Lab Assignment
Python Programming (DSC2151)
3rd Semester, CSE (DS), HTIK
Session 2025-2026

Day 1

1. Write a program that asks the user for his name and then welcomes him. The output should look like this:

Enter your name: Kumar
Hello Kumar

2. Write a program that asks the user to enter two integers and display their sum and division on the screen.

3. Finding the distance between two points whose coordinates are given.

4. Write a program that prompts the user to input a Celsius temperature and outputs the equivalent temperature in Fahrenheit.
The formula to convert the temperature is: **F = 9/5 C + 32** where F is the Fahrenheit temperature and C is the Celsius temperature.

5. Swap two variables using three different ways.
   i) Swapping using third variable.
   ii) Swaps them without using third variable.
   iii) Swapping using the python specific method (a,b=b,a)
6. Write a program to find the maximum, minimum and average of three numbers.

Day 2

1. Write a program to check whether the given number is an odd or even number.
2. Write a program to add 2 complex numbers.
3. Write a program to find out all the numbers divisible by 13 in a given range of inputs.
4. Write a program to print sum the series 1/1! + 4/2! + 27/3! +.....(do not use function , use iterations only)
5. Find out roots of a quadratic equation.
6. Find out the sum of the numbers provided as command line argument.

Day 3

1. Write a program which will check a number is even or odd? If a

number is even number then check that number is a Palindrome number or not? If it is a odd number then check the number is Armstrong number or not?
Use the following functions:
i) def is_even_odd(n) : To check a number is even or odd.
ii) def is_palindrome(n) : To check a number is palindrome or not.
iii) def is_armstrong(n) : To check a number is Armstrong or not.
Also write the necessary driver codes to use the above functions. Try to use menu driven concept.
2. Calculate GCD of a set of numbers using recursion.
3. Write a program to print Fibonacci series using recursion.

Day 4

1. Using some Editor, create a text file (name: cities.txt) containing names of 10 cities viz. Kolkata, Delhi, Mumbai, Chennai, Bengaluru, Patna, Lucknow, Hyderabad, Gandhinagar and Srinagar, one in each line.Now take source file name and destination file name from the user.Use exception handling to report "FileNotFoundError", if any, for the source file. Copy the source text file to the destination. Report completion status, number of characters copied etc. to the user.

2. Take the name of a file from the user.
Take a string of characters from the user for overwrite / append.
Find out whether the file already exists or not.
If the file already exists, inform the user and display its first and last line to the user with proper format.
Append the given string of characters into the existing file and inform the user accordingly.
If the file does not exist, create the file and inform the user "File created". Then write the string of characters into the created file and inform the user accordingly.

3. Write a program with class Employee that keeps a track of the number of employees in an Organization and stores their name, designation, and salary details.

4. Write a program that has a class Student that stores roll, name, and marks of three subjects of the students. Display the information roll, name, and total marks about the student.

Day 5

1. Write a program with class Employee that keeps a track of the number

of employees in an Organization and stores their name, designation, and salary details.
2. Write a program that has a class Student that stores roll, name, and marks of three subjects of the students. Display the information roll, name, and total marks about the student.
3.Write a python code to do the following
i)Create a class with name Library
ii)Define two class variables to indicate the no. of books in the library, no. of library users.
iii)Define another class variable to indicate the total price of books.
iv)Define the constructor which would initialize the instance of class Library with name of the book, price of the book, name of the user and user id. This would also update the count of the book and the user as the case maybe. The total price of the books in the library will also be updated.
v)define two functions to display the details of the book(name, price) and details of the user.
vi)Now take input from the user and initialize all the instances of the class.
vii)Now use the functions defined by you to display the details of the book and the details of
the user (name only).
viii)Also display the total no. of users, total no. of books and total price of the books.

4. Write a program that has class Person (name, age, gender). Create another class Publication(no_rp, no_book, no_art). Now inherit a class

Faculty(desig,dept) from Person and Publication to print the faculty information.
no_rp : No of research papers published
no_book : No of book chapters published
no_art : No of articles published
desig: Designation
dept: Department
5.Write a python program to do the following
i)Create a class with name student.
ii)Define two class variables college name, total_no_of_students.
iii)Define the constructor which would initialize student id and student name both protected.
iii)Create a class marks which would inherit from student.
iv)Marks would be initialized by marks1 and marks2 variables.
Display student information along with marks in each subject. Print average and grade.

Day 6

1. Write a python program to implement a class Point with x, y as instance

variables. Use of special function (double underscore or magic methods)
__str__ ,__add__ , __sub__ ,__mul__ , __lt__ , __eq__ ,__gt__ ,__le__
2a) Create a list with numbers from 0 to 50.
Use lambda along with filter function to print all numbers divisible with both 3 and 5 from the list.
b) Create a list with numbers from 1 to 20.
Use map function along with lambda function to find the square of each number of the list.
c) Create a list of 5 numbers by taking input from users.
Use reduce function along with lambda to find product of all numbers.

