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**MCA I Semester II (2020 Pattern) Batch -2022-24**

**IT21L – Python Programming Lab**

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| **Sr. No.** | **Assignment topic** | **Date** | **Sign. of Sub. Teacher** | **Remark** |
| ***Assignment-1*** | | | | |
|  | Write a program to compute distance between two points taking input from the user | 10/04/2023 |  |  |
|  | Write a Python program to compute the GCD of two numbers. | 10/04/2023 |  |  |
|  | Find the Square Root of a given number. | 10/04/2023 |  |  |
|  | Write a Python program to demonstrate various base conversion functions. | 10/04/2023 |  |  |
|  | Write a Python program to demonstrate various type conversion functions | 10/04/2023 |  |  |
|  | Write a Python program to find the exponentiation (Power of a number) | 10/04/2023 |  |  |
|  | Write a Program for checking whether the given number is even number or not. | 11/04/2023 |  |  |
|  | Python Program to Check if a Number is Positive, Negative or 0 | 11/04/2023 |  |  |
|  | Python Program to Print all Prime Numbers in an Interval | 11/04/2023 |  |  |
|  | Python Program to Find the Factorial of a Number | 12/04/2023 |  |  |
|  | Write Python programs to print the following Patterns:  A  A B  A B C  A B C D A B C D E | 12/04/2023 |  |  |
|  | Write a program which will find all such numbers which are divisible by 7 but are not a multiple of 5, between 2000 and 3200 (both included). | 12/04/2023 |  |  |
|  | Find the number of digits in the given number(should also works for negative numbers) | 12/04/2023 |  |  |
|  | Reverse the Digits in the given number (should also works for negative numbers) | 13/04/2023 |  |  |
| ***Assignment-2*** | | | | |
|  | Write a code to accept the string of length 10 from the user and print True if string has any character occurring 5 times consecutively in it, otherwise print False | 13/04/2023 |  |  |
|  | Write any 7 functions to perform operations on string. | 13/04/2023 |  |  |
|  | Write any 7 functions to perform operations on list | 13/04/2023 |  |  |
|  | Write any 5 functions to perform operations on Tuple | 13/04/2023 |  |  |
|  | Write any 7 functions to perform operations on Dictionary | 13/04/2023 |  |  |
|  | Python Program to Multiply and sum all items in list | 13/04/2023 |  |  |
|  | Python Program to Find the common members in two lists | 13/04/2023 |  |  |
|  | Write a python code to create two sets. Find out the Union, intersection, difference and symmetric difference between these two sets. | 17/04/2023 |  |  |
|  | Write a Python program to sort (ascending and descending) a dictionary by key and then by value. | 17/04/2023 |  |  |
|  | Write a program to count the numbers of characters in the given string and store them in a dictionary data structure | 17/04/2023 |  |  |
|  | Python program to Test if List contains elements in Range | 17/04/2023 |  |  |
|  | Python Program to print all Possible Combinations of elements in list from the two and three Digits and store both lists in dictionary | 20/04/2023 |  |  |
|  | With a given integral number n, write a program to generate a dictionary that contains (i, i\*i) such that is an integral number between 1 and n (both included) and then the program should print the dictionary. Suppose the following input is supplied to the program: 8 Then, the output should be: {1: 1, 2: 4, 3: 9, 4: 16, 5: 25, 6: 36, 7: 49, 8: 64} | 20/04/2023 |  |  |
|  | You are required to write a program to sort the (name, age, height) tuples by ascending order where name is string, age and height are numbers. The tuples are input by console. The sort criteria is: 1: Sort based on name; 2: Then sort based on age; 3: Then sort by score. The priority is that name > age > score. | 20/04/2023 |  |  |
|  | Write a program to compute the frequency of the words from the input. The output should be stored in dictionary after sorting the key alphanumerically. | 20/04/2023 |  |  |
|  | Write a Python program to find a pair of elements (indices of the two numbers) from a given array whose sum equals a specific target number. Input: numbers= [10,20,10,40,50,60,70], target=50 Output: 3, 4 | 21/04/2023 |  |  |
|  | A Government wants to provide student loans to students in their country. But in order for a student to be eligible to get a loan, he/She must be in the age range 17 to 21, and must have a minimum of 80% score in academics. Write a program to accept a name, age, and marks of student and display if he/she is eligible for the loan or not. | 21/04/2023 |  |  |
|  | Write a function dups to find all duplicates in the list. | 21/04/2023 |  |  |
|  | Write a function unique to find all the unique elements of a list. | 21/04/2023 |  |  |
|  | Write a function reverse to reverse a list. Without using the reverse function. | 24/04/2023 |  |  |
|  | Write a function for linear search and binary search | 24/04/2023 |  |  |
|  | Define a function that can accept two strings as input and print the string with maximum length in console. If two strings have the same length, then the function should print all strings line by line. | 24/04/2023 |  |  |
|  | Write a program that accepts string from a user. The program should print two dictionaries as shown in example.  Example: | 24/04/2023 |  |  |
|  | Write two functions how\_many and biggest which returns the sum of the number of values associated with a dictionary and the key corresponding to the entry with the largest number of values associated with it.  Sample O/P | 24/04/2023 |  |  |
|  | Write a program to check if an element of a list is a prime number. If it is prime, return True or else return False. | 24/04/2023 |  |  |
| ***Assignment-3*** | | | | |
