status : Correct   *Marks : 10/10*

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

```
# You are using Python
registered = set(map(int, input().split()))
attended = set(map(int, input().split()))
dropped_out = set(map(int, input().split()))

registered_and_attended = registered & attended
```

```
print(registered_and_attended)

final_students = registered_and_attended - dropped_out
print(final_students)
```

Status : Correct   *Marks : 10/10*

5. 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

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

frequency = {}

for _ in range(n):
    product_id = int(input())
    frequency[product_id] = frequency.get(product_id, 0) + 1

unique_count = len(frequency)

total_occurrences = sum(frequency.values())
average_frequency = total_occurrences / unique_count

print(frequency)
print(f"Total Unique IDs: {unique_count}")
print(f"Average Frequency: {average_frequency:.2f}")
```

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

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

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

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

2. 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

```python
# You are using Python
numbers = input().split()

seen = set()
unique_numbers = []

for num in numbers:
    if num not in seen:
        seen.add(num)
        unique_numbers.append(num)

result = ''.join(unique_numbers)
print(result)
```

Status : Correct   *Marks : 10/10*

3.   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())

event_ids = sorted(int(input()) for _ in range(n))

current_group = [event_ids[0]]

for i in range(1, n):
    if event_ids[i] == event_ids[i - 1] + 1:
        current_group.append(event_ids[i])
    else:
        if len(current_group) == 1:
            print(f"({current_group[0]})")
        else:
            print(tuple(current_group))
        current_group = [event_ids[i]]

if len(current_group) == 1:
    print(f"({current_group[0]})")
else:
    print(tuple(current_group))
```

Status : Correct   *Marks : 10/10*

4. 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
initial_numbers = list(map(int, input().split()))
num_set = set(initial_numbers)

ch = int(input())

def print_custom_set(s):
    sorted_list = sorted(s, reverse=True)
    formatted = ', '.join(str(x) for x in sorted_list)
    print(f"{{{formatted}}}")

print_custom_set(num_set)

if ch == 1:
    print(max(num_set))
elif ch == 2:
    print(min(num_set))
elif ch == 3:
    n1 = int(input())
    num_set.discard(n1)
    print_custom_set(num_set)
else:
    print("Invalid choice")
```

Status : Correct   *Marks : 10/10*

5. 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())

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

pairs = []

for i in range(n-1):
    pairs.append((elements[i], elements[i+1]))

pairs.append((elements[-1], None))

print(tuple(pairs))
```

Status : Correct   *Marks : 10/10*

6. 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
def is_prime(num):
    if num < 2:
        return False
    if num == 2:
        return True
    if num % 2 == 0:
        return False
    for i in range(3, int(num**0.5) + 1, 2):
        if num % i == 0:
            return False
    return True

n = int(input())
```

```python
prime_dict = {}
count = 0
number = 2

while count < n:
    if is_prime(number):
        count += 1
        prime_dict[count] = number
    number += 1

print(prime_dict)
```

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 : 36.5

Section 1 : Coding

1. Problem Statement

Alex is tasked with managing the membership lists of several exclusive clubs. Each club has its own list of members, and Alex needs to determine the unique members who are part of exactly one club when considering all clubs together.

Your goal is to help Alex by writing a program that calculates the symmetric difference of membership lists from multiple clubs and then finds the total number of unique members.

Input Format

The first line of input consists of an integer k, representing the number of clubs.

The next k lines each contain a space-separated list of integers, where each

integer represents a member's ID.

Output Format

The first line of output displays the symmetric difference of the membership lists as a set.

The second line displays the sum of the elements in this symmetric difference.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 3
1 2 3
2 3 4
5 6 7
Output: {1, 4, 5, 6, 7}
23

Answer

```python
# You are using Python
from collections import Counter
from itertools import chain

k = int(input())
clubs = [set(map(int, input().split())) for _ in range(k)]

all_members = Counter(chain.from_iterable(clubs))


unique_members = {member for member, count in all_members.items() if count == 1}


print(unique_members)
print(sum(unique_members))
```

Status : Partially correct   *Marks : 6.5/10*

2. Problem Statement

James is an engineer working on designing a new rocket propulsion system. He needs to solve a quadratic equation to determine the optimal launch trajectory. The equation is of the form $ax^2 + bx + c = 0$.

Your task is to help James find the roots of this quadratic equation. Depending on the discriminant, the roots might be real and distinct, real and equal, or complex. Implement a program to determine and display the roots of the equation based on the given coefficients.

Input Format

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

The second line contains three space-separated integers a,b, and c representing the coefficients of the quadratic equation.

Output Format

The output displays:

1. If the discriminant is positive, display the two real roots.
2. If the discriminant is zero, display the repeated real root.
3. If the discriminant is negative, display the complex roots as a tuple with real and imaginary parts.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 3
1 5 6
Output: (-2.0, -3.0)

Answer

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

```
a, b, c = map(int, input().split())

D = b**2 - 4*a*c

if D > 0:
    root1 = (-b + math.sqrt(D)) / (2*a)
    root2 = (-b - math.sqrt(D)) / (2*a)
    print((root1, root2))
elif D == 0:
    root = -b / (2*a)
    print((root, root))
else:
    real_part = -b / (2*a)
    imag_part = math.sqrt(-D) / (2*a)
    print(((real_part, imag_part), (real_part, -imag_part)))
```

Status : Correct   *Marks : 10/10*

3.   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
def find_largest_population_increase():
    N = int(input())
    max_increase = -1
    country_code = ""

    for _ in range(N):
        code = input().strip()
        pop_year1 = int(input())
        pop_year2 = int(input())

        increase = pop_year2 - pop_year1

        if increase > max_increase:
            max_increase = increase
```

```
    country_code = code

  print(f"{{{country_code}:{max_increase}}}")

find_largest_population_increase()
```

Status : Correct   *Marks : 10/10*

4. Problem Statement

Alex is working with grayscale pixel intensities from an old photo that has
been scanned in a single row. To detect edges in the image, Alex needs to
calculate the differences between each pair of consecutive pixel
intensities.

Your task is to write a program that performs this calculation and returns
the result as a tuple of differences.

Input Format

The first line of input contains an integer n, representing the number of pixel
intensities.

The second line contains n space-separated integers representing the pixel
intensities.

Output Format

The output displays a tuple containing the absolute differences between
consecutive pixel intensities.

Refer to the sample output for format specifications.

Sample Test Case

Input: 5
200 100 20 80 10
Output: (100, 80, 60, 70)

Answer

```python
# You are using Python
def calculate_pixel_differences():
    n = int(input())
    pixels = list(map(int, input().split()))
    differences = tuple(abs(pixels[i] - pixels[i + 1]) for i in range(n - 1))
    print(differences)
calculate_pixel_differences()
```

Status : Correct   *Marks : 10/10*