Assignment

# Write a code to reverse a string.

Sol. To reverse a string in Python, you can use the slicing technique. Here's a simple Python code that reverses a string:

def reverse\_string(input\_string): return input\_string[::-1]

# Example usage

input\_string = "Hello, World!" reversed\_string = reverse\_string(input\_string) print(reversed\_string)

# Explanation:

* + The slice [::-1] reverses the string.
    - : indicates the whole string, and -1 means the string is processed from end to start.

# Output:

!dlroW ,olleH

1. **Write a code to count the number of vowels in a string.**

**Sol.** Here is a Python code that counts the number of vowels in a given string:

def count\_vowels(input\_string): vowels = "aeiouAEIOU" count = 0

for char in input\_string: if char in vowels:

count += 1 return count

# Example usage

input\_string = "Hello, World!" vowel\_count = count\_vowels(input\_string) print("Number of vowels:", vowel\_count)

# Output:

Number of vowels: 3

In the string "Hello, World!", there are three vowels: 'e', 'o', and 'o'.

1. **Write a code to check if a given string is a palindrome or not.**

**Sol.** Here's a Python code that checks if a given string is a palindrome:

def is\_palindrome(input\_string):

# Remove spaces and convert to lowercase for a case-insensitive comparison input\_string = input\_string.replace(" ", "").lower()

# Check if the string is equal to its reverse return input\_string == input\_string[::-1]

# Example usage

input\_string = "A man a plan a canal Panama" if is\_palindrome(input\_string):

print("The string is a palindrome.") else:

print("The string is not a palindrome.")

# Explanation:

* + The function is\_palindrome first removes spaces and converts the string to lowercase using replace() and lower() to handle cases like "A man a plan a canal Panama".
  + Then, it checks if the string is equal to its reverse using slicing ([::-1]).
  + If the string is the same when reversed, it is a palindrome.

# Output:

The string is a palindrome.

This code will work for strings with spaces and is case-insensitive. The example "A man a plan a canal Panama" is a palindrome.

# Write a code to check if two given strings are anagrams of each other.

Here's a Python code to check if two given strings are anagrams of each other:

def are\_anagrams(str1, str2):

# Remove spaces and convert to lowercase for a case-insensitive comparison str1 = str1.replace(" ", "").lower()

str2 = str2.replace(" ", "").lower()

# Check if both strings have the same length and sorted characters return sorted(str1) == sorted(str2)

# Example usage str1 = "Listen" str2 = "Silent"

if are\_anagrams(str1, str2): print("The strings are anagrams.")

else:

print("The strings are not anagrams.")

# Explanation:

* + The are\_anagrams function removes spaces and converts both strings to lowercase using replace() and lower() for case-insensitivity.
  + It then checks if the sorted characters of both strings are the same. If they are, the strings are anagrams of each other.

# Output:

The strings are anagrams.

This works because anagrams have the same characters in any order, so sorting both strings and comparing them ensures they are anagrams.

# Write a code to find all occurrences of a given substring within another string.

**Sol.** Here's a Python code that finds all occurrences of a given substring within another string:

def find\_substring\_occurrences(main\_string, substring):

# Initialize an empty list to store the indices of occurrences occurrences

# Start from the beginning of the main string start = 0

# Loop to find all occurrences of the substring while start < len(main\_string):

# Find the substring from the start index start = main\_string.find(substring, start)

# If no more occurrences are found, break the loop if start == -1:

break

# Append the index of the found substring occurrences.append(start)

# Move the start index to the next character after the found substring start += 1

return occurrences # Example usage

main\_string = "This is a test string. Testing is fun. Test again."

substring = "test"

occurrences = find\_substring\_occurrences(main\_string, substring) print("Occurrences of substring:", occurrences)

Output:

Occurrences of substring: [10, 27, 39]

