**1)Print the below triangle using for loop.**

**program :**

**i=int(input('enter i'))**

**for j in range (1,i+1):**

**print(j\*str(i))**

**i=i-1**

**Output:**

**5**

**4 4**

**3 3 3**

**2 2 2 2**

**1 1 1 1 1**

**2. Write a program to check whether the given input is digit or lowercase character or uppercase character or a special character (use 'if-else-if' ladder):**

**program:**

**char = input("Enter a character: ")**

**if char.isdigit():**

**print("The input is a digit.")**

**elif char.islower():**

**print("The input is a lowercase character.")**

**elif char.isupper():**

**print("The input is an uppercase character.")**

**else:**

**print("The input is a special character.")**

**output:**

**Enter a character: 5**

**The input is a digit.**

**Enter a character: a**

**The input is a lowercase character.**

**Enter a character: X**

**The input is an uppercase character.**

**Enter a character: !**

**The input is a special character.**

**3. Python Program to Print the Fibonacci sequence using while loop**

**Program:**

**n = int(input("Enter the number of terms: "))**

**a, b = 0, 1**

**if n <= 0:**

**print("Please enter a positive integer.")**

**elif n == 1:**

**print("Fibonacci sequence up to", n, "term:")**

**print(a)**

**else:**

**print("Fibonacci sequence up to", n, "terms:")**

**while n > 0:**

**print(a, end=" ")**

**a = b**

**b = a + b**

**n -= 1**

**output :**

**Enter the number of terms: 10**

**Fibonacci sequence up to 10 terms:**

**0 1 1 2 3 5 8 13 21 34**

**4. Python program to print all prime numbers in a given interval (use break)**

**Program:**

**start = int(input("Enter the start of the interval: "))**

**end = int(input("Enter the end of the interval: "))**

**print("Prime numbers between {start} and {end} are:")**

**for num in range(start, end + 1):**

**if num > 1:**

**for i in range(2, num):**

**if (num % i) == 0:**

**break**

**else:**

**print(num)**

**output:**

**Enter the start of the interval: 10**

**Enter the end of the interval: 50**

**Prime numbers between 10 and 50 are:**

**11**

**13**

**17**

**19**

**23**

**29**

**31**

**37**

**41**

**43**

**47**

**Week - 3:**

**Program:**

1. **Write a program to convert a list and tuple into arrays.**

**Program:**

**import numpy as np**

**my\_list = [1, 2, 3, 4, 5]**

**list\_to\_array = np.array(my\_list)**

**my\_tuple = (6, 7, 8, 9, 10)**

**tuple\_to\_array = np.array(my\_tuple)**

**print("Array from List:")**

**print(list\_to\_array)**

**print("\nArray from Tuple:")**

**print(tuple\_to\_array)**

**output:**

**Array from List:**

**[1 2 3 4 5]**

**Array from Tuple:**

**[ 6 7 8 9 10]**

**ii)Write a program to find common values between two arrays.**

**Program:**

**import numpy as np**

**array1 = np.array([1, 2, 3, 4, 5])**

**array2 = np.array([3, 4, 5, 6, 7])**

**common\_values = np.intersect1d(array1, array2)**

**print("Common values between the two arrays:")**

**print(common\_values)**

**output:**

**Common values between the two arrays:**

**[3 4 5]**

**2) . Write a function called gcd that takes parameters a and b and returns their greatest common divisor**

**program:**

**def gcd(a, b):**

**while b:**

**a, b = b, a % b**

**return a**

**output:**

**The GCD of 48 and 18 is 6**

**3. Write a function called palindrome that takes a string argument and returnsTrue if it is a palindrome and False otherwise. Remember that you can use the built-in function len to check the length of a string**

**program:**

**def palindrome(input\_string):**

**cleaned\_string = input\_string.replace(" ", "").lower()**

**return cleaned\_string == cleaned\_string[::-1]**

**test\_string = "racecar"**

**result = palindrome(test\_string)**

**print(f"'{test\_string}' is a palindrome: {result}")**

**output:**

**'racecar' is a palindrome: True**

**Week - 4:**

1. **Write a function called is\_sorted that takes a list as a parameter and returns True if the list is sorted in ascending order and False otherwise**

**program:**

**def is\_sorted(input\_list):**

**return all(input\_list[i] <= input\_list[i + 1] for i in range(len(input\_list) - 1))**

**my\_list1 = [1, 2, 3, 4, 5]**

**my\_list2 = [5, 3, 2, 1, 0]**

**result1 = is\_sorted(my\_list1)**

**result2 = is\_sorted(my\_list2)**

**print(f"List 1 is sorted: {result1}")**

**print(f"List 2 is sorted: {result2}")**

**. i) Add a comma between the characters. If the given word is 'Apple', it should become 'A,p,p,l,e'**

**program:**

**def add\_comma\_between\_characters(word):**

**return ','.join(word)**

**input\_word = "Apple"**

**result = add\_comma\_between\_characters(input\_word)**

**print(result)**

**output:**

**A,p,p,l,e**

**ii)Remove the given word in all the places in a string?**

**program:**

**def remove\_word\_from\_string(input\_string, word\_to\_remove):**

**result\_string = input\_string.replace(word\_to\_remove, "")**

**return result\_string**

**input\_string = "This is a sample sentence. It is a simple sample."**

**word\_to\_remove = "sample"**

**result = remove\_word\_from\_string(input\_string, word\_to\_remove)**

**print(result)**

**output:**

**This is a sentence. It is a simple .**

**iii)Write a function that takes a sentence as an input parameter and replaces the first letter of every word with the corresponding upper case letter and the rest of the letters in the word by corresponding letters in lower case without using a built-in function?**

