TUPLE

✓ Question 1

Write a Python program to convert a tuple to a string.

```
tup = ('P', 'Y', 'T', 'H', 'O', 'N')

result = ''.join(tup)
print("String:", result)
```

✓ Question 2

Write a Python program to find repeated items in a tuple.

```
tup = (1, 2, 3, 2, 4, 5, 1, 6)

repeated = set()
for item in tup:
    if tup.count(item) > 1:
        repeated.add(item)
print("Repeated items:", repeated)
```

✓ Question 3

Write a Python program to check whether an element exists within a tuple.

```
tup = (10, 20, 30, 40, 50)

element = int(input("Enter element to search: "))
if element in tup:
    print("Element exists in tuple.")else:
    print("Element does not exist in tuple.")
```

✓ Question 4

Write a Python program to convert a tuple to a dictionary.

```
tup = (('a', 1), ('b', 2), ('c', 3))

result = dict(tup)
print("Dictionary:", result)
```

✓ Question 5

Write a Python program to reverse a tuple.

```
tup = (1, 2, 3, 4, 5)

reversed_tup = tup[::-1]
print("Reversed tuple:", reversed_tup)
```

✓ Question 6

Write a Python program to replace the last value of tuples in a list.

Sample:
```
[(10, 20, 40), (40, 50, 60), (70, 80, 90)]
```
Expected Output:
```
[(10, 20, 100), (40, 50, 100), (70, 80, 100)]
```

```
list_of_tuples = [(10, 20, 40), (40, 50, 60), (70, 80, 90)]

result = []
for t in list_of_tuples:
    new_tuple = t[:-1] + (100,)
    result.append(new_tuple)
print("Updated list:", result)
```

✓ Question 7

Remove empty tuple(s) from a list of tuples.

Given Data:
```
[(), (), ('',), ('a', 'b'), ('a', 'b', 'c'), ('d')]
```
Expected Output:
```
[('',), ('a', 'b'), ('a', 'b', 'c'), ('d',)]
```

```
data = [(), (), ('',), ('a', 'b'), ('a', 'b', 'c'), ('d',)]

result = []
```

```
for item in data:
    if item != ():
        result.append(item)
print("After removing empty tuples:", result)
```

✓ Question 8

Sort a tuple by its float element.

Given Data:
`[('item1', '12.20'), ('item2', '15.10'), ('item3', '24.5')]`
Expected Output:
`[('item3', '24.5'), ('item2', '15.10'), ('item1', '12.20')]`

```
data = [('item1', '12.20'), ('item2', '15.10'), ('item3', '24.5')]

sorted_data = sorted(data, key=lambda x: float(x[1]), reverse=True)
print("Sorted tuple:", sorted_data)
```

✓ Question 9

Calculate average value of numbers in a tuple of tuples.

First Given Data:

```
data = ((10, 10, 10, 12),
        (30, 45, 56, 45),
        (81, 80, 39, 32),
        (1, 2, 3, 4))

result = []
for i in range(len(data[0])):
    column_sum = 0
    for row in data:
        column_sum += row[i]
    result.append(column_sum / len(data))
print("Average values:", result)
```

Second Given Data:

```
data = ((1, 1, -5),
        (30, -15, 56),
```

```
        (81, -60, -39),
        (-10, 2, 3))

result = []
for i in range(len(data[0])):
    column_sum = 0
    for row in data:
        column_sum += row[i]
    result.append(column_sum / len(data))
print("Average values:", result)
```

✓ Question 10

Convert tuple of string values to tuple of integer values.

Given Data:
```
(('333', '33'), ('1416', '55'))
```
Expected Output:
```
((333, 33), (1416, 55))
```

```
data = (('333', '33'), ('1416', '55'))

result = []
for inner in data:
    temp = []
    for value in inner:
        temp.append(int(value))
    result.append(tuple(temp))

result = tuple(result)
print("Converted tuple:", result)
```

✓ Question 11

Convert a given tuple of positive integers into a single integer.

