**Department of Electrical Engineering**

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| **Faculty Member:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | **Dated: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |
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| **Course/Section:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | **Semester: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |
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**CS-477 Computer Vision**

**Lab#1** **Python Programming-An introduction**

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|  |  | **PLO4-CLO4** | **PLO5-CLO5** | **PLO8-CLO6** | **PLO9-CLO7** |
| **Name** | **Reg. No** | **Investigation**  **(5 marks)** | **Modern Tool Usage**  **(5 marks)** | **Ethics**  **(5 marks)** | **Individual and Team Work**  **(5 marks)** |
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**Lab1: Python Programming-An introduction**

**Objectives:** The following are the main objectives of this lab:

* Create variables of different data types in python
* Use arithmetic and logical operations in python
* Implement conditional statements and loops in python
* Create functions and call them in python
* Implement lists and dictionaries in python
* Read and write to files in python

**Lab Instructions**

* This lab activity comprises of following parts: Lab Exercises, and Post-Lab Viva/Quiz session.
* The lab report shall be uploaded on LMS.
* Only those tasks that completed during the allocated lab time will be credited to the students. Students are however encouraged to practice on their own in spare time for enhancing their skills.

**Lab Report Instructions**

All questions should be answered precisely to get maximum credit. Lab report must ensure following items:

* Lab objectives
* Python codes
* Results (graphs/tables) duly commented and discussed
* Conclusion

## Introduction

This laboratory exercise is meant to introduce the fundamental aspects of the python programming language which will be very important in the later labs of the course.

**Theory**

Python is an interpreted language which is commonly used in many fields including networks, databases, robotics and artificial intelligence etc. It has an easy-to-learn syntax and is ideal for developing prototypes in a short amount of time. Python scripts are written in .py file which is then interpreted and executed by the python interpreter.

A brief summary of the relevant keywords and functions in python is provided below. (For more details, check the slides for this lab)

**print()** output text on console

**input()** get input from user on console

**range()**  create a sequence of numbers

**len()** gives the number of characters in a string or list

**if** contains code that executes depending on a logical condition

**else** connects with **if** and **elif**, executes when conditions are not met

**elif** equivalent to **else if**

**while** loops code as long as a condition is true

**for** loops code through a sequence of items in an iterable object

**break** exit loop immediately

**continue** jump to the next iteration of the loop

**def** used to define a function

**Lab Task 1**

**Write a program that prompts the user for two numbers as input. Then, the program must compare the two numbers and print if they are equal or not. If the numbers are not equal, it must also print which number is greater (or lesser) than the other. The syntax for conditional statements is given below:**

if *condition*:

*statement\_1*

*else:*

*statement\_2*

*### TASK 1 CODE STARTS HERE ###*

*### TASK 1 CODE ENDS HERE ###*

*### TASK 1 SCREENSHOT STARTS HERE ###*

*### TASK 1 SCREENSHOT ENDS HERE ###*

**Lab Task 2**

**Create a list with the sequence 1, 2, 3… 20. Then using the slice operation (:) on this list, print the following sub-lists:**

**5, 6, 7… 20**

**1, 2, 3… 12**

**7, 8, 9 … 16**

**4, 5**

**11, 12, 13, 14**

*### TASK 2 CODE STARTS HERE ###*

*### TASK 2 CODE ENDS HERE ###*

*### TASK 2 SCREENSHOT STARTS HERE ###*

*### TASK 2 SCREENSHOT ENDS HERE ###*

**Lab Task 3**

**Write a function that takes 2 lists as arguments. Both the lists must be of the same length. The function should calculate the product of the corresponding items and place them in a third list. You must NOT use the product operator (\*). You need to provide the function definition and the function call in the code. (Hint: You need to make use of loops in your function.) The function definition syntax is given as follows:**

def *function\_name*:

*statement\_1*

*…*

*return output*

*### TASK 3 CODE STARTS HERE ###*

*### TASK 3 CODE ENDS HERE ###*

*### TASK 3 SCREENSHOT STARTS HERE ###*

*### TASK 3 SCREENSHOT ENDS HERE ###*

**Lab Task 4**

**In this task, you will make use of dictionaries. Write a program that first prompts the user to input five strings which will be the keys of the dictionary. Then, the program must prompt the user to input the values of the respective keys. When entering the values, the user must be shown the key whose value is being input. Once all values are entered, display the dictionary.**

*### TASK 4 CODE STARTS HERE ###*

*### TASK 4 CODE ENDS HERE ###*

*### TASK 4 SCREENSHOT STARTS HERE ###*

*### TASK 4 SCREENSHOT ENDS HERE ###*

**Lab Task 5**

**In this task, you will focus on file handling. Write code that first creates a text file “lab2.txt” with the message “My name is <your\_name>”. Then, your code must open the file in *read* mode and display the contents of the text file. Next, the file must be opened in *append* mode and the message “My registration number is <reg\_number>” must be added to the text file. Finally, the file is read again to display the modified contents.**

*### TASK 5 CODE STARTS HERE ###*

*### TASK 5 CODE ENDS HERE ###*

*### TASK 5 SCREENSHOT STARTS HERE ###*

*### TASK 5 SCREENSHOT ENDS HERE ###*