LABORATORY ASSIGNMENT

on

IT Workshop (Python) (PCC-CS393)

Computer Science & Engineering

3RD Semester

1. **A)** Use string slicing to perform the following:
   i. Take a string of length greater than 2, return a string except 1st and last characters.
   ii. Take 2 strings, s1, and s2 return a new string made of the first, middle and last char of each input string.
   iii. Write a python program to take 2 strings, s1 and s2, create a new string by appending s2 in the middle of s1.

   B) Display the marks of two students for 5 subjects using suitable graphical tools.

2. **A)** Write a program to take a year as input and check If it is a leap year or not.

   B) Plot the curve O(n) and O(n^2).

3. **A)** Write a python program to find the mean and median of a set of elements.

   B) Display electricity consumption of a customer for 12 months using suitable graphical tools.

4. **A)** A store charges Rs.120 per item if you buy less than 10 items. If you buy between10 and 99 items, the cost is Rs.100 per item. If you buy100 or more items, the cost is Rs.70 per item. Write a program that asks the user how many items they are buying and prints the total cost.

   B) Remove all duplicates characters from a given string in Python
   Examples:
   Input :
   abcabcde

Output : abcde

5. **A)** write a python program to find all occurrences of “India” in given string ignoring the case.

B) Write a Python script to print all Prime numbers between 1 to n.

6. **A)**Write a program to convert centigrade to Fahrenheit and reverse also.

B) Write a python program to find the last position of a substring “Emma” in a given string.

7. **A)** Write a program to input 3 sides of a triangle and print whether it is an equilateral, scalene or isosceles triangle.

B) Write a Python function that takes a list and returns a new list with unique elements of the first list.

Sample List : [1,2,3,3,3,4,3,5]
Unique List : [1, 2, 3, 4, 5]

8. **A)** Write a short program to input a digit and print it in words.

B) Write a short program to find the average of some numbers entered through the keyboard.

Output
Enter numbers (Enter 'q' to see the average)
2 5 7 15 12 q
Average = 8.2

9. **A)** Write a python program to take an input list and removes the element at index 4 and add it to the 2nd position and also, at the end of the list.

B) Print the following pattern using Python program

1
2 1
4 2 1
8 4 2 1
16 8 4 2 1
32 16 8 4 2 1
64 32 16 8 4 2 1

10. **A)** Write a Python program to print every integer between 1 and n divisible by m. Also report whether the number that is divisible by m is even or odd.

B) Election results of India for the year 2000 is published. Out of 400 seats, 'ABC’ got

180, ‘XYZ’ got 200 and ‘MNP’ got the rest. Display the result using suitable graphical tools.

11. **A)** Write a python program to find out the palindromic prime numbers between a range.

B) Write programs using nested loops to produce the following patterns:

A
A B
A B C
A B C D
A B C D
E
A B C D E F

12. **A)** Write a python program to find the Twins primes between a range(Twin primes are pairs of prime numbers that have just one number between them: 5 and 7, 11 and 13,and 29 and 31)

B) Write a Python script to find HCF (GCD) and LCM of two numbers.

13. **A)** Write a python program to reduce a string of lowercase characters in range ascii [‘a’..’z’] by doing a series of operations. In each operation, select a pair of adjacent letters that match, and delete them. Delete as many characters as possible using this method and return the resulting string. If the final string is empty, return Empty String.
Input-aabbccdd, output-abd,
Input- abba output-empty string.

B) Write a program to take N (N > 20) as an input from the user. Print numbers from 11 to N. When the number N is a multiple of 3, print "Tipsy", when it is a multiple of 7, print "Topsy". When it is a multiple of both, print "TipsyTopsy

14. **A)** Write a Python program that accepts a hyphen-separated sequence of words as input and prints the words in a hyphen-separated sequence after sorting them alphabetically.
Sample Input : green-red-yellow-black-white
Output : black-green-red-white-yellow

B)Write a Python script to check whether a number is Prime number or not.

