Final Assessment Test (FAT)- PMCA602P-Python Programming Lab

Marks Distribution (Total Marks:50)

Components	Marks
Aim and Algorithm (10)	10
Coding & Implementation (20)	20
Output (10)	10
Viva(10)	10
Total	**50**

Instructions:

- ***Write the aim and algorithm in the answer sheet given to you.***
- ***You are requested to write generalized programs. Examples are given only for your understanding. You can use them as sample inputs and outputs.***
- ***Get the outputs verified from your respective faculty and upload the same in the link provided.***
- ***Upload both the question and answer as a single WORD document (Filename must be RegNo_Question no) Ex. (23MCA1001_Q1) with the program (should be pasted as a document only) screenshots of input and output with register number and name embedded in it.***

Q1. Create a list of N Integers. Raise an appropriate built-in exception when a float or string value is entered in the list. Write a Python program using functions to reverse the contents of a queue according to its Size N.

- If N is even, reverse it in a group of N/2 nodes and store the contents in a list.
- If N is odd, keep the middle node as it is, reverse the first N/2 elements and reverse the last N/2 elements, and store it in another list

Create a file in an appropriate mode and store the inputs and outputs in a text file.

Examples:

Input: 1,2,3,4,5,6 (N is even)
Output: 3,2,1,6.5,4
Input: 1,2,3,4,5,6,7 (N is odd)
Output: 3,2,1,4,7, 6,5
Outputs should be displayed for both the even and odd conditions and also stored in a text file.

Q2.Create a tuple containing N integers. Write a Python program using functions to convert it into a list and then extract the first two digits of each number in the list and store it in another list. The input list must contain only integer values. Raise an appropriate built-in exception when a float or string value is entered in the list. Use the output list to create a dictionary that will have all these elements which contain the elements as keys and the value is the sum of the digits of each element. Sort the dictionary based on the key values.

Create a file in an appropriate mode and store the inputs and outputs in a text file.

Example:
Input: 123,155,261,147
Output: 12,15,26,14
Dictionary Values: {12:3,15:6,26:8,14:5}
Sorted Dictionary: {12:3, 14:5,15:6,26:8}

Q3. Write a Python program to create a lists L1 which contains a list of five random integers in unsorted order. Create another list L2 which contains a list of five random integers in sorted order. The task is to find the largest number from the first list and insert this into the second list in the correct position. As each integer is used from the first list, delete it from the first list. Repeat the process until the first list is empty. Use functions to implement the above task. Display the contents of all the lists, L1, L2 at every phase of insertion and deletion. Raise an exception when you find duplicates in the list.

Create a file in an appropriate mode and store the inputs and outputs in a text file.

Example:
L1: 3,5,2,4,6
L2: 1,2,7,9,12
First largest number is 6
Now L2 is: 1->2->**6**->7->9->12 (6 is inserted to L2)
L1:3->5->2->4 (6 is removed from L1)
This is continued till the list L1 is empty and List L2 is shown as below
Now L1: Empty
L2 :1->2->2->3->4->5->6->7->9->12

Q4. RTO wants to validate the Indian driving license number of five license holders. Write a Python program using functions and applying appropriate regular expressions to validate and return the Boolean expression affirming its validity with a reason following the criteria specified below.

- It should be 16 characters long
- The first two characters should be upper-case alphabets that represent the
- state code.
- The next two characters (i.e., RTO code) should be digits with a hyphen placed after the state code (Example: TN-0619850034761) or a whitespace to be included after the digits (Example: TN06 19850034761)
- The next four characters should be digits that represent the license issued
- from the year 1900 to 2030.
- The next seven characters should be any digits from 0-9.

Raise an exception that will be handled when the first two characters are not uppercase alphabets. Create a file and store all the input and output processed into a text file.

Sample Input1:
Input: str = “GJ-2420180”;
Output: False
Sample Input 2:
Input: str = “HR-0619850034761”;
Output: True
Explanation: Valid driving license

Q5. Write a Python Program to create a BankAccount class with attributes accountholder name, account number, and balance. Implement methods deposit(amount) and withdraw(amount) to handle transactions. Create an instance of the class, perform a few transactions, and display the final balance. Throw an exception whenever the balance of an account holder drops beyond Rs.2000. Create a derived class loan account under the base class Bank Account Which will have all the features of the base class and attributes loan amount in the derived class. Use all the access specifiers in the above program.
Create a file that will hold the details of all the account holders and sort the file contents in ascending order of their balances. The file should contain both the input and the output data.