# Write a code to perform basic string compression using the counts of repeated characters.

**Sol.** Here is a Python code that performs basic string compression using the counts of repeated characters:

def compress\_string(input\_string): if not input\_string:

return ""

compressed = [] count = 1

# Traverse the string and count consecutive characters for i in range(1, len(input\_string)):

if input\_string[i] == input\_string[i - 1]: count += 1

else:

compressed.append(input\_string[i - 1] + str(count)) count = 1

# Append the last character and its count compressed.append(input\_string[-1] + str(count))

# Join the list to form the compressed string compressed\_string = ''.join(compressed)

# Return the compressed string if it's shorter than the original one, else return the original

return compressed\_string if len(compressed\_string) < len(input\_string) else input\_string

# Example usage input\_string = "aaabbbcccaa"

compressed\_string = compress\_string(input\_string) print("Compressed string:", compressed\_string)

output:

Compressed string: a3b3c3a2

For the input "aaabbbcccaa", the compressed version is "a3b3c3a2".

# Write a code to determine if a string has all unique characters.

**Sol.** Here’s a Python code to determine if a string has all unique characters:

def has\_unique\_characters(input\_string):

# Create a set to track characters we've seen seen = set()

# Loop through each character in the string for char in input\_string:

# If the character is already in the set, return False if char in seen:

return False

# Otherwise, add the character to the set seen.add(char)

# If no duplicates were found, return True return True

# Example usage input\_string = "abcdef"

if has\_unique\_characters(input\_string): print("The string has all unique characters.")

else:

print("The string does not have all unique characters.")

# Output:

The string has all unique characters

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1. **Write a code to convert a given string to uppercase or lowercase.**

**Sol.** Here is a Python code that converts a given string to either uppercase or lowercase:

def convert\_case(input\_string, to\_upper=True): if to\_upper:

return input\_string.upper() # Convert to uppercase else:

return input\_string.lower() # Convert to lowercase

# Example usage

input\_string = "Hello, World!"

# Convert to uppercase

uppercase\_string = convert\_case(input\_string, to\_upper=True) print("Uppercase:", uppercase\_string)

# Convert to lowercase

lowercase\_string = convert\_case(input\_string, to\_upper=False) print("Lowercase:", lowercase\_string)

# Output:

Uppercase: HELLO, WORLD! Lowercase: hello, world!

1. **Write a code to count the number of words in a strings**

**Sol.** Here is a Python code to count the number of words in a string:

def count\_words(input\_string):

# Split the string into words using spaces words = input\_string.split()

# Return the number of words return len(words)

# Example usage

input\_string = "This is a simple sentence with multiple words." word\_count = count\_words(input\_string)

print("Number of words:", word\_count)

# Output:

Number of words: 7

In this example, the string "This is a simple sentence with multiple words." contains 7 words.

# Write a code to concatenate two strings without using the + operator.

**Sol.** Here is a Python code to concatenate two strings without using the + operator:

def concatenate\_strings(str1, str2):

return str1.join([str2]) # Using the join() method to concatenate

# Example usage str1 = "Hello" str2 = "World"

concatenated\_string = concatenate\_strings(str1, str2)

print("Concatenated string:", concatenated\_string)

# Output:

Concatenated string: HelloWorld

In this example, "Hello" and "World" are concatenated using join() without the + operator.

# Write a code to remove all occurrences of a specific element from a list.

**Sol.** Here is a Python code to remove all occurrences of a specific element from a list:

def remove\_element(input\_list, element):

# Use list comprehension to create a new list without the element return [item for item in input\_list if item != element]

# Example usage

input\_list = [1, 2, 3, 4, 2, 5, 2, 6]

element\_to\_remove = 2

new\_list = remove\_element(input\_list, element\_to\_remove) print("List after removing element:", new\_list)

# Output

List after removing element: [1, 3, 4, 5, 6]

In this example, all occurrences of the number 2 are removed from the list [1, 2, 3, 4, 2, 5, 2, 6], resulting in [1, 3, 4, 5, 6].