First Given Data:

$(1, 2, 3) \rightarrow 123$

```
data = (1, 2, 3)

result = ""
```

```
for num in data:
    result += str(num)
print("Converted integer:", int(result))
```

Second Given Data:

(10, 20, 40, 5, 70) → 102040570

```
data = (10, 20, 40, 5, 70)

result = ""
for num in data:
    result += str(num)
print("Converted integer:", int(result))
```

✓ Question 12

Check if a specified element appears in a tuple of tuples.

Given Data:

```
data = (('Red', 'White', 'Blue'),
        ('Green', 'Pink', 'Purple'),
        ('Orange', 'Yellow', 'Lime'))

element = input("Enter element to search: ")

found = False
for inner in data:
    if element in inner:
        found = True
        break
print("Result:", found)
```

✓ Question 13

Compute the element-wise sum of given tuples.

Given Data:

(1, 2, 3, 4)
(3, 5, 2, 1)
(2, 2, 3, 1)

```
t1 = (1, 2, 3, 4)
t2 = (3, 5, 2, 1)
t3 = (2, 2, 3, 1)

result = []
for i in range(len(t1)):
    result.append(t1[i] + t2[i] + t3[i])
print("Element-wise sum:", tuple(result))
```

✓ Question 14

Compute sum of all elements of each tuple stored inside a list of tuples.

First Given Data:

```
data = [(1, 2), (2, 3), (3, 4)]

result = []
for tup in data:
    total = 0
    for num in tup:
        total += num
    result.append(total)
print("Sum of each tuple:", result)
```

Second Given Data:

```
data = [(1, 2, 6), (2, 3, -6), (3, 4), (2, 2, 2, 2)]

result = []
for tup in data:
    total = 0
    for num in tup:
        total += num
    result.append(total)
print("Sum of each tuple:", result)
```

✓ Question 15

Convert a given list of tuples to a list of lists.

First Given Data:

```
data = [(1, 2), (2, 3), (3, 4)]

result = []
for tup in data:
    result.append(list(tup))
print("Converted list:", result)
```

Second Given Data:

```
data = [(1, 2), (2, 3, 5), (3, 4), (2, 3, 4, 2)]

result = []
for tup in data:
    result.append(list(tup))
print("Converted list:", result)
```

LIST

✓ Question 1

Find the second smallest number in a list.

```
numbers = [10, 20, 4, 45, 99]

unique_numbers = list(set(numbers))
unique_numbers.sort()
if len(unique_numbers) >= 2:
    print("Second smallest:", unique_numbers[1])else:
    print("Second smallest does not exist.")
```

✓ Question 2

Find the second largest number in a list.

```
numbers = [10, 20, 4, 45, 99]

unique_numbers = list(set(numbers))
unique_numbers.sort()
if len(unique_numbers) >= 2:
    print("Second largest:", unique_numbers[-2])else:
    print("Second largest does not exist.")
```

✓ Question 3

Get unique values from a list.

```
numbers = [1, 2, 2, 3, 4, 4, 5]

unique_values = list(set(numbers))
print("Unique values:", unique_values)
```

✓ Question 4

Get the frequency of elements in a list.

```
numbers = [1, 2, 2, 3, 4, 4, 4, 5]

frequency = {}
for num in numbers:
    frequency[num] = frequency.get(num, 0) + 1
print("Frequencies:", frequency)
```

✓ Question 5

Check whether a list contains a sublist.

```
main_list = [1, 2, 3, 4, 5]
sub_list = [3, 4]

found = False
for i in range(len(main_list) - len(sub_list) + 1):
    if main_list[i:i+len(sub_list)] == sub_list:
        found = True
        break
print("Sublist exists:", found)
```

✓ Question 6

Change position of every n-th value to (n+1)th in a list.
Sample: [0,1,2,3,4,5] → [1,0,3,2,5,4]

```
numbers = [0, 1, 2, 3, 4, 5]
for i in range(0, len(numbers)-1, 2):
    numbers[i], numbers[i+1] = numbers[i+1], numbers[i]
print("Updated list:", numbers)
```

✓ Question 7

Insert an element before each element of a list.

```
numbers = [1, 2, 3, 4]

new_element = 0
result = []
for num in numbers:
```

```
    result.append(new_element)
    result.append(num)
print("Updated list:", result)
```

✓ Question 8

Convert two lists into a list of dictionaries.

