**Problem 1**

# Write a program to demonstrate the use of different operators in python.  
  
def operators\_demo(a, b):  
 print("Addition:", a + b)  
 print("Subtraction:", a - b)  
 print("Multiplication:", a \* b)  
 print("Division:", a / b if b != 0 else "Undefined")  
 print("Modulus:", a % b if b != 0 else "Undefined")  
 print("Floor Division:", a // b if b != 0 else "Undefined")  
 print("Exponentiation:", a \*\* b)  
 print("Equal:", a == b)  
 print("Not Equal:", a != b)  
 print("Greater:", a > b)  
 print("Smaller:", a < b)  
 print("Logical AND:", a > 0 and b > 0)  
 print("Logical OR:", a > 0 or b > 0)  
 print("Logical NOT:", not(a > 0))  
  
a = int(input("Enter first number: "))  
b = int(input("Enter second number: "))  
operators\_demo(a, b)

**Problem 2**

# Write a program to print Fibonacci Series 0 1 1 2 3 5 ………..N  
  
n = int(input("Enter the number of terms: "))  
a, b = 0, 1  
print("Fibonacci Series:")  
for \_ in range(n):  
 print(a)  
 a, b = b, a + b

**Problem 3**

# Write a program to print the sum of first n prime numbers.  
  
def is\_prime(num):  
 if num < 2:  
 return False  
 for i in range(2, int(num \*\* 0.5) + 1):  
 if num % i == 0:  
 return False  
 return True  
  
n = int(input("Enter Number of Prime Numbers to Sum: "))  
count, num, total = 0, 2, 0  
while count < n:  
 if is\_prime(num):  
 total += num  
 count += 1  
 num += 1  
print("Sum of first", n, "prime numbers is:", total)

**Problem 4**

# Create a function Pall\_n to print all of the palindrome numbers between two ranges.  
  
def is\_palindrome(num):  
 return str(num) == str(num)[::-1]  
  
low = int(input("Enter lower range: "))  
high = int(input("Enter upper range: "))  
  
print("Palindrome numbers are:", end=" ")  
for i in range(low, high + 1):  
 if is\_palindrome(i):  
 print(i, end=" ")

**Problem 5**

# Write a Python program to perform the string slicing.  
  
s = input("Enter a string: ")  
  
while True:  
 print("\n--- String Slicing Menu ---")  
 print("1. First 5 characters")  
 print("2. Last 5 characters")  
 print("3. Characters from index 2 to 7")  
 print("4. Every second character")  
 print("5. Reversed string")  
 print("6. Exit")  
  
 choice = int(input("Enter your choice: "))  
  
 if choice == 1:  
 print("First 5 characters:", s[:5])  
 elif choice == 2:  
 print("Last 5 characters:", s[-5:])  
 elif choice == 3:  
 print("Characters from index 2 to 7:", s[2:8])  
 elif choice == 4:  
 print("Every second character:", s[::2])  
 elif choice == 5:  
 print("Reversed string:", s[::-1])  
 elif choice == 6:  
 print("Exiting program...")  
 break  
 else:  
 print("Invalid choice! Try again.")

**Problem 6**

# Write a Python program to demonstrate the use of List, Tuple, Dictionary.  
  
my\_list = [10, 20, 30, 40]  
my\_tuple = (1, 2, 3, 4)  
my\_dict = {"a": 100, "b": 200, "c": 300}  
  
while True:  
 print("\n--- Data Structure Menu ---")  
 print("1. Show List")  
 print("2. Show Tuple")  
 print("3. Show Dictionary")  
 print("4. Exit")  
  
 choice = int(input("Enter your choice: "))  
  
 if choice == 1:  
 print("List:", my\_list)  
 print("Access List element (index 2):", my\_list[2])  
 elif choice == 2:  
 print("Tuple:", my\_tuple)  
 print("Access Tuple element (index 1):", my\_tuple[1])  
 elif choice == 3:  
 print("Dictionary:", my\_dict)  
 print("Access Dictionary element (key 'b'):", my\_dict["b"])  
 elif choice == 4:  
 print("Exiting program...")  
 break  
 else:  
 print("Invalid choice! Try again.")

**Problem 7**

# Q1: Write a program to perform Linear Search  
  
def linear\_search(arr, target):  
 for i in range(len(arr)):  
 if arr[i] == target:  
 return i  
 return -1  
  
while True:  
 print("\n--- Linear Search Menu ---")  
 print("1. Perform Linear Search")  
 print("2. Exit")  
 choice = int(input("Enter your choice: "))  
  
 if choice == 1:  
 arr = list(map(int, input("Enter numbers separated by space: ").split()))  
 target = int(input("Enter the element to search: "))  
 result = linear\_search(arr, target)  
 if result != -1:  
 print(f"Element found at index {result}")  
 else:  
 print("Element not found")  
 elif choice == 2:  
 print("Exiting program...")  
 break  
 else:  
 print("Invalid choice! Try again.")

**Problem 8**

# Q2: Write a function to find all duplicates in two different lists  
  
def find\_duplicates(list1, list2):  
 duplicates = set(list1).intersection(set(list2))  
 return list(duplicates)  
  
while True:  
 print("\n--- Duplicate Finder Menu ---")  
 print("1. Find Duplicates")  
 print("2. Exit")  
 choice = int(input("Enter your choice: "))  
  
 if choice == 1:  
 list1 = list(map(int, input("Enter elements of first list separated by space: ").split()))  
 list2 = list(map(int, input("Enter elements of second list separated by space: ").split()))  
 duplicates = find\_duplicates(list1, list2)  
 if duplicates:  
 print("Duplicates found:", duplicates)  
 else:  
 print("No duplicates found")  
 elif choice == 2:  
 print("Exiting program...")  
 break  
 else:  
 print("Invalid choice! Try again.")

**Problem 9**

# Q3: Write a function to print the sum of numbers in list having 3 at their units place  
  
def sum\_with\_units\_digit\_3(numbers):  
 return sum(num for num in numbers if num % 10 == 3)  
  
while True:  
 print("\n--- Sum of Numbers Ending with 3 Menu ---")  
 print("1. Calculate Sum")  
 print("2. Exit")  
 choice = int(input("Enter your choice: "))  
  
 if choice == 1:  
 numbers = list(map(int, input("Enter numbers separated by space: ").split()))  
 total = sum\_with\_units\_digit\_3(numbers)  
 print(f"Sum of numbers ending with 3 is: {total}")  
 elif choice == 2:  
 print("Exiting program...")  
 break  
 else:  
 print("Invalid choice! Try again.")