A. Data Structures

1. Write a Python program to remove all duplicates from a list and print the unique elements.

```
initial_list = ["sinjal", "sinjal", "sinjal", "Dahal", "Dahal", "Dahal", "Dahal"]
initial_list_1 = ['a', 'b', 'a', 'b', 'a', 'b', 'c', 'd', 'c', 'd', 'c', 'd']
print(set(initial_list))
print(set(initial_list_1))
```

2. Create a tuple of 10 integers. Write a program to display the maximum and minimum numbers from the tuple.

```
tuple_1 = (1, 2, 3, 4, 5, 6, 7, 8, 9, 10)
max_num = max(tuple_1)
min_num = min(tuple_1)
print("Maximum number in the tuple:", max_num)
print("Minimum number in the tuple:", min_num)
```

3. Write a Python function that accepts a list and returns a new list with only the even numbers from the original list.

```
def filter_even_numbers(numbers):
return [num for num in numbers if num % 2 == 0]
numbers = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
print(filter_even_numbers(numbers))
```

4. Write a program to count the number of each character in a given string using a dictionary.

```
def print_character_positions(input_string):
for index, char in enumerate(input_string, start=1):
```

```
print(f"{char}:{index}", end=", " if index < len(input_string) else "")
user_input = input("Enter a string: ")
print_character_positions(user_input)
```

5. Create a set of prime numbers less than 50. Write a program to check whether a given number exists in the set or not.

```
primes = {2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47}
num = int(input("Enter a number: "))
if num in primes:
print(f"{num} is a prime number less than 50.")
else:
print(f"{num} is not a prime number less than 50.")
```

6. Given two lists, write a program to find their intersection using sets.

```
list1 = [1, 2, 3, 4, 5]
list2 = [4, 5, 6, 7, 8]
intersection = list(set(list1) & set(list2))
print("Intersection:", intersection)
```

7. Write a Python program to merge two dictionaries and sum the values of common keys.

```
def merge_and_sum(dict1, dict2):
merged = dict1.copy()
for key, value in dict2.items():
if key in merged:
merged[key] += value
else:
merged[key] = value
```

```
return merged
dict1 = {'a': 10, 'b': 20, 'c': 30}
dict2 = {'b': 5, 'c': 15, 'd': 25}
result = merge_and_sum(dict1, dict2)
print(result)
```

8. Given a list of names, write a program to count how many times each name appears using a dictionary.

```
names = ['Sinjal', 'Sher', 'Sher', 'Sher', 'Pushpa', 'Sinjal']
name_counts = {}
for name in names:
if name in name_counts:
name_counts[name] += 1
else:
name_counts[name] = 1
print(name_counts)
```

9. Write a Python program to remove elements from a list that are also present in another list.

```
list1 = [1, 2, 3, 4, 5, 6]
list2 = [2, 4, 6]
result = [item for item in list1 if item not in list2]
print("Updated list:", result)
```

10. Write a program to input key-value pairs from the user and store them in a dictionary. Allow the user to search for a key and display its value.

```
data = {}
n = int(input("How many key-value pairs do you want to enter? "))
for _ in range(n):
key = input("Enter key: ")
value = input("Enter value: ")data[key] = value
search_key = input("Enter key to search: ")
if search_key in data:
print(f"Value: {data[search_key]}")
else:
print("Key not found.")
```

B. Conditions and Loops

1. Write a program to check whether a given number is prime or not.

```
num = int(input("Enter a number: "))
if num <= 1:
print(num, "is not a prime number")
else:
i = 2
while i * i <= num:
if num % i == 0:
print(num, "is not a prime number")
break
i += 1
else:
print(num, "is a prime number")
```

2. Write a program to print all the even numbers between 1 and 100 using a loop.

```
for num in range(2, 101, 2):
print(num)
```

3. Write a program that reads a number and prints the factorial of that number using a while loop.

```
num = int(input("Enter a number: "))
factorial = 1
i = 1
while i <= num:
factorial *= i
i += 1
print("Factorial of", num, "is", factorial)
```

4. Write a program to print the multiplication table of a given number using a for loop.

```
num = int(input("Enter a number: "))
for i in range(1, 11):
print(f"{num} x {i} = {num * i}")
```

5. Write a program to find the largest and smallest number in a list entered by the user.

```
numbers = input("Enter numbers : ").split()
numbers = [float(num) for num in numbers]
largest = max(numbers)
smallest = min(numbers)
print("Largest number:", largest)
print("Smallest number:", smallest)
```

6. Write a program that accepts 10 integers from the user and counts how many are positive, negative, and zero.

```
positive_count = 0
negative_count = 0
zero_count = 0
for i in range(10):
num = int(input(f"Enter integer #{i+1}: "))
if num > 0:
positive_count += 1
elif num < 0:
negative_count += 1
else:
zero_count += 1
print("Positive numbers:", positive_count)
print("Negative numbers:", negative_count)
print("Zeros:", zero_count)
```

7. Write a program to generate the Fibonacci sequence up to n terms.

```
n = int(input("Enter the number of terms: "))
fib_sequence = []
a, b = 0, 1
for _ in range(n):
fib_sequence.append(a)
a, b = b, a + b
print("Fibonacci sequence up to", n, "terms:")
print(fib_sequence)
```

8. Write a program that reads a number and prints whether it is a palindrome or not.

```
num = input("Enter a number: ")
if num == num[::-1]:
print("Palindrome")
else:
print("Not a palindrome")
```

9. Write a program that finds all numbers between 100 and 999 where the sum of the cubes of the digits equals the number itself (Armstrong numbers).

```
for num in range(100, 1000):
digits = [int(d) for d in str(num)]
if sum(d ** 3 for d in digits) == num:print(num)
```

10. Write a menu-driven program to perform arithmetic operations (+, -, *, /) based on user choice using conditional statements.

```
def menu():
print("Select operation:")
print("1. Addition (+)")
print("2. Subtraction (-)")
print("3. Multiplication (*)")
print("4. Division (/)")
while True:
menu()
choice = input("Enter choice (1/2/3/4) or 'q' to quit: ")
if choice.lower() == 'q':
print("Exiting program.")
break
if choice not in ('1', '2', '3', '4'):
print("Invalid input. Please try again.")
continue
try:
num1 = float(input("Enter first number: "))
```

```
num2 = float(input("Enter second number: "))
except ValueError:
print("Invalid number. Please try again.")
continue
if choice == '1':
print(f"{num1} + {num2} = {num1 + num2}")
elif choice == '2':
print(f"{num1} - {num2} = {num1 - num2}")
elif choice == '3':
print(f"{num1} * {num2} = {num1 * num2}")
elif choice == '4':
if num2 == 0:
print("Error: Division by zero.")
else:
print(f"{num1} / {num2} = {num1 / num2}")
```

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https://github.com/sinjaldahal/sinjaldahal_BEL