15. **A)** Write a Python script to check whether a number is an Armstrong number or not.

B) Write a Python function to check whether a string is a pangram or not. Pangrams are words or sentences containing every letter of the alphabet at least once.
For example : “The quick brown fox jumps over the lazy dog”

16. **A)** Write a Python script to check whether a number is a Perfect number or not.

B) Write a Python function that accepts a string and calculate the number of uppercase letters and lowercase letters. Sample String : ‘The quick Brown Fox’
Expected Output :
No. Of Uppercase characters : 3
No. Of Lower case Characters : 12

17. **A)** Write a Python script to print Fibonacci series up to n terms.

B) Write a python program to convert a decimal number to a number of a given base b.

18. **A)** Write a Python script to find value of following series:
$y = 1 + \frac{1}{2} + \frac{1}{3} + ... + \frac{1}{n}$ where n is user input.

B) Python program to check if a string has at least one letter and one number
Examples:
Input:
welcome2ourcountry34
Output: True
Input:
stringwithoutnum
Output: False

19. **A)** Write a Python Program to print the Prime Factors of an Integer.
B)Write a Python script to find all roots of a quadratic equation $ax^2 + bx + c = 0$ for all possible combinations of a, b and c.

20. **A)** Python program to check if a given string is binary string or not Examples:
Input: str = "01010101010"
Output: Yes

B) Given a list of integers, write a program to find those which are palindromes.

21. **A)** write a program to input a list of numbers and test if a number is equal to the sum of the cubes of its digits. Print that new list and find the smallest and greatest element of that list.

B) Write Python programs to sum the given sequences up to n terms: 2/9 - 5/13 + 8/17…

22. **A)** The set of input is given as ages. Then print the status according to the rules using a python program.

Age	Status
<2	in born
2-10	child
11-17	young
18-49	adult
50-79	old
>80	very old

B) Write a program that takes any two lists L and M of the same size and adds their elements together to form a new list N whose elements are sums of the corresponding elements in L and M. For instance, if L = [3, 1, 4] and M = [1, 5, 9], then N should equal [4,6,13].

23. **A)** Write a Python program to sum the sequence: 1 + 1/1! + 1/2! + 1/3! + + 1/n! (Input n through keyboard)

B) Input two 3X3 Matrices. Now perform
a. the addition of two 3X3 Matrices.
b. perform the elements-wise multiplication of two 3X3 Matrices.
c. perform the Matrix Multiplication of two 3X3 Matrices.

24. **A)** Write a program to accept the age of n employees and count the number of persons in the following age group: (i) 26 - 35 (ii) 36 - 45 (iii) 46 – 55

B) Write programs as per following specifications: "Print the length of the longest string in the list of strings str_list. Precondition : the list will contain at least one element."

25. **A)** Write programs to find the sum of the following series: x - x^2 /2! + x^3 /3! - x^4 /4! + x^5 /5! - x^6 /6! (Input x)

B) Write a program to move all duplicate values in a list to the end of the list.

26. **A)** Write a program to calculate the amount payable after simple and compound interest.

B) Take the five marks of a student for a particular subject. Display the data graphically using suitable graphs.

27. **A)** Say a box of cookies can hold 24 cookies, and a container can hold 75 boxes of cookies. Write a program that prompts the user to enter the total number of cookies, then outputs the number of boxes and the number of containers to ship the cookies. Note that each box must contain the specified number of cookies, and each container must contain the specified number of boxes. If the last box of cookies contains less than the number of specified cookies, you can discard it and output the number of leftover cookies. Similarly, if the last container contains less than the number of specified boxes, you can discard it and output the number of leftover boxes. Take the capacity of the box and container from the keyboard.

B) Read two matrices and add them. Store the matrices and result in a file.

28. **A)** Write a Python script to enter the length and breadth of a rectangle and radius of a circle. Find perimeter and area of rectangle and circumference and area of circle.

B) Read a text file which contain monthly electricity bills of different customers. print the electricity consumption for July and November month.

