3EC14: SCRIPTING LANGUAGES
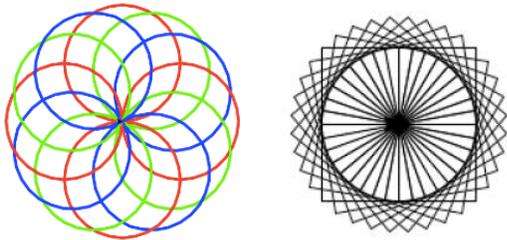## CREDITS – 1 (LTP: 0,0,2)

Course Objective:
To familiarize students with the Linux environment with basic command and to learn the fundamental scripting languages using Perl and Python.

Teaching and Assessment Scheme:

Teaching Scheme (Hours per Week)			Credits	Assessment Scheme				Total Marks
				Theory Marks		Practical Marks		
L	T	P	C	ESE	CE	ESE	CE	
0	0	2	1	00	00	40	60	100

List of Experiments :

Sr. No.	Name of Experiment
1.	**Introduction :** a) To Anaconda and Jypiter notebook b) To NumPy and Pandas
2.	**Operations :** a) Write a program to compute distance between two points taking input from the user (Pythagorean Theorem) b) Write a program add.py that takes 2 numbers as command line arguments and prints its sum.
3.	**Control Flow :** a) Write a Program for checking whether the given number is a even number or not. b) Using a for loop, write a program that prints out the decimal equivalents of 1/2, 1/3, 1/4, . . . ,1/10 c) Write a program using for loop that loops over a sequence. What is sequence? d) Write a program using a while loop that asks the user for a number, and prints a countdown from that number to zero.
4.	**Control Flow – Continued :** a) Find the sum of all the primes below two million. Each new term in the Fibonacci sequence is generated by adding the previous two terms. By starting with 1 and 2, the first 10 terms will be: 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, ... b) By considering the terms in the Fibonacci sequence whose values do not exceed four million, find the sum of the even-valued terms.
5.	**Data Structures :** a) Write a program to count the numbers of characters in the string and store them in a dictionary data structure b) Write a program to use split and join methods in the string and trace a birthday with a dictionary data structure.

Sr. No.	Name of Experiment
	c) Write a program combine lists that combines these lists into a dictionary. d) Write a program to count frequency of characters in a given file. Can you use character frequency to tell whether the given file is a Python program file, C program file or a text file?
6.	**Files :** a) Write a program to print each line of a file in reverse order. b) Write a program to compute the number of characters, words and lines in a file.
7.	**Functions :** (a) Write a function ball_collide that takes two balls as parameters and computes if they are colliding. Your function should return a Boolean representing whether or not the balls are colliding. **Hint** : Represent a ball on a plane as a tuple of (x, y, r), r being the radius If (distance between two balls centers) <= (sum of their radii) then (they are colliding) (b)Write a function to find mean, median, mode for the given set of numbers in a list.
8.	**Functions – Continued :** a) Write a function nearly equal to test whether two strings are nearly equal. Two strings a and b are nearly equal when a can be generated by a single mutation on b. b) Write a function dup to find all duplicates in the list. c) Write a function unique to find all the unique elements of a list.
9.	**Functions - Problem Solving :** a) Write a function cumulative_product to compute cumulative product of a list of numbers. b) Write a function reverse to reverse a list. Without using the reverse function. c) Write function to compute gcd, lcm of two numbers. Each function shouldn't exceed one line.
10.	**Multi-D Lists :** a) Write a program that defines a matrix and prints b) Write a program to perform addition of two square matrices c) Write a program to perform multiplication of two square matrices

11.	**OOP :**
	a) Class variables and instance variable and illustration of the self - variable
	   i. Robot
	   ii. ATM Machine

12.	**GUI , Graphics :** a) Write a GUI for an Expression Calculator using tk. b) Write a program to implement the following figures using turtle

Sr. No.	Name of Experiment
13.	**Search and Sorting :** a) To write a Python Program to perform Linear Search. b) To write a Python Program to perform Binary search. c) To write a Python Program to perform Selection sort. d) To write a Python Program to perform Insertion sort. e) To write a Python Program to perform Merge sort.

List of References:

1. Andrew Mallett, "*Mastering Linux Shell Scripting*", 1st Edition, Packt Publishing, 2015
2. Randal L. Schwartz, Brian D. Foy, Tom Phoenix, "*Learning Perl*",6th Edition,O′Reilly, 2011
3. John Paul Mueller, "*Beginning Programming with Python for Dummies*" Paperback, John Wiley & Sons, October 2014.

Course Outcomes (COs):

At the end of this course students will be able to ….

1. Understand the working environment of LINUX OS including its file system.
2. Identify and Use LINUX utilities for file processing operations with appropriate security.
3. Able to understand the basic concepts scripting using Perl.
4. Develop, Design and Run Python script using different IDE.
5. Interpret the fundamental Python syntax, semantics and be fluent in the use of Python control flow statements.
6. Learn and Implement various scripts using python library including string, list, dictionary and its operations etc.