**program:**

**def custom\_title\_case(sentence):**

**words = sentence.split()**

**modified\_words = []**

**for word in words:**

**if word:**

**modified\_word = word[0].upper() + word[1:].lower()**

**modified\_words.append(modified\_word)**

**new\_sentence = ' '.join(modified\_words)**

**return new\_sentence**

**input\_sentence = "tHiS Is a SamPle sEntenCe"**

**result = custom\_title\_case(input\_sentence)**

**print(result)**

**output:**

**This Is A Sample Sentence**

**4. Writes a recursive function that generates all binary strings of n-bit length**

**program:**

**def generate\_binary\_strings(n):**

**if n == 0:**

**return ['']**

**smaller\_strings = generate\_binary\_strings(n - 1)**

**new\_strings = []**

**for s in smaller\_strings:**

**new\_strings.append('0' + s)**

**new\_strings.append('1' + s)**

**return new\_strings**

**n = 3**

**binary\_strings = generate\_binary\_strings(n)**

**print(binary\_strings)**

**output:**

**['000', '001', '010', '011', '100', '101', '110', '111']**

**WEEK-5:**

1. i) Write a python program that defines a matrix and prints

**program:**

**Rows = int(input("Give the number of rows:"))**

**Columns = int(input("Give the number of columns:"))**

**example\_matrix = []**

**print("Please give the entries row-wise:")**

**for \_ in range(Rows):**

**r = []**

**for \_\_ in range(Columns):**

**r.append(int(input()))**

**example\_matrix.append(r)**

**for \_ in range(Rows):**

**for \_\_ in range(Columns):**

**print(example\_matrix[\_][\_\_], end=" ")**

**print()**

**OUTPUT:**

**Give the number of rows:3**

**Give the number of columns:3**

**Please give the entries row-wise:**

**1**

**2**

**3**

**44**

**5**

**6**

**7**

**8**

**9**

**1 2 3**

**44 5 6**

**7 8 9**

* + 1. **Write a python program to perform addition of two square matrices**

**PROGRAM:**

**X = [[12,7,3],**

**[4 ,5,6],**

**[7 ,8,9]]**

**Y = [[5,8,1],**

**[6,7,3],**

**[4,5,9]]**

**result = [[0,0,0],**

**[0,0,0],**

**[0,0,0]]**

**for i in range(len(X)):**

**for j in range(len(X[0])):**

**result[i][j] = X[i][j] + Y[i][j]**

**for r in result:**

**print(r)**

**OUTPUT:**

**[17, 15, 4]**

**[10, 12, 9]**

**[11, 13, 18]**

# *a)Start a Python interpreter and use it as a Calculator*

# 

# *Program:*

# *def add(x, y):*

# *return x + y*

# *def subtract(x, y):*

# *return x - y*

# *def multiply(x, y):*

# *return x \* y*

# *def divide(x, y):*

# *return x / y*

# *print("Select operation.")*

# *print("1.Add")*

# *print("2.Subtract")*

# *print("3.Multiply")*

# *print("4.Divide")*

# *while True:*

# *choice = input("Enter choice(1/2/3/4): ")*

# *if choice in ('1', '2', '3', '4'):*

# *try:*

# *num1 = float(input("Enter first number: "))*

# *num2 = float(input("Enter second number: "))*

# *except ValueError:*

# *print("Invalid input. Please enter a number.")*

# *continue*

# *if choice == '1':*

# *print(num1, "+", num2, "=", add(num1, num2))*

# *elif choice == '2':*

# *print(num1, "-", num2, "=", subtract(num1, num2))*

# *elif choice == '3':*

# *print(num1, "\*", num2, "=", multiply(num1, num2))*

# *elif choice == '4':*

# *print(num1, "/", num2, "=", divide(num1, num2)*

# *next\_calculation = input("Let's do next calculation? (yes/no): ")*

# *if next\_calculation == "no":*

# *break*

# *else:*

# *print("Invalid Input")*

# *output:*

**Select operation.**

**1.Add**

**2.Subtract**

**3.Multiply**

**4.Divide**

**Enter choice(1/2/3/4): 1**

**Enter first number: 73**

**Enter second number: 84**

**73.0 + 84.0 = 157.0**

**Let's do next calculation? (yes/no**):