Given Data:

```
color_names = ["Black", "Red", "Maroon", "Yellow"]
color_codes = ["#000000", "#FF0000", "#800000", "#FFFF00"]

result = []
for i in range(len(color_names)):
    temp = {}
    temp['color_name'] = color_names[i]
    temp['color_code'] = color_codes[i]
    result.append(temp)
print("Result:", result)
```

✓ Question 9

Compute difference between two lists.

Given Data:

```
list1 = ["red", "orange", "green", "blue", "white"]
list2 = ["black", "yellow", "green", "blue"]

color1_color2 = []
color2_color1 = []
for item in list1:
    if item not in list2:
        color1_color2.append(item)
for item in list2:
    if item not in list1:
        color2_color1.append(item)
print("Color1-Color2:", color1_color2)print("Color2-Color1:",
color2_color1)
```

✓ Question 10

Move all zero digits to the end of a list.

Given Data:

```
numbers = [3, 4, 0, 0, 0, 6, 2, 0, 6, 7, 6, 0, 0, 0, 9, 10, 7, 4, 4, 5, 3, 0, 0, 2, 9, 7, 1]

non_zero = []
zero = []
for num in numbers:
    if num == 0:
        zero.append(num)
    else:
        non_zero.append(num)

result = non_zero + zero
print("After moving zeros:", result)
```

✓ Question 11

Find the list in a list of lists whose sum is highest.

Given Data:

```
data = [[1,2,3], [4,5,6], [10,11,12], [7,8,9]]

max_sum = 0
max_list = []
for lst in data:
    total = sum(lst)
    if total > max_sum:
        max_sum = total
        max_list = lst
print("List with highest sum:", max_list)
```

✓ Question 12

Find items starting with a specific character.

Given Data:

```
data = ['abcd', 'abc', 'bcd', 'bkie', 'cder', 'cdsw', 'sdfsd',
'dagfa', 'acjd']

ch = input("Enter starting character: ")

result = []
for item in data:
    if item.startswith(ch):
        result.append(item)
print("Items starting with", ch, ":", result)
```

✓ Question 13

Flatten a given nested list structure.

Given Data:

```
data = [0, 10, [20, 30], 40, 50, [60, 70, 80], [90, 100, 110, 120]]

result = []
for item in data:
    if isinstance(item, list):
        for num in item:
            result.append(num)
    else:
        result.append(item)
print("Flatten list:", result)
```

✓ Question 14

Remove consecutive duplicates from a list.

Given Data:

```
data = [0, 0, 1, 2, 3, 4, 4, 5, 6, 6, 6, 7, 8, 9, 4, 4]

result = [data[0]]
for i in range(1, len(data)):
    if data[i] != data[i-1]:
        result.append(data[i])
```

```
print("After removing consecutive duplicates:", result)
```

✓ Question 15

Remove the K-th element from a list.

Given Data:

```
data = [1, 1, 2, 3, 4, 4, 5, 1]

k = int(input("Enter position to remove (1-based index): "))
if 1 <= k <= len(data):
    data.pop(k-1)
    print("Updated list:", data)else:
    print("Invalid position.")
```

✓ Question 16

Insert an element at K-th position in a list.

Given Data:

```
data = [1, 1, 2, 3, 4, 4, 5, 1]

k = int(input("Enter position to insert (1-based index): "))
value = int(input("Enter value to insert: "))
if 1 <= k <= len(data)+1:
    data.insert(k-1, value)
    print("Updated list:", data)else:
    print("Invalid position.")
```

✓ Question 17

Find difference between consecutive numbers in a list.

First Given Data:

```
data = [1, 1, 3, 4, 4, 5, 6, 7]

result = []
```

```
for i in range(1, len(data)):
    result.append(data[i] - data[i-1])
print("Difference list:", result)
```

Second Given Data:

```
data = [4, 5, 8, 9, 6, 10]

result = []
for i in range(1, len(data)):
    result.append(data[i] - data[i-1])
print("Difference list:", result)
```

✓ Question 18

Reverse each list in a given list of lists.