29. **A)** Write a Python script for the following…

An electric distribution companies arranges its domestic consumer as follows:

Consumption in Units	Rate of charge
0 – 200	Rs. 0.50 per unit
201 – 400	Rs. 100 plus Rs. 0.65 per unit excess to 200
400 – 600	Rs. 250 plus Rs. 0.80 per unit excess to 400
Above 600	Rs. 425 plus Rs. 1.25 per unit excess to 600

Print the amount to be paid by the consumer.

B) Write a python program to create an 3X3 Matrix randomly and calculate sum of the diagonal elements.

30. **A)** Write a Python script to create a Simple Calculator on user choice.

B) i. Write a program to compare two equal sized lists and print the first index where they differ.

Ii. Write a program to reverse a list without using another list or in-built function.

31. **A)** A student's grade is calculated in a subject according to the following rules:

Number Obtained	Grade
>=90 and <=100	O
>=80 and <90	E
>=70 and <80	A
>=60 and <70	B
>=50 and <60	C
>=40 and <50	D
<40 and >=0	F(FAILED)
Others No.	INVALID

Write a Python script which accepts a student's marks as an input and then determine the grade of the students in that subject.

B) Create the following lists using a for loop:

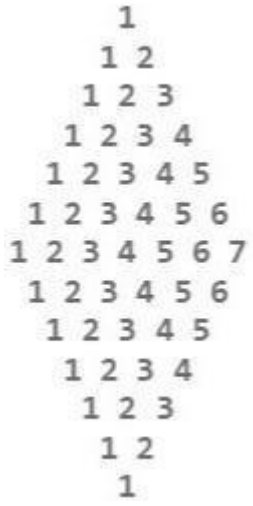
The list ['a','bb','ccc','dddd', . . .] that ends with 26 copies of the letter z.

32. **A)** Write a program to display the maximum and minimum values from the specified range of indexes of list.

B) Write a Python program using a function to check whether a given number is an ugly number. In the number system, ugly numbers are positive numbers whose only prime factors are 2, 3 or 5. First 10 ugly numbers are 1, 2, 3, 4, 5, 6, 8, 9, 10, 12. By convention, 1 is included.

33. A) 1.4 A year is a leap year if it is divisible by 4, except that years divisible by 100 are not leap years unless they are also divisible by 400. Write a program that asks the user for a year and prints out whether it is a leap year or not.

B) Write a program to print the full pyramid of numbers.



34. A) Write a program to input N numbers and then print the largest and second largest number.

B) Generate 30 random 2-d points and draw it using a scatter plot.

35. A) Python program to find union and intersection of two lists.

B) Store 5 students marks for 6 subjects(randomly) and return average marks of each subject and topper student.

36. A) Write a single function to return maximum and minimum value from a list along with the indices.

B) Store 5 students marks for 6 subjects(randomly) then increments 5 marks for each student for each subject then return Final Marks.

37. A) Write a menu driven program to find out the area of circle, square, rectangle and triangle.
B) Generate marks of two students for 6 unit tests randomly then compare the result using suitable graph.

38. A) Generate the average marks(CGPA) of 10 section then plot it using suitable graph.

B) Write a function to implement Bubble sort.

39. A) Python program to accept the strings which contains all vowels

Examples :

Input : ABeeIghiObhkUul

Output : Accepted

B) Delete the second column from a given array and insert the new column in its place.

40. A) A positive integer d is said to be a factor of another positive integer N if when N is divided by d, the remainder obtained is zero. For example, for number 12, there are 6 factors 1, 2, 3, 4, 6, 12. Every positive integer k has at least two factors, 1 and the number k itself. Given two positive integers N and k, write a program to print the kth largest factor of N.

B) Write a program that reads a file line by line. Each line read from the file1 is copied to another file with line number specified at the beginning of the line.

41. A) Create a matrix randomly then sort it with respect to 2nd row.

B) Election results of West Bengal between party X,Y,Z using suitable graph.Take the input total seat and number of seat the party X,Y,Z got.