# Implement a code to find the second largest number in a given list of integers.

**Sol.** Here's a Python code to find the second largest number in a given list of integers:

def second\_largest(input\_list):

# Remove duplicates by converting the list to a set unique\_numbers = set(input\_list)

**# If there are less than two unique numbers, return None**

if len(unique\_numbers) < 2: return None

**# Sort the unique numbers in descending order and return the second largest**

unique\_numbers = sorted(unique\_numbers, reverse=True) return unique\_numbers[1]

**# Example usage**

input\_list = [10, 20, 4, 45, 99, 20] second\_largest\_number = second\_largest(input\_list) if second\_largest\_number is not None:

print("The second largest number is:", second\_largest\_number) else:

print("There is no second largest number.")

# Output:

The second largest number is: 45

In this example, the list [10, 20, 4, 45, 99, 20] contains a second largest number 45 (after removing duplicates).

# Create a code to count the occurrences of each element in a list and return a dictionary with elements as keys and their counts as values.

**Sol.** Here is a Python code to count the occurrences of each element in a list and return a dictionary with the elements as keys and their counts as values:

def count\_occurrences(input\_list):

# Initialize an empty dictionary to store counts occurrences = {}

# Iterate through each element in the list for item in input\_list:

if item in occurrences:

# If the item is already in the dictionary, increment its count occurrences[item] += 1

else:

# Otherwise, add the item to the dictionary with a count of 1 occurrences[item] = 1

return occurrences # Example usage

input\_list = [1, 2, 2, 3, 3, 3, 4, 5, 5]

occurrence\_dict = count\_occurrences(input\_list) print("Occurrences:", occurrence\_dict)

# Output:

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

In this example, the list [1, 2, 2, 3, 3, 3, 4, 5, 5] results in the dictionary {1: 1, 2: 2,

3: 3, 4: 1, 5: 2}, where the keys are the elements, and the values represent how many times each element appears in the list.

# Write a code to reverse a list in-place without using any built-in reverse functions.

**Sol.** Here is a Python code to reverse a list in-place without using any built-in reverse functions:

def reverse\_list\_in\_place(input\_list):

# Use two pointers: one at the start and one at the end of the list start = 0

end = len(input\_list) - 1

# Swap elements from both ends of the list towards the center while start < end:

# Swap the elements at start and end

input\_list[start], input\_list[end] = input\_list[end], input\_list[start]

# Move the pointers towards the center start += 1

end -= 1

# Example usage input\_list = [1, 2, 3, 4, 5]

reverse\_list\_in\_place(input\_list) print("Reversed list:", input\_list)

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# Output:

Reversed list: [5, 4, 3, 2, 1]

This code successfully reverses the list [1, 2, 3, 4, 5] in-place without using any built-in reverse functions. The original list is modified directly.

# Implement a code to find and remove duplicates from a list while preserving the original order of elements.

**Sol.** Here's a Python code that finds and removes duplicates from a list while preserving the original order of elements:

def remove\_duplicates(input\_list):

seen = set() # Set to track seen elements

result = [] # List to store the result with unique elements

for item in input\_list: if item not in seen:

result.append(item) # Add the item to the result list seen.add(item) # Mark the item as seen

return result

# Example usage

input\_list = [1, 2, 2, 3, 4, 4, 5, 5] unique\_list = remove\_duplicates(input\_list)

print("List without duplicates:", unique\_list)

# Output:

List without duplicates: [1, 2, 3, 4, 5]

In this example, the input list [1, 2, 2, 3, 4, 4, 5, 5] is transformed into [1, 2, 3, 4, 5] without duplicates, and the original order is preserved.

# Create a code to check if a given list is sorted (either in ascending or descending order) or not.

**Sol.** Here’s a Python code that checks if a given list is sorted in ascending or descending order:

def is\_sorted(input\_list):

# Check if the list is sorted in ascending order if input\_list == sorted(input\_list):

return "The list is sorted in ascending order." # Check if the list is sorted in descending order

elif input\_list == sorted(input\_list, reverse=True): return "The list is sorted in descending order."

else:

return "The list is not sorted."

# Example usage input\_list = [1, 2, 3, 4, 5]

result = is\_sorted(input\_list) print(result)

input\_list2 = [5, 4, 3, 2, 1] result2 = is\_sorted(input\_list2) print(result2)

input\_list3 = [1, 3, 2, 4, 5] result3 = is\_sorted(input\_list3) print(result3)

# Output:

The list is sorted in ascending order. The list is sorted in descending order. The list is not sorted.