Day 7

1.Write a program to combine two lists into a dictionary. 1st list contains roll no from 1 to 25 and second list reads names from a file.
2. Write a program to count the numbers of characters in the given string and store them in a dictionary data structure.
3. Create a list of size 20 with random numbers from 1 to 9.
a)Write a function unique to find all the unique elements of a list. If an element is found only once in the list, then add that element to the resultant list.
b)Write a function duplicate to find all duplicates in the list. If an element is repeated more than once in the list, then add that repeated element to the resultant dictionary along with its no. of occurrences.
c) Write a function createuniq to create a list of unique elements. Each elements present once in the resultant list.
4. a) Initialize two sets (s1 and s2)
b) Take a few integer numbers from the user (with proper prompt) for set s1 and a few for set s2. Some numbers may be common to both and some may be unique.
c) The program will stop taking the inputs when the number contains at least three numbers of 0's in any place.
d) Now ask the user, which set operation (Union, Intersection, Set Difference) he/she wishes to carry out.
e) Depending on the input, carry out the operation and show the result to the user in appropriate format.

Day 8

1. For a given input string find out if the input pattern is exits in the string or not.
2. User_1 wants to send a message to User_2 and also don't want anyone to read it without his permission. So he shifted every small letter in the sentence by -2 position and every capital letter by -3 position. (If the letter is c, after shifting to by -2 position it changes to a, and for D new letter will be A).
Write a program to prints the encrypted message. You can assume there are no special characters except spaces and numeric value.
3. Write a program that reads a string from the user containing a date in the for mm/dd/yyyy. It should print the date in the form September 5,2023.
4. For the given file, count the total number of lines that contain def or for as whole words.

5. For a given input string :
i) Find all lower case characters alphabetically between "a" and "l".
ii) Find all lower case characters alphabetically excluding ”a" to "l".
iii) Find all digits from the string
iv) Search for a sequence that starts with "he", followed by two (any) characters, and an "o"
v) Search for a sequence that starts with "he", followed by 0 or more (any) characters, and an "o":
6. Write a Python code using Regular Expression to check whether the password given by the user follows a set of rules:
(i) There must be at least 8 characters
(ii) There must be at least 1 small letter

(iii) There must be at least 1 capital letter
(iv) There must be at least 1 numeral
(v) There must be at least 1 special character from the set
!@#$%^&*()-
=+.
Take new password from the user with proper prompt. Display message to the user, depending on whether the password is correct or not. If incorrect, display the type(s) of errors.

Day 9

Q1 Write a Pandas program to create and display a one-dimensional array-like object containing an array of data using Pandas module. Change index for each data point to new one. Like 0,1,2,3 to index

= [‘d’, ‘b’, ‘a’, ‘c’] Update data point with new index

Use different technique to display object.

Q2 Given two series S1 and S2

S1	
A	39
B	41
C	42
D	44
S2	
A	10
B	10
D	10
F	10

Find the output for following python pandas statements. a. S1[: 2]*100
b. S1 * S2
c. S2[: : -1]*10

Q3. From series S1 in Q2 filter with Boolean array (S1>40) and create one new Series object based on Boolean array. Do scalar multiplication, and apply math functions sqrt to new Series object.

Q4. Create a Series from a dictionary as given and display it .
{'a': 100, 'b': 200, 'c': 300, 'd': 400, 'e': 800}

Again create a new Series object from this dictionary with index values ['d','b','e','a'] and display it. Use 'isnull' or 'notnull' functions to check values.

Q5. Write a Pandas program to convert a given Series to an array.

Q6. Write a Pandas program to sort values of a given Series.

Q7. Using Pandas data structure, create a data frame from a dictionary of marks in Physics, Chemistry and Mathematics of four students, as given below:

Name	Physics	Chemistry	Mathematics
Abhishek	88	82	95
Usha	81	91	97
Shreya	90	85	89
Vijay	87	89	91

Add another column showing the marks in Biology as 82, 79, 90, 80 respectively Find the aggregate marks of each student and show it in a new column 'Aggregate' Display in tabular form, the descriptive statistics of all the four subjects and the aggregate

Q8. Create a data frame in Pandas containing 4 rows and 3 columns with some missing values. Use two different methods to fill in the missing values.

Q9. Using Pandas data structure, create a data frame from a dictionary of population (in crores) in the year 2020 and 2019 of three cities in India, as given below:

City	2020	2019
Delhi	3.029	2.94
Kolkata	1.485	1.4755
Mumbai	2.0411	2.0185

Add another column showing the population in the year 2018 as 2.85, 1.468, 1.998 crores respectively. Find the average population of each city in the 3 years and show it in a new column 'Average'

Q10. Sample Python dictionary data and list labels:
data1 = {'name': ['Aheli', 'Diya', 'Karan', 'James', 'Emily', 'Mili', 'Matthew', 'Laura', 'Kriti', 'Jonas'], 'score': [12.5, 9, 16.5, np.nan, 9, 20, 14.5, np.nan, 8,

19],
'attempts': [1, 3, 2, 3, 2, 3, 1, 1, 2, 1],
'qualify': ['yes', 'no', 'yes', 'no', 'no', 'yes', 'yes', 'no', 'no', 'yes']}
labels = ['a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j']

i). Write a Pandas program to get the first 3 rows of a given dataframe.

ii). Write a Pandas program to select the 'name' and 'score' columns from the dataFrame. iii). Write a Pandas program to select the specified columns and rows from a given dataframe.