SATHYABAMA
INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)
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SCHOOL OF COMPUTING

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

(ACCREDITED BY NBA)

SCS4303 – Python Programming and Machine Learning Lab – Syllabus

Python Programming - Basic Concepts Introduction	
Cycle 1	1. a) Handling Input and Output b) Looping constructs c) Arrays, Lists, Sets and Dictionaries
	2. a) Modules and Functions b) File Handling c) Exception Handling
	3. From a given list, find the second highest value from the list. Input: [6, 5, 2, 1, 6, 4] Output: 5
	4. From the string input, count the special characters, alphabets, digits, lowercase and uppercase characters. Input: Sathyabama 2019 @ Output: Digits: 4 Alphabets: 10 Special Characters: 1 Lowercase: 9 Uppercase: 1
	5. For given Input String (s) and Width (w). Wrap the string into a paragraph of width w. Input: s = Sathyabama w = 3 Output: Sat hya bam a
	6. Print of the String "Welcome". Matrix size must be N X M. (N is an odd natural number, and M is 3 times N.). The design should have 'WELCOME' written in the center. The design pattern should only use |, .and - characters.

	7. Consider a function f(X) = X3. Input is 'N' list. Each list contains 'M' elements. From the list, find the maximum element. Compute: S = (f(X1) + f(X2) + f(X3) + … + f(XN)) Modulo Z
	8. Validate the Credit numbers based on the following conditions: Begins with 4,5, or 6 Contain exactly 16 digits Contains only numbers (0 to 9) For every 4 digits a hyphen (-) may be included (not mandatory). No other special character permitted. Must not have 4 or more consecutive same digits.
Python Programming – Data Science	
Cycle 2	1. Read a CSV File. Print column wise output. Input: filename.csv Col1 Col2 Col3 Col4 r1c1 r1c2 r1c3 r1c4 r2c1 r2c2 r2c3 r2c4 r3c1 r3c2 r3c3 r3c4 Output: Col1 r1c1 r2c1 r3c1 Col2 r1c2 r2c2 r3c2 Col3 r1c3 r2c3 r3c3 Col4 r1c4 r2c4 r3c4
	2. Write a python function evenDigits(lower, upper), which will find all such numbers between lower limit and upper limit (both included) such that each digit of the number is an even number.The numbers obtained should be printed in a comma-separated sequence on a single line. Example: evenDigits(2000, 3000) Output: 2, 2, 2, 2 2, 4, 6, 8…
	3. Write a Python program to read last n lines of a file.
	4. Write a Python program to count the frequency of words in a file.
	5. Write a program which accepts a sequence of comma separated 4 digit binary numbers as its input and then check whether they are divisible by 5 or not. The numbers that are divisible by 5 are to be printed in a comma separated sequence (Assume the data is input by console).
	6. A robot moves in a plane starting from the original point (0,0). The robot can move toward UP, DOWN, LEFT and RIGHT with a given step. The trace of robot movement is shown as the following:

	UP 5 DOWN 3 LEFT 3 RIGHT 2 The numbers after the direction are steps. Write a program to compute the distance from current position after a sequence of movement and original point. If the distance is a float, then just print the nearest integer.
	7. Make a Grocery List for super market shopping with name, price and quantity; if the list already contains an item then only update the price and quantity it should not append the item name again. Ask user his/her budget initially and minus the budget after adding a new item in the list. If budgets go zero/0 then no more item could be bought and if some money left and user add item greater than budget left then inform "over price" or any other message. After the list is made any money left in the budget it should show an item within the budget from the list made.
	8. Create a scatter plot using sepal length and petal width to separate the Species classes.
Machine Learning – Algorithms Implementation	
Cycle 3	1. Perform Data Pre-Processing task: Building Good Training Sets.
	2. Manipulate the Twitter Data Set by performing basic NLP tasks.
	3. Word Cloud implementation to identify positive and negative tweets.
	4. Implement the evaluation metrics of machine learning algorithms.
	5. Implement Linear Regression model.
	6. Implement Support Vector Machine algorithm for classification.
	7. Implement k-means clustering algorithm for classification.
	8. Implement Logistic Regression model.
	9. Implement Neural Network model for iris dataset.