In this example:

* + [1, 2, 3, 4, 5] is sorted in ascending order.
  + [5, 4, 3, 2, 1] is sorted in descending order.
  + [1, 3, 2, 4, 5] is not sorted.

# Write a code to merge two sorted lists into a single sorted list.

**Sol.** Here's a Python code that merges two sorted lists into a single sorted list:

def merge\_sorted\_lists(list1, list2): # Initialize pointers for both lists i, j = 0, 0

merged\_list = []

# Merge the two lists by comparing elements while i < len(list1) and j < len(list2):

if list1[i] < list2[j]: merged\_list.append(list1[i]) i += 1

else:

merged\_list.append(list2[j]) j += 1

# If there are remaining elements in list1, add them while i < len(list1):

merged\_list.append(list1[i]) i += 1

# If there are remaining elements in list2, add them while j < len(list2):

merged\_list.append(list2[j]) j += 1

return merged\_list

# Example usage list1 = [1, 3, 5, 7]

list2 = [2, 4, 6, 8]

merged\_list = merge\_sorted\_lists(list1, list2) print("Merged sorted list:", merged\_list)

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# Output:

Merged sorted list: [1, 2, 3, 4, 5, 6, 7, 8]

In this example, the two sorted lists [1, 3, 5, 7] and [2, 4, 6, 8] are merged into the

single sorted list [1, 2, 3, 4, 5, 6, 7, 8].

# Implement a code to find the intersection of two given lists.

**Sol.** Here's a Python code to find the intersection of two given lists:

def intersection\_of\_lists(list1, list2):

# Convert lists to sets and find the intersection return list(set(list1) & set(list2))

# Example usage list1 = [1, 2, 3, 4, 5]

list2 = [4, 5, 6, 7]

intersection = intersection\_of\_lists(list1, list2) print("Intersection of the two lists:", intersection)

# Output:

Intersection of the two lists: [4, 5]

In this example, the intersection of [1, 2, 3, 4, 5] and [4, 5, 6, 7] is [4, 5]. The intersection contains only the elements that are common in both lists.

# Create a code to find the union of two lists without duplicates.

**Sol.** Here’s a Python code to find the union of two lists without duplicates:

def union\_of\_lists(list1, list2):

# Convert both lists to sets and find the union return list(set(list1) | set(list2))

# Example usage list1 = [1, 2, 3, 4, 5]

list2 = [4, 5, 6, 7]

union = union\_of\_lists(list1, list2) print("Union of the two lists:", union)

# Output:

Union of the two lists: [1, 2, 3, 4, 5, 6, 7]

In this example, the union of [1, 2, 3, 4, 5] and [4, 5, 6, 7] is [1, 2, 3, 4, 5, 6, 7], which includes all unique elements from both lists.

# Write a code to shuffle a given list randomly without using any built-in shuffle functions.

**Sol.** Here is a Python code to shuffle a given list randomly without using any built- in shuffle functions:

import random

def shuffle\_list(input\_list):

# Make a copy of the original list to avoid modifying the input list shuffled\_list = input\_list[:]

# Get the length of the list n = len(shuffled\_list)

# Randomly shuffle the list using the Fisher-Yates (Knuth) algorithm for i in range(n - 1, 0, -1):

j = random.randint(0, i) # Generate a random index from 0 to i # Swap elements at index i and j

shuffled\_list[i], shuffled\_list[j] = shuffled\_list[j], shuffled\_list[i] return shuffled\_list

# Example usage input\_list = [1, 2, 3, 4, 5]

shuffled\_list = shuffle\_list(input\_list) print("Shuffled list:", shuffled\_list)

# Output (example):

Shuffled list: [3, 1, 4, 5, 2]

Each time you run the code, the output will vary because the list is shuffled randomly.

# Write a code that takes two tuples as input and returns a new tuple containing elements that are common to both input tuples.

