Python Programming Lab Assignment-2

# Part A: Strings (1–7)

**1. Write a Python program to count the number of vowels and consonants in a given string.  
Answer:**def count\_vowels\_consonants(s):  
 vowels = "aeiouAEIOU"  
 v\_count = sum(1 for ch in s if ch in vowels)  
 c\_count = sum(1 for ch in s if ch.isalpha() and ch not in vowels)  
 return v\_count, c\_count  
  
string = "Hello World"  
print(count\_vowels\_consonants(string))

**2. Given a string, write a program to check whether it is a palindrome or not.  
Answer:**def is\_palindrome(s):  
 return s == s[::-1]  
  
print(is\_palindrome("madam"))  
print(is\_palindrome("python"))

**3. Write a Python program to find the frequency of each character in a string.  
Answer:**def char\_frequency(s):  
 freq = {}  
 for ch in s:  
 freq[ch] = freq.get(ch, 0) + 1  
 return freq  
  
print(char\_frequency("hello world"))

**4. Write a program that accepts a sentence and prints the words in reverse order. (Example: 'I love Python' → 'Python love I')  
Answer:**def reverse\_words(sentence):  
 words = sentence.split()  
 return " ".join(words[::-1])  
  
print(reverse\_words("I love Python"))

**5. Write a Python function that takes a string and returns it without any duplicate characters.  
Answer:**def remove\_duplicates(s):  
 result = ""  
 for ch in s:  
 if ch not in result:  
 result += ch  
 return result  
  
print(remove\_duplicates("programming"))

**6. Write a program to find the longest word in a sentence entered by the user.  
Answer:**def longest\_word(sentence):  
 words = sentence.split()  
 return max(words, key=len)  
  
print(longest\_word("I love programming in Python"))

**7. Write a Python program to check whether two strings are anagrams of each other.  
Answer:**def are\_anagrams(s1, s2):  
 return sorted(s1) == sorted(s2)  
  
print(are\_anagrams("listen", "silent"))  
print(are\_anagrams("hello", "world"))

# Part B: Lists (8–14)

**8. Write a Python program to find the second largest number in a list.  
Answer:**def second\_largest(lst):  
 unique = list(set(lst))  
 unique.sort()  
 return unique[-2]  
  
print(second\_largest([10, 20, 4, 45, 99]))

**9. Write a program to remove all duplicate elements from a list.  
Answer:**def remove\_duplicates\_list(lst):  
 return list(dict.fromkeys(lst))  
  
print(remove\_duplicates\_list([1,2,2,3,4,4,5]))

**10. Write a Python program to reverse a list without using built-in reverse() method.  
Answer:**def reverse\_list(lst):  
 rev = []  
 for i in range(len(lst)-1, -1, -1):  
 rev.append(lst[i])  
 return rev  
  
print(reverse\_list([1,2,3,4,5]))

**11. Write a program to find the sum and average of elements in a list.  
Answer:**def sum\_and\_average(lst):  
 total = sum(lst)  
 avg = total / len(lst)  
 return total, avg  
  
print(sum\_and\_average([1,2,3,4,5]))

**12. Write a program that takes a list of numbers and creates a new list with only the even numbers.  
Answer:**def even\_numbers(lst):  
 return [x for x in lst if x % 2 == 0]  
  
print(even\_numbers([1,2,3,4,5,6]))

**13. Write a Python program to merge two lists and sort the result.  
Answer:**def merge\_and\_sort(l1, l2):  
 return sorted(l1 + l2)  
  
print(merge\_and\_sort([1,3,5], [2,4,6]))

**14. Write a program to find the intersection (common elements) of two lists without using set operations.  
Answer:**def list\_intersection(l1, l2):  
 return [x for x in l1 if x in l2]  
  
print(list\_intersection([1,2,3,4], [3,4,5,6]))

# Part C: Tuples (15–20)

**15. Write a program to create a tuple with different data types and display each element with its type.  
Answer:**tpl = (1, "hello", 3.14, True)  
for item in tpl:  
 print(item, type(item))

**16. Write a Python program to find the maximum and minimum values in a tuple.  
Answer:**tpl = (5, 1, 8, 2, 10)  
print("Max:", max(tpl))  
print("Min:", min(tpl))

**17. Write a program that converts a tuple into a string.  
Answer:**tpl = ('p','y','t','h','o','n')  
s = "".join(tpl)  
print(s)

**18. Write a Python program to check whether an element exists within a tuple or not.  
Answer:**tpl = (1,2,3,4,5)  
print(3 in tpl)  
print(10 in tpl)

**19. Write a program to swap two tuples in Python.  
Answer:**t1 = (1,2,3)  
t2 = (4,5,6)  
t1, t2 = t2, t1  
print("t1:", t1)  
print("t2:", t2)

**20. Write a program to find the index of an element in a tuple and count its occurrence.  
Answer:**tpl = (1,2,3,2,4,2)  
element = 2  
print("Index:", tpl.index(element))  
print("Count:", tpl.count(element))