Sample Coding Questions

Lists

#Lists are used to store multiple items in a single variable.

#Lists are created using square brackets.

List items are ordered, changeable, and allow duplicate values.

List items are indexed, the first item has index [0], the second item has index [1] etc.

```
myData = ["Student1", "Student2", "Student3"]
print(myData)

print(len(myData))

print(type(myData))
```

```
#using list()
thislist = list(("abc", "xyz", "mno")) # note the double round-brackets
print(thislist)
```

```
myList = [9, 10, 11]
myList.append(12)
print(myList)
```

```
List1 = ["a", "b", "c"]
List2 = ["m", "p", "y"]
List1.extend(List2)
print(List1)


myData = ["Milk", "Tea", "Coffee", "Sugar", "Bread"]
print(myData)

myData[1] = "Black Tea"
print(myData)

myData[1:3] = ["Black Tea", "Cold Coffee"]
print(myData)

myData[1:2] = ["D1", "D2"]
print(myData)

myData[1:3] = ["myNewData"]
print(myData)

myData.insert(3, "Soft Drink")
print(myData)
```

```
newList = ["apple", "banana", "cherry"]
finalList = newList.copy()
print(finalList)
```

```
newList = ["apple", "banana", "cherry"]
finalList = list(newList)
print(finalList)
```

```
list1 = ["a", "b", "c"]
list2 = [1, 2, 3]

list3 = list1 + list2
print(list3)
```

```
list1 = ["a", "b" , "c"]
list2 = [1, 2, 3]

for x in list2:
  list1.append(x)

print(list1)
```

```
list1 = ["a", "b" , "c"]
```

```
list2 = [1, 2, 3]


list1.extend(list2)
print(list1)



myList = ["GLA", "Sharda", "LPU", "Amity", "Delhi University", "Galgotias",
"CU"]
print(myList[1]) #The first item has index 0.


print(myList[-1]) #-1 refers to the last item, -2 refers to the second last item etc.


print(myList[2:5])


print(myList[:4])


print(myList[2:])


print(myList[-4:-1])


if "GLA" in myList:
  print("Yes!")
```

```
myData1 = ["orange", "mango", "kiwi", "pineapple", "banana"]
myData1.sort()
print(myData1)


myData2 = [100, 50, 65, 82, 23]
myData2.sort()
print(myData2)


myData3 = ["orange", "mango", "kiwi", "pineapple", "banana"]
myData3.sort(reverse = True)
print(myData3)

myData4 = [100, 50, 65, 82, 23]
myData4.sort(reverse = True)
print(myData4)


myData5 = ["banana", "Orange", "Kiwi", "cherry"]
myData5.reverse()
print(myData5) #["cherry", "kiwi", .....]


myData = ["a", "b", "c"]
for x in myData:
```

```
    print(x)



myData1 = ["a", "b", "c"]
for i in range(len(myData1)):
  print(myData1[i])



myData2 = ["a", "b", "c"]
i = 0
while i < len(myData2):
  print(myData2[i])
  i = i + 1



myData3 = ["d", "e", "f"]
[print(x) for x in myData3]



veg = ["cabbage", "potato", "brinjal", "tomato"]
newlist = []

for x in veg:
  if "o" in x:
    newlist.append(x)
```

```
print(newlist)



veg = ["cabbage", "potato", "brinjal", "tomato"]

newlist1 = [x for x in veg if "o" in x]

print(newlist1)



myList = ["a", "b", "c"]
myList.remove("b")
print(myList)    #["a", "c"]

myList1 = ["a", "b", "c"]
myList1.pop(1)
print(myList1) #["a", "c"]

myList2 = ["a", "b", "c"]
myList2.pop()
print(myList2) #["a", "b"]

myList3 = ["a", "b", "c"]
del myList3[0]
```

```
print(myList3)  #["b", "c"]

# myList4 = ["a", "b", "c"]
# del myList4
# print(myList4)  #shows error as already deleted

myList5 = ["a", "b", "c"]
myList5.clear()
print(myList5)



#a concise way to create lists
squares = [x ** 2 for x in range(5)]
print(squares)


even_numbers = [x for x in range(10) if x % 2 == 0]
print(even_numbers)


results = ['Pass' if score >= 60 else 'Fail' for score in [75, 30, 85, 50]]
print(results)


names = ['John', 'Jane', 'Jim']
```

```
name_lengths = [len(name) for name in names]
print(name_lengths)



#Problem Statement: Take the inputs from the user and add the items in the list
#and print the final list

# Initialize an empty list
my_list = []

# Get the number of items to add to the list from the user
num_items = int(input("Enter the number of items to add to the list: "))

# Get the items from the user and add them to the list
for i in range(num_items):
    item = input(f"Enter item {i+1}: ")
    my_list.append(item)

# Print the final list
print("Final List:", my_list)
```