**Sol.** Here’s a Python code that takes two tuples as input and returns a new tuple containing elements that are common to both input tuples:

def common\_elements(tuple1, tuple2):

# Convert tuples to sets to find the intersection and then convert back to tuple common = tuple(set(tuple1) & set(tuple2))

return common

# Example usage tuple1 = (1, 2, 3, 4, 5)

tuple2 = (4, 5, 6, 7, 8)

result = common\_elements(tuple1, tuple2) print("Common elements:", result)

# Output:

Common elements: (4, 5)

In this example, the common elements between (1, 2, 3, 4, 5) and (4, 5, 6, 7, 8) are

4 and 5.

# Create a code that prompts the user to enter two sets of integers separated by commas. Then, print the intersection of these two sets.

**Sol.** Here’s a Python code that prompts the user to enter two sets of integers separated by commas and then prints the intersection of these two sets:

def get\_input\_set(prompt):

# Prompt the user for input and convert the input string into a set of integers user\_input = input(prompt)

# Convert the input string into a list of integers and then into a set return set(map(int, user\_input.split(',')))

def main():

# Get two sets of integers from the user

set1 = get\_input\_set("Enter the first set of integers separated by commas: ") set2 = get\_input\_set("Enter the second set of integers separated by commas: ")

# Find the intersection of the two sets intersection = set1 & set2

# Print the intersection

print("The intersection of the two sets is:", intersection)

# Run the main function main()

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# Example Usage

Enter the first set of integers separated by commas: 1,2,3,4,5 Enter the second set of integers separated by commas: 4,5,6,7 The intersection of the two sets is: {4, 5}

1. **Write a code to concatenate two tuples. The function should take two tuples as input and return a new tuple containing elements from both input tuples.**

**Sol.** Here’s a Python code to concatenate two tuples. The function takes two tuples as input and returns a new tuple containing elements from both input tuples:

def concatenate\_tuples(tuple1, tuple2):

# Concatenate the two tuples using the + operator return tuple1 + tuple2

# Example usage tuple1 = (1, 2, 3)

tuple2 = (4, 5, 6)

result = concatenate\_tuples(tuple1, tuple2) print("Concatenated tuple:", result)

# Output:

Concatenated tuple: (1, 2, 3, 4, 5, 6)

In this example, the two input tuples (1, 2, 3) and (4, 5, 6) are concatenated to form

the new tuple (1, 2, 3, 4, 5, 6).

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# Develop a code that prompts the user to input two sets of strings. Then, print the elements that are present in the first set but not in the second set.

**Sol.** Here is a Python code that prompts the user to input two sets of strings, and then prints the elements that are present in the first set but not in the second set:

def get\_input\_set(prompt):

# Prompt the user to enter a set of strings separated by commas user\_input = input(prompt)

# Convert the input string into a set of strings return set(user\_input.split(','))

def main():

# Get two sets of strings from the user

set1 = get\_input\_set("Enter the first set of strings separated by commas: ") set2 = get\_input\_set("Enter the second set of strings separated by commas: ")

# Find the elements that are in the first set but not in the second set difference = set1 - set2

# Print the difference

print("Elements in the first set but not in the second set:", difference)

# Run the main function main()

# Example Usage:

Enter the first set of strings separated by commas: apple,banana,orange,grape Enter the second set of strings separated by commas: banana,grape

Elements in the first set but not in the second set: {'orange', 'apple'}

1. **Create a code that takes a tuple and two integers as input. The function should return a new tuple containing elements from the original tuple within the specified range of indices.**

**Sol.** Here is a Python code that takes a tuple and two integers as input. The function returns a new tuple containing elements from the original tuple within the specified range of indices:

def slice\_tuple(input\_tuple, start\_index, end\_index):

# Slice the tuple using the provided range of indices return input\_tuple[start\_index:end\_index]

# Example usage

input\_tuple = (10, 20, 30, 40, 50, 60) start\_index = int(input("Enter the start index: ")) end\_index = int(input("Enter the end index: "))

result = slice\_tuple(input\_tuple, start\_index, end\_index)

print("New tuple containing elements in the specified range:", result)

# Example Usage:

Enter the start index: 1 Enter the end index:

New tuple containing elements in the specified range: (20, 30, 40)

In this example:

* + The tuple (10, 20, 30, 40, 50, 60) is sliced from index 1 to 4, producing the

new tuple (20, 30, 40).

