LABORATORY ASSIGNMENT

on

IT Workshop (Python) (PCC-CS393)

Computer Science & Engineering

3RD Semester

Department of Computer Science & Engineering

Academy of Technology

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Assignment 1:

1.1 Write a program to obtain principal amount, rate of interest and time from user and compute simple interest.

1.2 Write a program to obtain x, y, z from user and calculate expression:

$4x4 + 3y3 + 9z + 6\pi$

1.3 Write a program that reads a number of seconds and prints it in form: mins and seconds, e.g., 200 seconds are printed as 3 mins and 20 seconds. [Hint. use // and % to get minutes and seconds]

1.4 Write a program to take a 3-digit number and then print the reversed number. That is, if the input given is 253, the program should print 352.

1.5 Write a program to compute (a + b)3 using the formula a3 + b3 + 3a2b + 3ab2

1.6 Write a Python script that asks the user to enter a length in centimetres. If the user enters a negative length, the program should tell the user that the entry is invalid. Otherwise, the program should convert the length to inches and print out the result. There are 2.54 centimetres in an inch.

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

1.8 Write a program that reads from user — (i) an hour between 1 to 12 and (ii) number of hours ahead. The program should then print the time after those many hours, e.g.,

Enter hour between 1-12 : 9
How many hours ahead : 4
Time at that time would be : 1 O'clock

1.9 Write a program that asks the user for two numbers and prints Close if the numbers are within .001 of each other and Not close otherwise.

1.10 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.

Note: All the problems required to solve using function(s) only.

Assignment 2:

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

Output:

Enter first side : 10
Enter second side : 5
Enter third side : 10
Isosceles Triangle

2.2 Write a short program to input a digit and print it in words.

Output:

Enter a digit(0-9): 6
Six

2.3 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.

Output:

Enter m: 3
Enter n: 20
3 is divisible by 3
3 is odd
6 is divisible by 3
6 is even
9 is divisible by 3
9 is odd
12 is divisible by 3
12 is even
15 is divisible by 3
15 is odd

2.4Write a short program to find average of list of numbers entered through keyboard.

Output:

```
Enter numbers (Enter 'q' to see the average)
2
5
7
15
12
```

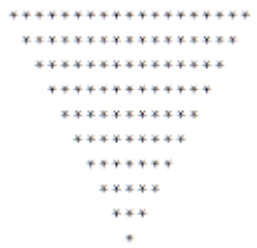
```
q
Average =  8.2
```

2.5 Write a program to input N numbers and then print the largest and second largest number.

2.6 Write a program that takes the input until 'q' and print the palindrome numbers.

2.7 Write a program to find the factorial of a number using a recursive method and without recursion.

2.8 Write a program to print a inverted full pyramid of *



2.9 Write a program to print the full pyramid of numbers.

2.10 Write a program that will check if a number is a magic number or not.
(A magic number is that number whose repeated sum of its digits till we get a single digit is equal to 1. Ex: 1729 1+7+2+9=19 1+9=10 1+0=1)

Assignment 3:

3.1 Given a list of integers, write a program to find those which are palindromes. For example, the number 4321234 is a palindrome as it reads the same from left to right and from right to left.

Output: Enter numbers: (Enter 'q' to stop)
67826 67826 is not a Palindrome Number
4321234 4321234 is a Palindrome Number
256894 256894 is not a Palindrome Number
122221 122221 is a Palindrome Number
q

3.2 Write a Python Program to convert the Binary number to its equivalent Decimal Number using function.

3.3 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

Output Enter the value of n: 10
Enter employee age: 45
Enter employee age: 53
Enter employee age: 28
Enter employee age: 32
Enter employee age: 34
Enter employee age: 49
Enter employee age: 30
Enter employee age: 38
Enter employee age: 33
Enter employee age: 53
Employees in age group 26 - 35: 5
Employees in age group 36 - 45: 2
Employees in age group 46 - 55: 3

3.4 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)

Output Enter the value of x: 2
Sum = 0.8444444444444444

3.5 Write a Python Program to Find the GCD and LCM of Two Numbers.

Assignment 4:

4.1 Python program to check whether the string is Symmetrical or Palindrome
Input: khokho
Output:
The entered string is symmetrical
The entered string is not palindrome