#Problem Statement: Take the inputs from the user and add the items in the list

#without using the append() function and print the final list

```
num_elements = int(input("Enter the number of elements to add to the list: "))
original_list = [0] * num_elements
print("Original List:", original_list)

for i in range(num_elements):
    #element = int(input(f"Enter element {i+1}: "))
    element = input(f"Enter element {i+1}: ")
    original_list[i] = element

print("Finally the list:", original_list)
```

 # You are given a list numbers containing integers.

#Your task is to perform the following operations:

 # Access and print the element at index 3.

 # Access and print the last element of the list.

 # Access and print a sublist containing elements from index 1 to 4 (inclusive).

 # Change the value at index 2 to 10.

 # Append the value 20 to the end of the list.

 # Remove the element at index 0.

 # Insert the value 5 at index 1.

 # Print the final list.

```
# Initialize the list
numbers = [1, 3, 5, 7, 9, 11, 13, 15]

# Access and print element at index 3
print(f"Element at index 3: {numbers[3]}")

# Access and print the last element
print(f"Last element: {numbers[-1]}")

# Access and print sublist from index 1 to 4 (inclusive)
sublist = numbers[1:5]
print(f"Sublist from index 1 to 4: {sublist}")

# Change the value at index 2 to 10
numbers[2] = 10
print(f"Modified list after changing element at index 2: {numbers}")

# Append the value 20 to the end of the list
numbers.append(20)
print(f"List after appending 20: {numbers}")

# Remove the element at index 0
del numbers[0]
print(f"List after removing element at index 0: {numbers}")

# Insert the value 5 at index 1
```

```
numbers.insert(1, 5)
print(f"List after inserting 5 at index 1: {numbers}")

# Print the final list
print(f"Final List: {numbers}")
```

 # Question 1: Find the Sum of Elements in a List

Problem Statement: Write a program to find the sum of all elements in a given list.

```
my_list = [1, 2, 3, 4, 5]
sum_of_elements = 0

for num in my_list:
    sum_of_elements += num

print(f"The sum of elements in the list is: {sum_of_elements}")
```

 # Question 2: Find the Largest Element in a List

Problem Statement: Write a program to find the largest element in a given list.

```
my_list = [12, 34, 90, 67, 3, 1]
max_element = my_list[0]

for num in my_list:
```

```
    if num > max_element:
        max_element = num

print(f"The largest element in the list is: {max_element}")

# Question 3: Count Occurrences of an Element in a List
# Problem Statement: Write a program to count the number of occurrences
#of a specific element in a list.

my_list = [1, 2, 3, 4, 2, 2, 3, 5, 2]
element_to_count = 2
count = 0

for num in my_list:
    if num == element_to_count:
        count += 1

print(f"The element {element_to_count} occurs {count} times in the list.")

# Question 4: Reverse a List
# Problem Statement: Write a program to reverse a given list.

my_list = []

num_items = int(input("Enter the number of items to add to the list: "))
```

```
for i in range(num_items):
    item = input(f"Enter item {i+1}: ")
    my_list.append(item)

print("Final List:", my_list)
# my_list = [1, 2, 3, 4, 5]
reversed_list = []

for i in range(len(my_list) - 1, -1, -1):
    reversed_list.append(my_list[i])

print(f"The reversed list is: {reversed_list}")
```