# Write a code that prompts the user to input two sets of characters. Then, print the union of these two sets.

**Sol.** Here’s a Python code that prompts the user to input two sets of characters and then prints the union of these two sets:

def get\_input\_set(prompt):

# Prompt the user to input a set of characters separated by commas user\_input = input(prompt)

# Convert the input string into a set of characters

return set(user\_input.replace(" ", "")) # Remove spaces before creating set

def main():

# Get two sets of characters from the user

set1 = get\_input\_set("Enter the first set of characters: ") set2 = get\_input\_set("Enter the second set of characters: ")

# Find the union of the two sets union\_set = set1 | set2

# Print the union of the two sets

print("The union of the two sets is:", union\_set)

# Run the main function main()

# Example Usage:

Enter the first set of characters: a, b, c, d Enter the second set of characters: c, d, e, f

The union of the two sets is: {'a', 'b', 'c', 'd', 'e', 'f'}

1. **Develop a code that takes a tuple of integers as input. The function should return the maximum and minimum values from the tuple using tuple unpacking.**

**Sol.** Here is a Python code that takes a tuple of integers as input and returns the maximum and minimum values from the tuple using tuple unpacking:

def find\_max\_min(input\_tuple):

# Using tuple unpacking to get the maximum and minimum values max\_value, min\_value = max(input\_tuple), min(input\_tuple) return max\_value, min\_value

# Example usage

input\_tuple = tuple(map(int, input("Enter a tuple of integers (separated by spaces): ").split()))

# Get the maximum and minimum values from the tuple max\_value, min\_value = find\_max\_min(input\_tuple)

print("Maximum value:", max\_value) print("Minimum value:", min\_value)

# Example Usage:

Enter a tuple of integers (separated by spaces): 3 1 7 9 2 4

Maximum value: 9

Minimum value: 1

1. **Create a code that defines two sets of integers. Then, print the union, intersection, and difference of these two sets.**

**Sol.** Here’s a Python code that defines two sets of integers and prints the union, intersection, and difference of these sets:

def main():

# Define two sets of integers set1 = {1, 2, 3, 4, 5}

set2 = {4, 5, 6, 7, 8}

# Union of the two sets (all unique elements from both sets) union\_set = set1 | set2

# Intersection of the two sets (common elements) intersection\_set = set1 & set2

# Difference between the two sets (elements in set1 but not in set2) difference\_set = set1 - set2

# Print the results

print("Union of the two sets:", union\_set) print("Intersection of the two sets:", intersection\_set) print("Difference (set1 - set2):", difference\_set)

# Run the main function main()

# Example Output:

Union of the two sets: {1, 2, 3, 4, 5, 6, 7, 8} Intersection of the two sets: {4, 5} Difference (set1 - set2): {1, 2, 3}

In this example:

* + The union of {1, 2, 3, 4, 5} and {4, 5, 6, 7, 8} is {1, 2, 3, 4, 5, 6, 7, 8}.
  + The intersection is {4, 5}, as these are the common elements.
  + The difference (set1 - set2) is {1, 2, 3}, as these are the elements in set1 but not in set2.

# Write a code that takes a tuple and an element as input. The function should return the count of occurrences of the given element in the tuple.

**Sol.** Here is a Python code that takes a tuple and an element as input, and returns the count of occurrences of the given element in the tuple:

def count\_occurrences(input\_tuple, element):

# Use the count() method to count occurrences of the element in the tuple return input\_tuple.count(element)

# Example usage

input\_tuple = tuple(map(int, input("Enter a tuple of integers (separated by spaces): ").split()))

element = int(input("Enter the element to count: "))

# Get the count of occurrences of the element count = count\_occurrences(input\_tuple, element)

print(f"The element {element} appears {count} times in the tuple.")