|  | Create class called 'library' with data attributes like Acc-Number, publisher, title and Author, The methods of class should include i) Read()-Acc-Number,title,Author,publisher ii)Compute()-to accept the number of day late, calculate and display the fine fine charged at the rate of Rupees 5/- per day iii)Display the data | 25/4/2023 |  |  |
|  | Write a class called “Investment” with fields called ‘principal’ and ‘interest’. The constructor should set the values of those fields. There should be a method called value\_after that returns the value of the investment after n years. The formula for this is p(1 + i) n , where p is the principal, and i is the interest rate. | 25/4/2023 |  |  |
|  | Write a class called Product. The class should have fields called name, amount, and price, holding the product’s name, the number of items of that product in stock, and the regular price of the product. There should be a method get\_price that receives the number of items to be bought and returns a the cost of buying that many items, where the regular price is charged for orders of less than 10 items, a 10% discount is applied for orders of between 10 and 99 items, and a 20% discount is applied for orders of 100 or more items. There should also be a method called make\_purchase that receives the number of items to be bought and decreases amount by that much | 25/4/2023 |  |  |
|  | Define a class which has at least two methods: getString: to get a string from console input printString: to print the string in upper case. | 27/4/2023 |  |  |
|  | Write a Python class named Circle constructed by a radius and two methods which will compute the area and the perimeter of a circle. | 27/4/2023 |  |  |
|  | Define a class named Shape and its subclass Square. The Square class has an init function which takes a length as argument. Both classes have a area function which can print the area of the shape where Shape's area is 0 by default. | 27/4/2023 |  |  |
|  | Write a Python program to check the validity of a password (input from users). Validation : At least 1 letter between [a-z] and 1 letter between [A-Z]. At least 1 number between [0-9]. At least 1 character from [$#@]. Minimum length 6 characters. Maximum length 16 characters. | 29/4/2023 |  |  |
|  | Write a Python code to validate Email ID. | 29/4/2023 |  |  |
|  | Write a Regular Expression to represent all 10 digit mobile numbers.  Rules:  1. Every number should contains exactly 10 digits.  2. The first digit should be 7 or 8 or 9  Write a Python Program to check whether the given number is valid mobile number or not? | 29/04/2023 |  |  |
|  | Write a Regular Expression to represent all PIBM language (Your own language) identifiers. Rules:  1. The allowed characters are a-z,A-Z,0-9,#.  2. The first character should be a lower case alphabet symbol from a to k.  3. The second character should be a digit divisible by 3.  4. The length of identifier should be at least 2.   Write a python program to check whether the given string is PIBM language identifier or not? | 29/04/2023 |  |  |
|  | Write a program to raise an exception if the user enters name of an employee which is not in predifined list of Employee (note: create a list of employee) | 04/05/2023 |  |  |
|  | Write a program to check the age of person for voting. raise an exception if he is not an eligible person for voting(check for negative values also) | 04/05/2023 |  |  |
|  | Write program for checking length of password. raise an exception if it is not of correct length | 4/05/2023 |  |  |
|  | Write a programm for synchronization of Threads using RLOCK. Accept the two numbers from user and calculate factorial of both Numbers simultaneously | 8/05/2023 |  |  |
|  | Write a multithreading program where one thread prints square of a number and another thread prints factorial of a number. Also display the total time taken for the execution | 8/05/2023 |  |  |
|  | Write a python program to check the given number is prime or not. Handle Suitable Exception | 8/05/2023 |  |  |
|  | Write a function to compute 5/0 and use try/except to catch the exceptions. | 9/05/2023 |  |  |
|  | Develop a program to Print the number of line,words,and characters present in the given file. Accept the file name from user. Handle necessary exceptions | 9/05/2023 |  |  |
|  | Python Program to Append the Contents of One File to Another File | 9/05/2023 |  |  |
|  | Develop a program to remove the comment character from all the lines in a given file. Accept file name from user | 11/05/2023 |  |  |
|  | Write a python program to create an employee.txt file and store employee name and address in the file. | 11/05/2023 |  |  |
|  | Write a python program to read "employee.txt" file and display the alternate employee records. | 12/05/2023 |  |  |
|  | You are given a file called grades.txt, where each line of the file contains a one-word student username and three test scores separated by spaces, like below: GWashington 83 77 54  JAdams 86 69 90 Write code that scans through the file and determines how many students passed all three tests | 12/05/2023 |  |  |
|  | Write a program to print each line of a file in reverse order | 13/05/2023 |  |  |
|  | Write a Python program to combine each line from first file with the corresponding line in second file. | 13/05/2023 |  |  |
| ***Assignment-4*** | | | | |
|  | Write a Python program to perform following operation on MongoDB database i) Create collection "Book" with fields Book-name, Book-code, Book-Author, Book-Price,Book-publication-year ii) Insert 5 documents iii)Find the books whose price between 500-800. iv) Update price of book "Python programming" as 1000 v) Display all books in the order of publication Year |  |  |  |