 # Question 5: Check if a List is Palindrome

```
# Problem Statement: Write a program to check if a given list is a palindrome
#(reads the same forwards and backwards).

my_list = []

num_items = int(input("Enter the number of items to add to the list: "))

for i in range(num_items):
    item = input(f"Enter item {i+1}: ")
    my_list.append(item)
```

```
print("Final List:", my_list)
# my_list = [1, 2, 3, 2, 1]
is_palindrome = True

for i in range(len(my_list)//2):
    if my_list[i] != my_list[-i-1]:
        is_palindrome = False
        break

if is_palindrome:
    print("The list is a palindrome.")
else:
    print("The list is not a palindrome.")



#for i in range(len(my_list)//2): ->
# This is a for loop that iterates over half of the elements in the list.
# It uses range(len(my_list)//2) to loop from the first element to the middle element
# of the list.

# if my_list[i] != my_list[-i-1]: ->
# Inside the loop, this line compares the i-th element from the beginning of
#  the list with the -i-1-th element from the end of the list.
# This comparison checks if the elements at symmetric positions in the list
# are not equal.
```

```
# For example, in the first iteration, it compares my_list[0]
# with my_list[-1] (the first and last elements).
# In the second iteration, it compares my_list[1] with my_list[-2]
# (the second and second-to-last elements), and so on.
```

 # Question 6: Find the Second Largest Element in a List

Problem Statement: Write a program to find the second largest element in a given list.

```
my_list = [12, 34, 55, 67, 45, 90]

# Initialize max_element and second_max to the first and second elements of the list
max_element = my_list[0]
second_max = my_list[1]

# Ensure max_element contains the larger of the two elements
if second_max > max_element:
    max_element, second_max = second_max, max_element

for num in my_list[2:]:  # Start loop from the third element
    if num > max_element:
        second_max = max_element
        max_element = num
    elif max_element > num > second_max:
        second_max = num
```

```
print(f"The second largest element in the list is: {second_max}")
```

 # Question 7: Remove Duplicates from a List

Problem Statement: Write a program to remove duplicate elements from a list.

```
my_list = [1, 2, 3, 2, 1, 4, 5, 4, 6]
unique_list = []

for num in my_list:
    if num not in unique_list:
        unique_list.append(num)

print(f"The list after removing duplicates is: {unique_list}")
```

 # Question 8: Find the Intersection (Common elements) of Two Lists

Problem Statement: Write a program to find the intersection of two lists.

```
list1 = [1, 2, 3, 4, 5]
list2 = [3, 4, 5, 6, 7,8]
intersection = []

for num in list1:
    if num in list2 and num not in intersection:
        intersection.append(num)
```

```
print(f"The intersection of the two lists is: {intersection}")
```

 # Question 9: Merge Two Lists

Problem Statement: Write a program to merge two lists into a single list.

```
list1 = [1, 2, 3]
list2 = [4, 5, 6]
merged_list = list1 + list2

print(f"The merged list is: {merged_list}")
```

 # Question 10: Find the Smallest Element in a List

Problem Statement: Write a program to find the smallest element in a given list.

```
my_list = [12, 34, 45, 67, 89, 90]
min_element = my_list[0]

for num in my_list:
    if num < min_element:
        min_element = num

print(f"The smallest element in the list is: {min_element}")
```

 # Question 11: Count Even and Odd Numbers in a List

Problem Statement: Write a program to count the number of even and odd numbers in a list.

```
my_list = [1, 2, 3, 4, 5, 6, 7, 8, 9]
even_count = 0
odd_count = 0

for num in my_list:
    if num % 2 == 0:
        # print(num, end = " ")
        even_count += 1
    else:
        # print(num, end = " ")
        odd_count += 1

print(f"Number of even numbers: {even_count}")
print(f"Number of odd numbers: {odd_count}")
```

 # Question 12: Find the Union (all unique elements from both the lists) of Two Lists

Problem Statement: Write a program to find the union of two lists.

```
list1 = [1, 2, 3, 4, 5]
list2 = [3, 4, 5, 6, 7]
union = []
```

```
for item in list1 + list2:
    if item not in union:
        union.append(item)

print(f"The union of the two lists is: {union}")
```