Given Data:

```
data = [[1, 2, 3, 4],
        [5, 6, 7, 8],
        [9, 10, 11, 12],
        [13, 14, 15, 16]]

result = []
for lst in data:
    result.append(lst[::-1])
print("Reversed lists:", result)
```

DICTIONARY

✓ Question 1

Create and display all combinations of letters selecting each letter from a different key.

Given Data:

```
{'1':['a','b'], '2':['c','d']}
```

Expected Output: ac, ad, bc, bd

```
data = {'1': ['a', 'b'], '2': ['c', 'd']}
for i in data['1']:
    for j in data['2']:
        print(i + j)
```

✓ Question 2

Find the highest 3 values of corresponding keys in a dictionary.

```
data = {'a': 45, 'b': 12, 'c': 78, 'd': 23, 'e': 90}

sorted_values = sorted(data.values(), reverse=True)
print("Highest 3 values:", sorted_values[:3])
```

✓ Question 3

Combine values in a list of dictionaries.

Given Data:

```
data = [
    {'item': 'item1', 'amount': 400},
    {'item': 'item2', 'amount': 300},
    {'item': 'item1', 'amount': 750}
]

result = {}
for d in data:
```

```
    key = d['item']
    value = d['amount']

    if key in result:
        result[key] += value
    else:
        result[key] = value
print("Combined values:", result)
```

✓ Question 4

Get the top three items in a shop.

Given Data:

```
data = {'item1': 45.50, 'item2': 35, 'item3': 41.30, 'item4': 55,
'item5': 24}

sorted_items = sorted(data.items(), key=lambda x: x[1], reverse=True)
print("Top three items:")for item in sorted_items[:3]:
    print(item[0], item[1])
```

✓ Question 5

Drop empty items from a dictionary.

Given Data:

```
data = {'c1': 'Red', 'c2': 'Green', 'c3': None}

result = {}
for key, value in data.items():
    if value is not None:
        result[key] = value
print("After dropping empty items:", result)
```

✓ Question 6

Filter dictionary based on values (marks > 170).

Given Data:

```
data = {
    'Cierra Vega': 175,
    'Alden Cantrell': 180,
    'Kierra Gentry': 165,
    'Pierre Cox': 190
}

result = {}
for key, value in data.items():
    if value > 170:
        result[key] = value
print("Marks greater than 170:", result)
```

✓ Question 7

Filter height > 6ft and weight > 70kg.

Given Data:

```
data = {
    'Cierra Vega': (6.2, 70),
    'Alden Cantrell': (5.9, 65),
    'Kierra Gentry': (6.0, 68),
    'Pierre Cox': (5.8, 66)
}

result = {}
for key, (height, weight) in data.items():
    if height > 6 and weight > 70:
        result[key] = (height, weight)
print("Filtered students:", result)
```

✓ Question 8

Check whether a given key already exists in a dictionary.

Given Data:

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

```
key = input("Enter key to check: ")
if key in data:
    print("Key exists in dictionary.")else:
    print("Key does not exist.")
```

✓ Question 9

Merge two dictionaries.

Given Data:

```
dict1 = {'a': 100, 'b': 200}
dict2 = {'x': 300, 'y': 400}

merged = dict1.copy()
merged.update(dict2)
print("Merged dictionary:", merged)
```

✓ Question 10

Sum all values in a dictionary.

Given Data:

```
data = {'a': 100, 'b': 200, 'c': 300}

total = 0
for value in data.values():
    total += value
print("Sum of values:", total)
```

✓ Question 11

Multiply all values in a dictionary.

Given Data:

```
data = {'a': 2, 'b': 3, 'c': 4}

result = 1
```

```
for value in data.values():
    result *= value
print("Product of values:", result)
```

✓ Question 12

Remove a key from a dictionary.

Given Data:

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

key = input("Enter key to remove: ")
if key in data:
    data.pop(key)
    print("Updated dictionary:", data)else:
    print("Key not found.")
```

✓ Question 13

Convert two lists into a dictionary.

Given Data:

```
keys = ['a', 'b', 'c']
values = [1, 2, 3]

result = {}
for i in range(len(keys)):
    result[keys[i]] = values[i]
print("Created dictionary:", result)
```