Bangladesh-Bharat Digital Service & Employment Training (BDSET)
Lab Evaluation for Python Programming Language
Date: 3rd May 2025

Time: 2 Hours

Question 1: Short Questions
a. What is the difference between = and -in Python?
b. How can you check the data type of a variable in Python?
c. What is the purpose of the "break" and "continue" statements in loops?
d. What is the difference between "is" and =in Python?
e. What does the "len()" function do?

Problem 2:
Make two list with 5 numbers. First list represents the population of the corresponding countries. Second list represents area of the respective countries. Now, prepare a list representing density of the countries. Now find out-
(a) the difference between average number and smallest number.
(b) difference between average and largest number.
Test data:
Population: [120, 330, 936, 88, 51] #List
Area: [30, 11, 12, 4, 17] #List
Density: 4,30,78,22,3 [Density = Population/Area]
(a) Difference between average number and smallest number: (27.4-3) = 24.4
(b) Difference between average number and largest number: (78-27.4) = 50.6

Problem 3:
Write a Python program that will create a dataframe from the given data dictionary below, then print the "attempts" column from created dataframe. After that convert the 'qualified' column values into 0's and 1's, 1 for Yes and 0 for No values.
examinee = {'name': ['Anastasia', 'Dima', 'Katherine', 'James', 'Emily', 'Michael', 'Matthew',
'Laura', 'Kevin', 'Jonas'],
'scores': [12.5, 9, 16.5, 2.3, 9, 20, 14.5, 4.5, 8, 19],
'attempts': [1, 3, 2, 3, 2, 3, 1, 1, 2, 1],
'qualified': ['yes', 'no', 'yes', 'no', 'no', 'yes', 'yes', 'no', 'no', 'yes']}

Problem 4:
A number is called Harshad number (also called Niven number) if the number is divisible by the sum of its digits. For example, 210 is a Harshad number because 210 is divisible by the sum of its digits (2+1+0=3). Write a program

which will print the first 10 Harshad numbers with n-digits. The number n will be known at the time of running your program.

Problem 5:
Write a Python program to print the first 10 numbers in the Fibonacci sequence. Where Fibonacci sequence starts from [0, 1] and next number will be summation of last 2 numbers.

Problem 6:
An Armstrong number is the number which is the sum of the cubes of all its units, tens and hundred digits, etc.
For example, for-a three-digit number 153,
153=1*1*1+5*5*5+3*3*3=1+125+27=153
For a four-digit number 1634,
1634=1*1*1*1+6*6*6*6+3*3*3*3+4*4*4*4=1 +1296+ 81+256 =
1634
Write a Python Program to check if the user entered number is Armstrong number or not.

Problem 7:
Write a Python program that compresses a string such that consecutive identical characters are replaced by the character followed by the number of occurrences.
Example:
Input: "aaabbbccdaa"
Output: "a3b3c2d1a2"

Problem 8:
Write a Python program that reads a list of numbers from a file (numbers.txt), example:
12 15 24
5 15 30
3 12 6

Now find out Greatest Common Divisor (GCD) and Least Common Multiple (LCM) for numbers of each line without using built in methods for GCD and LCM. Finally, make another file for output (Result.txt)