|  | Write a python program to connect with MongoDB Database. Create collection “restaurants” (Assume suitable structure). Query the “restaurants” collection to a. display all the documents in the collection restaurants b. display the fields restaurant\_id, name, establishment\_year and cuisine for all the documents in the collection restaurant c. find the restaurants who achieved a score more than 90. d. arrange the name of the restaurants in ascending order e. Update restaurant score for the establishment year 2019 |  |  |  |
|  | 19. Write a python program to connect with MongoDB Database. Create collection “movies” (title, writer, year, actors, director...consider this fields in movies collection). Query the “movies” collection to a. Get all documents b. Get all document with director set to “Raj Kapoor” c. get all documents where actors include "Amitabh Bachchan" d. get all movies released in the 90s e. get all movies released before the year 2000 or after 2010 f. Update some documents by adding some extra fields g. Delete movie “movie\_name” |  |  |  |
|  | Write a NumPy program to find the first Sunday in July 2023 |  |  |  |
|  | Write a python program using numpy to do the following operations i) create aaray which contains multiples of 2 till 200 ii)Find the number of occurrences of a sequence in a NumPy array iii)Count the number of elements along a given axis iv) create an identity matrix using v)create a 2\*2 matrix and find the transpose of it vi) create two matrices and find the multiplication of matrices. |  |  |  |
|  | Write a python program to do the following operations on Numpy Array i) Find the k smallest values of a NumPy ii) Compute the nth percentile of the NumPy array iii) Calculate the sum of all columns in a 2D NumPy array iv)Calculate average values of two given NumPy arrays v) Find Mean and Median of a List of Numpy Array |  |  |  |
|  | Write a python program to do the following operations on Numpy Array i )Create a 5X2 integer array from a range between 100 to 200 such that the difference between each element is 10 ii) Return array of odd rows and even columns from below numpy array sampleArray = numpy.array([[3 ,6, 9, 12], [15 ,18, 21, 24],  [27 ,30, 33, 36], [39 ,42, 45, 48], [51 ,54, 57, 60]]) |  |  |  |
|  | Write a Python program to get the number of days of a given month and year |  |  |  |
|  | Write a Python program to convert two date difference in days, hours, minutes, seconds |  |  |  |
|  | Write a Python program to convert a string into datetime |  |  |  |
|  | Write a Python program to do the following operations: Data set: Iris.csv a) Loading data from CSV file b) Compute the basic statistics of given data - shape, no. of columns, mean c) Splitting a data frame on values of categorical variables d) Visualize data using Scatter plot |  |  |  |
|  | Write a python code for handling missing data using fillna(),dropna() method on Iris.csv file[fill the data using mean/median/mode value] |  |  |  |
|  | Write a Pandas program  a. to drop the rows where all elements are missing in a given DataFrame. b. To drop those rows from a given DataFrame in which specific columns have missing values c. to keep the valid entries of a given DataFrame d. to replace NaNs with a single constant value in specified columns in a DataFrame. e. to replace NaNs with median or mean of the specified columns in a given DataFrame. f. to count the number of missing values of a specified column in a given DataFrame. g. to replace the missing values with the most frequent values present in each column of a given DataFrame |  |  |  |
|  | Sample Test Data: |  |  |  |
|  | Use Bollywood.csv file to answer this questions: a) How many records are present in the dataset? Print the metadata information of the dataset. b) How many movies got released in each genre? Which genre had highest number of releases? Sort number of releases in each genre in descending order. c) How many movies in each genre got released in different release times like long weekend , festive season, etc.(Note: Do a cross tabulation between Genre and release Time) d) Which month of the year, maximum, number movie releases are seen?(Note: Extract a new column called month from releaseDate column) e) Which are the top 10 movies with maximum return on investment (ROI)? Calculate Return on investment (ROI) as (BoxOfficeCollection –Budget) / Budget. f) Do the movies have higher ROI if they get released on festive seasons or long weekend? Calculate the average ROI for different release time.  g) Draw a histogram and a distribution plot to find out the distribution of movie budget. Interpret the plot to conclude if the most movies are high or low budgeted movies. h) Which Genre of movies typically sees more youtube likes? Draw boxplots for each genre of movies to compare. |  |  |  |
|  | Use company\_sales\_data.csv file to answer this questions: a. Read Total profit of all months and show it using a line plot b. Get total profit of all months and show line plot with the following Style properties: i. Line Style dotted and Line-color should be red ii. Show legend at the lower right location. iii. X label name = Month Number iv. Y label name = Sold units number v. Add a circle marker. vi. Line marker color as read vii. Line width should be 3 c. Read all product sales data and show it using a multiline plot d. Read toothpaste sales data of each month and show it using a scatter plot e. Read face cream and facewash product sales data and show it using the bar chart f. Calculate total sale data for last year for each product and show it using a Pie chart g. Read Bathing soap & facewash of all months and display it using the Subplot |  |  |  |