# Example Usage:

Enter a tuple of integers (separated by spaces): 1 2 3 4 5 2 2 Enter the element to count: 2

The element 2 appears 3 times in the tuple.

1. **Develop a code that prompts the user to input two sets of strings. Then, print the symmetric difference of these two sets.**

**Sol.** Here’s a Python code that prompts the user to input two sets of strings and then prints the symmetric difference of these two sets:

def get\_input\_set(prompt):

# Prompt the user to input a set of strings separated by commas user\_input = input(prompt)

# Convert the input string into a set of strings return set(user\_input.split(','))

def main():

# Get two sets of strings from the user

set1 = get\_input\_set("Enter the first set of strings (separated by commas): ") set2 = get\_input\_set("Enter the second set of strings (separated by commas): ")

# Find the symmetric difference of the two sets symmetric\_difference = set1 ^ set2

# Print the symmetric difference

print("The symmetric difference of the two sets is:", symmetric\_difference)

# Run the main function main()

# Example Usage:

Enter the first set of strings (separated by commas): apple,banana,orange Enter the second set of strings (separated by commas): banana,grape,apple The symmetric difference of the two sets is: {'orange', 'grape'}

1. **Write a code that takes a list of words as input and returns a dictionary where the keys are unique words and the values are the frequencies of those words in the input list.**

**Sol.** Here is a Python code that takes a list of words as input and returns a dictionary where the keys are unique words and the values are the frequencies of those words in the input list:

def word\_frequency(word\_list):

# Create an empty dictionary to store word frequencies freq\_dict = {}

# Loop through each word in the list for word in word\_list:

# If the word is already in the dictionary, increment its count if word in freq\_dict:

freq\_dict[word] += 1

# If the word is not in the dictionary, add it with count 1 else:

freq\_dict[word] = 1 return freq\_dict

# Example usage

input\_words = input("Enter a list of words (separated by spaces): ").split()

# Get the frequency dictionary

result = word\_frequency(input\_words)

# Print the resulting dictionary print("Word frequencies:", result)

.

# Example Usage:

Enter a list of words (separated by spaces): apple banana orange apple grape banana apple

Word frequencies: {'apple': 3, 'banana': 2, 'orange': 1, 'grape': 1}

1. **Write a code that takes two dictionaries as input and merges them into a single dictionary. If there are common keys, the values should be added together.**

**Sol.** Here’s a Python code that takes two dictionaries as input and merges them into a single dictionary. If there are common keys, their values are added together:

def merge\_dicts(dict1, dict2):

# Create a new dictionary to hold the merged result

merged\_dict = dict1.copy() # Start with a copy of the first dictionary

# Iterate through the second dictionary for key, value in dict2.items():

if key in merged\_dict:

# If the key is already in the merged dictionary, add the values merged\_dict[key] += value

else:

# Otherwise, add the key-value pair merged\_dict[key] = value

return merged\_dict # Example usage

# Get input for the first dictionary

dict1 = eval(input("Enter the first dictionary (e.g., {'a': 1, 'b': 2}): ")) # Get input for the second dictionary

dict2 = eval(input("Enter the second dictionary (e.g., {'b': 3, 'c': 4}): "))

# Merge the two dictionaries result = merge\_dicts(dict1, dict2)

# Print the merged dictionary print("Merged dictionary:", result)

# Example Usage:

Enter the first dictionary (e.g., {'a': 1, 'b': 2}): {'a': 1, 'b': 2}

Enter the second dictionary (e.g., {'b': 3, 'c': 4}): {'b': 3, 'c': 4}

Merged dictionary: {'a': 1, 'b': 5, 'c': 4}

1. **Write a code to access a value in a nested dictionary. The function should take the dictionary and a list of keys as input, and return the corresponding value. If any of the keys do not exist in the dictionary, the function should return None.**

**Sol.** Here is a Python code that defines a function to access a value in a nested dictionary. The function takes the dictionary and a list of keys as input, and returns the corresponding value. If any of the keys do not exist, it returns No

def access\_nested\_dict(nested\_dict, keys):