 # Question 13: Remove Specific Element from a List

Problem Statement: Write a program to remove a specific element from a list.

```
# my_list = [1, 2, 3, 4, 2, 2, 3, 5, 2]
# element_to_remove = 2

# while element_to_remove in my_list:
#     my_list.remove(element_to_remove)

# print(f"The list after removing {element_to_remove} is: {my_list}")

my_list = [1, 2, 3, 4, 2, 2, 3, 5, 2]
element_to_remove = 2

new_list = [item for item in my_list if item != element_to_remove]

print(f"The list after removing {element_to_remove} is: {new_list}")
```

 # Question 14: Find the Difference (Uncommon elements) between Two Lists

Problem Statement: Write a program to find the difference between two lists.

```
list1 = [1, 2, 3, 4, 5]
list2 = [3, 4, 5, 6, 7]

difference = [item for item in list1 + list2 if item not in list1 or item not in list2]

print(f"The difference between the two lists is: {difference}")
```

 # Question 15: Find the Nth Largest Element in a List

Problem Statement: Write a program to find the Nth largest element in a given list.

```
my_list = [12, 34, 45, 67, 89, 90]
n = int(input("Enter the index of the list "))

# Remove duplicates manually
unique_list = []
for num in my_list:
    if num not in unique_list:
        unique_list.append(num)

# Sort the list in descending order
for i in range(len(unique_list)):
    for j in range(i+1, len(unique_list)):
        if unique_list[i] < unique_list[j]:
```

```
            unique_list[i], unique_list[j] = unique_list[j], unique_list[i]

if n <= len(unique_list):
    nth_largest = unique_list[n - 1]
    print(f"The {n}th largest element in the list is: {nth_largest}")
else:
    print(f"There are less than {n} unique elements in the list.")
```

 # Question 16: Sum of even and odd numbers in the list

Problem Statement: Write a program to find the sum of even and odd numbers in the list .

```
my_list = []

num_items = int(input("Enter the number of items to add to the list: "))

for i in range(num_items):
    item = int(input(f"Enter item {i+1}: "))
    my_list.append(item)

print("Final List:", my_list)
# my_list = [1, 2, 3, 4, 5, 6, 7, 8, 9]
sum_even = 0
sum_odd = 0

for num in my_list:
```

```
    if num % 2 == 0:
        # print(num, end = " ")
        #even_count += 1
        sum_even+=num
    else:
        # print(num, end = " ")
        #odd_count += 1
        sum_odd+=num

print(f"Sum of even numbers: {sum_even}")
print(f"Sum of odd numbers: {sum_odd}")
```

 # Question 17: Sum of the squares of even numbers and the sum of the cubes of odd numbers in the list.

```
# Problem Statement: Write a program to find the sum of the squares of
#even numbers and the sum of the cubes of odd numbers in the list.

my_list = []

num_items = int(input("Enter the number of items to add to the list: "))

for i in range(num_items):
    item = int(input(f"Enter item {i+1}: "))
    my_list.append(item)

print("Final List:", my_list)
```

```
sum_even = 0
sum_odd = 0

for num in my_list:
    if num % 2 == 0:
        sum_even+=num**2
    else:
        sum_odd+=num**3

print(f"Sum of even numbers: {sum_even}")
print(f"Sum of odd numbers: {sum_odd}")
```

 # **Problem Statement: Editing List Elements**

You are given a list containing various elements. Your task is to take input from the user regarding the position and text they want to insert at that position.

Write a Python program that performs the following steps:

1. Initialize a list `l` with some initial elements.

2. Prompt the user to enter the position (`index`) where they want to make an edit.

3. Prompt the user to enter the text they want to insert (`inp`).

4. Check if the `index` is within the valid range (0 to `len(l)-1`). If it is, concatenate the existing element at that index with the inputted text.

5. Print the updated list.

Example:

Given list: ["hello", "world", "how", "are you?"]

Enter the position of the element you want to edit: 0

Enter your text: NewText

Updated list: ['hello NewText', 'world', 'how', 'are you?']

Note: Ensure the position entered by the user is within the valid range of indices in the list.

```
l = ["hello", "world", "how", "are you?"]

index = int(input("Enter the position of the element you want to edit: "))
inp = input("Enter your text: ")

# Check if the index is within valid range
if 0 <= index < len(l):
```

```
    l[index] = l[index] + " " + inp


print(l)
```