4.2 Python program to print even length words in a string
Input: s = "This is a python language"
Output: This
is
python
language

4.3 Python program to capitalize the first and last character of each word in a string
Input: hello world
Output: HellO WorlD

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

Input: stringwithoutnum
Output: False

4.5 Python program to accept the strings which contains all vowels
Examples :
Input : ABeeIghiObhkUul
Output : Accepted

4.6 Remove all duplicates characters from a given string in Python
Examples:
Input : abcabcde
Output : abcde

4.7 Python program to check if a given string is binary string or not
Examples:
Input: str = "01010101010"
Output: Yes

Assignment 5:

5.1 Write a Python function that takes a list and returns a new list with unique elements of the first list.
Sample List : [1,2,3,3,3,3,4,5]
Unique List : [1, 2, 3, 4, 5]

5.2 Write a python program to show the permutation and combination of an inputted List.

5.3 Python program to find union and intersection of two lists

5.4 Write a Python function that takes two lists and returns True if they have at least one common member.

5.5 Write a Python program to check if each number is prime in a given list of numbers. Return True if all numbers are prime otherwise False.

Assignment 6:

6.1 Write a Python program to find the repeated items of a tuple.

6.2 Write a Python program to reverse a tuple.

6.3 Write a Python program to create set difference.

6.4 Write a Python program to create a symmetric difference of two sets.

6.5 Copy element 44 and 55 from the following tuple into a new tuple tuple1 = (11, 22, 33, 44, 55, 66)

6.6 Modify the first item (22) of a list inside a following tuple to 222 tuple1 = (11, [22, 33], 44, 55)

6.7 Write a Python script to generate and print a dictionary that contains a number (between 1 and n) in the form (x, x*x).

6.8 Sample Dictionary (n = 5) : Expected Output : {1: 1, 2: 4, 3: 9, 4: 16, 5: 25}

Below are the two lists convert it into the dictionary

keys = ['Ten', 'Twenty', 'Thirty']

values = [10, 20, 30]

Assignment 7:

7.1 Write a menu driven program to find out the area of circle, square, rectangle and triangle.

7.2 Write a function to return a list of ten consecutive integers.

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

7.4 Write a function to implement Bubble sort.

7.5 Write a function to implement Binary search.

7.6 Write a function to print the prime numbers that can be expressed as the sum of some other prime numbers. Ex: 5=2+3, 17=2+3+5+7

7.7 Write a program to implement the Tower of Hanoi problem.

7.8 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.

Assignment 8:

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

8.2. Write a python program to perform the addition of two 3X3 Matrices.

8.3. Write a python program to perform the elements-wise multiplication of two 3X3 Matrices.

8.4. Write a python program to perform the Matrix Multiplication of two 3X3 Matrices.

8.5. Write a python program to find row wise maximum and column wise minimum element(s).

8.6. Write a python program to perform addition, subtraction and multiplication of two complex matrices.

Assignment 9:

Solve the following problems using NumPy:

9.1 How to replace items that satisfy a condition with another value in NumPy array?
9.2 How to replace items that satisfy a condition without affecting the original array?
9.3 How to reshape an array?
9.4 How to stack two arrays vertically?
9.5 How to stack two arrays horizontally?
9.6 How to get the common items between two python NumPy arrays?
9.7 How to remove from one array those items that exist in another?
9.8 How to extract all numbers between a given range from a NumPy array?
9.9 How to swap two columns in a 2d NumPy array?
9.10 How to reverse the columns of a 2D array?

Practices:

9.11 How to extract a particular column from 1D array of tuples?
9.12 How to convert a 1d array of tuples to a 2d numpy array?
9.13 How to compute the mean, median, standard deviation of a numpy array?
9.14 How to find the percentile scores of a numpy array?

Assignment 10:

Topic: File Handling

1. Read a text file which contains monthly electricity bills of different customers. Draw the electricity consumption using a suitable graph.
2. Generate the marks of different subjects of different students randomly and store them in a ".csv" file then read it and plot average marks of each subject using bar plot and pie plot.
3. Write a program that counts the number of tabs, spaces and newline characters in a file.
4. 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.
5. Write a program that generates a quiz and uses two files - Questions.txt and Answer.txt. The program opens Questions.txt and reads a question and displays the question with options on the screen. The program then opens the Answer.txt file and displays the correct answers.