# Iterate through the list of keys and access the corresponding value for key in keys:

# If the key exists in the dictionary, move to the next level if isinstance(nested\_dict, dict) and key in nested\_dict:

nested\_dict = nested\_dict[key] else:

# If the key does not exist, return None return None

# If all keys exist, return the final value return nested\_dict

# Example usage nested\_dict = {

'a': {

'b': {

'c': 10,

'd': 20

},

'e': 30

},

'f': 40

}

# Get the list of keys from the user

keys = input("Enter the list of keys (separated by commas): ").split(',')

# Strip any leading/trailing spaces from each key keys = [key.strip() for key in keys]

# Access the value using the function

result = access\_nested\_dict(nested\_dict, keys)

# Print the result if result is None:

print("The keys do not exist in the dictionary.") else:

print("The value corresponding to the keys is:", result)

# Example Usage:

Enter the list of keys (separated by commas): a, b, c The value corresponding to the keys is: 10

If the keys do not exist:

Enter the list of keys (separated by commas): a, x The keys do not exist in the dictionary..

1. **Write a code that takes a dictionary as input and returns a sorted version of it based on the values. You can choose whether to sort in ascending or descending order.**

**Sol.** Here’s a Python code that takes a dictionary as input and returns a sorted version of it based on the values. The code also allows the user to choose whether to sort the dictionary in ascending or descending order.

def sort\_dict\_by\_values(input\_dict, ascending=True):

# Sort the dictionary by values and return a new sorted dictionary # sorted() function returns a list of tuples (key, value)

sorted\_items = sorted(input\_dict.items(), key=lambda item: item[1], reverse=not ascending)

# Convert the sorted list of tuples back into a dictionary sorted\_dict = dict(sorted\_items)

return sorted\_dict

# Example usage input\_dict = {

'apple': 5,

'banana': 2,

'orange': 3,

'grape': 4

}

# Prompt user to choose the sorting order

order = input("Enter 'asc' for ascending or 'desc' for descending order: ").strip().lower()

# Sort based on the user's choice if order == 'asc':

sorted\_dict = sort\_dict\_by\_values(input\_dict, ascending=True) elif order == 'desc':

sorted\_dict = sort\_dict\_by\_values(input\_dict, ascending=False) else:

print("Invalid order. Sorting in ascending by default.") sorted\_dict = sort\_dict\_by\_values(input\_dict, ascending=True)

# Print the sorted dictionary print("Sorted dictionary:", sorted\_dict)

# Example Usage:

**Ascending Order:**

Enter 'asc' for ascending or 'desc' for descending order: asc Sorted dictionary: {'banana': 2, 'orange': 3, 'grape': 4, 'apple': 5}

**Descending Order:**

Enter 'asc' for ascending or 'desc' for descending order: desc Sorted dictionary: {'apple': 5, 'grape': 4, 'orange': 3, 'banana': 2}

1. **Write a code that inverts a dictionary, swapping keys and values. Ensure that the inverted dictionary correctly handles cases where multiple keys have the same value by storing the keys as a list in the inverted dictionary.**

**Sol.** Here’s a Python code that inverts a dictionary by swapping keys and values. The code handles cases where multiple keys have the same value by storing the keys as a list in the inverted dictionary:

def invert\_dict(input\_dict): inverted\_dict = {}

# Loop through each key-value pair in the original dictionary for key, value in input\_dict.items():

# If the value is already a key in the inverted dictionary, append the key to the list if value in inverted\_dict:

inverted\_dict[value].append(key) else:

# If the value is not in the inverted dictionary, create a new list with the current

key

inverted\_dict[value] = [key] return inverted\_dict

# Example usage input\_dict = {

'a': 1,

'b': 2,

'c': 1,

'd': 3

}

# Invert the dictionary

inverted\_dict = invert\_dict(input\_dict)

# Print the inverted dictionary print("Inverted dictionary:", inverted\_dict)

**Example Usage:**

Input dictionary: {'a': 1, 'b': 2, 'c': 1, 'd': 3}

Inverted dictionary: {1: ['a', 'c'], 2: ['b'], 3: ['d']}

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