Assignment: - 01/ Introduction to python Program and concept of Data Types

- **A.** Write a
  Python program to show MCKVIE with a print statement and Computer Science & Engineering with another print statement but in the same line.
- **B.** Write a
  Python program to take radius of a circle from the user. Calculate the area and perimeter of the circle and show the values up to 3 decimal points. **E.g.**
  Area = xx.xxx and Perimeter = yy.yyy.

Assignment: - 02/ Concept of Variables and Operators

- **A.** Write a
  python program to swap two variables using and without using third variable (use concept of Tuple Unpacking).
- **B.** Consider
  the basic pay of an employee is given by the user. AGP is 50% of the basic pay. The company provides 50% DA and 15% HRA on the merged basic. Write a python program to calculate and display total salary of the employee.

Assignment: - 03/ Concept of Operators and Conditional Statement

- **A.** Write a
  python program to find the greatest among three numbers.
- **B.** Write a
  python program to check whether a year is Leap Year.
- **C.** In
  general, an equation of the form where a ≠ 0, is known as quadratic equation. Accept the values of a, b, and c from the user and write a python program to calculate the roots of the given quadratic equation.
- **D.** Write a python program which will take a single character from the user and check if the character is a vowel or consonant. If the input is neither a vowel nor consonant, then the code will show it is invalid input.

Assignment: - 05/ Concept of String and string manipulation

- **A.** Consider
  a user given string **s**. write a program to convert uppercase letters into lowercase and lowercase letters into uppercase. Also print the resultant string.
  Input: The Joy Of Computing
  Output: tHE jOY oF cOMPUTING
- **B.**
  Given a student's email id in the following format 11603219005@mckvie.edu.in, write a program to find the roll number and institute name of the student.
  Input: 11603219005@mckvie.edu.in
  Output: 11603219005 MCKVIE

- **C.** Write a
  program that accepts a sentence and calculate the number of upper-case letters
  and lower-case letters.
  Input
  Format: The first line of the input contains a statement.
  Output
  Format: Print the number of upper case and lower case respectively.
  Input:
  Hello world!
  Output:
  1 9
- **D.** Write
  a Python program that takes a sentence and two **positions** as input
  and extract the sub-string between the specified **positions** also check the
  sub-string is a palindrome or not.
  Input: A
  synthetic aperture radar can detect the presence of water and ice.
  22 26
  Output: radar
  palindrome

Assignment: - 06 / Concept of List, Tuple, Set, Dictionaries

- **A.** Given a list of numbers (integers), find second maximum and second minimum in this list.
  Input: 10 11 100 200 300 34
  Output: 200 11
- **B.** Given a list L write a program to make a new list and match the numbers inside list L to its respective index in the new list. Put 0 at remaining indexes. Also print the elements of the new list in the single line.
  Input: [1, 5, 2]
  Output: [0, 1, 2, 0, 0, 5]
- **C.** Take two statements from user as input and show
  a. Unique common words
  b. All unique words
  c. All unique words present in 1st statement but not in second
  Input: Here is Python
  We are learning Python
  Output:
  a. {'Python'}
  b. {'We', 'are', 'learning', 'is', 'Python', 'Here'}
  c. {'is', 'Here'}
- **D.** Take a string as input. Form a dictionary which will have each unique word present in the string as key and frequency of the word as value.
  Input: Python is inspired by Monty Python
  Output: {“Python”: 2, “is”: 1, “inspired”: 1, “by”: 1, “Monty”: 1}
- **E.** Given a list of strings, write a program to write sort the list of strings based on last character of each string.
  Input: ['ram', 'shyam', 'lakshami']

Output: ['lakshami', 'ram', 'shyam']
Input: ['ram', 'sham', 'lakshami']
Output: ['lakshami', 'ram', 'sham']

Assignment: - 07 / Concept of Functions, Recursion and High-level functions

- **A.** Write a recursive function fibo_n(), which will take an integer as input(n) and returns the n-th term of Fibonacci Series. Make sure
  that the default value of n is 1.
- **B.** Write a recursive function fibo_s(), which will take an integer as input(n) and show the Fibonacci Series up to n-terms. Make sure that the default value of n is 1.
- **C.** Use the concept of high-ordered filter function to generate a list of all prime numbers in the range 251 to 5500, in reverse order.
- **D.** Use the concept of lambda function list all the Leap years in the range 2024 to 3010.

Assignment: - 08 / Concept of Modules and Packages

- **A.** Create module called 'numberCheck', with two functions called 'is_prime()' (return true if prime else false) and 'is_palindrome()' (return true if palindrome else false). Import the following module in your source code. Take an integer input in your current source code and call the 'numberCheck' module's functions to check the number is prime and/or Palindrome number or not.
- **B.** Import numpy module in your source code. Create m X n matrix (A) integer by taking user inputs. Also, create a n X m matrix (B) with
  random numbers between 1 to 20. Generate a C matrix where C = A X B. Show the C matrix.

Assignment: - 09 / Concept of Exception Handling: Exception, Exception Handling, except clause, Try- finally clause, User -Defined Exceptions

- A string with parentheses is well formed if all parentheses are matched: every opening bracket has a matching closing bracket and vice versa. Write a Python program to an expression and call a function wellBrackated() which will return True if the input is well bracketed else False. Handle all the exception where required.
  Extra. Implement the above code for parentheses, curly brace, and square bracket.
  Extra. Write a ratotaList() function, Python function which will take 2 parameters as input . 1st parameter is a list which to be rotated, 2nd parameter will be the number times it will be rotated (if <0 Left Rotation else Right Rotation). The function will return a new rotated list.
  The function will raise an exception if the given list is empty, the value of rotations must be less than the number of elements in the list, else it will raise a user define exception and return the original list. By default, number of rotations will be 0.
  Here are some examples to show how your function should work.
  >>> rotateList([1,2,3,4,5], 1)
  [5, 1, 2, 3, 4] #Right Rotation
  >>> rotateList([1,2,3,4,5], -3)
  [4, 5, 1, 2, 3] #Left Rotation

Assignment: - 10 / The Object-Oriented Approach: Classes, Methods, Objects

- **A.** Create a class A.
  Define the constructor which will show "Class A object created". Define a method show (), which will show "Showing Class A". Define a destructor which will delete the object and show "Object deleted!!!".

- **B.** Create a class B. Define the constructor with one argument (integer type) which will show “Class B object created”. Define a method show (), which will show “Showing Class B object having value val1”.
- **C.** Create a class C inheriting class B. Define the constructor which will take two arguments (integer type) which will initialize a class B object with 1st argument and show “Class C object created”. Define a method show (), which will show “Showing Class C with val1, val2.”.
- **D.** Create a class F. Define a constructor which will take one string. Consider x and y are two objects of class F, then if we perform x – y then it will give the characters (in order) present in x but not in y.

Assignment: - 11/ Concept of Files and file handling

- Write a program in python to create a text file and write the text “Welcome to Python” in the file.
- **B.** Write a program in python to store the first n prime numbers in text file.
- **C.** Write program in Python to store Fibonacci numbers between 0 to n, in a text file.
- **D.** Write a program in Python to read line(s) of a text file and display the lines.
- **E.** Write a program in Python to find the size of a file.

Assignment: - 12/ Data Visualization using Python

- Write a Python program to read the sales data from a CSV file (sample.csv) and plot the region-wise total sales in bar graph and pie chart in single figure.