Lab Assignment 1

Date : .....

Explanation

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1.(a) "is_odd_or_even" is a Python function which takes a series of integer "n" as input and reads it from a file named "input1a.txt" and checks if it's odd or even. The input file starts with the number of test cases, followed by each test case's integer value on new line. After processing the data, the output is shown on an output file named "output1a.txt".

1.(b) "calculate" is a Python function that takes series of mathematical expression as input and reads it from an input file named ~~"input1(b)~~ "input1b.txt". The input file starts with the number of test cases, followed by each test case's mathematical expressions, the performs the necessary operations and writes the result of each expression along with the original expression to an output file named "output1b.txt". If division by 0 is encountered it returns "Undefined" as result.

[2] "bubbleSort" is a python function which performs the Bubble Sort algorithm on an array "arr". It reads the array "arr" and its length from an input file "input2.txt". Bubble sort repeatedly compares and swaps adjacent elements if they are not in the ascending order until the entire array is sorted. Then the program writes the sorted array to an output file "output2.txt".

[3] "merge_sort" is a python function which performs Merge Sort on a list of students, where each student is represented as a tuple of (ID, Mark). It reads student data from an input file "input3.txt", mergesorts the students based on their marks in non-decreasing order, and if necessary, sorts by ID in ascending order. The input file starts with the number of students, their IDs and then their marks. Merge Sort devides the list into smaller sublists, sorts them individually and then merges back together in a sorted manner. Finally, it writes the sorted student information to an output file "output3.txt", displaying each student's ID and mark.

[4] This code reads "N" which is the number of schedule of the train, where ($1 \leq N \leq 100$), the N line containing the name of the train and the departure time from an input file "input4.txt". It extracts and sorts information alphabetically by train name and departure time. Finally, it writes the sorted list of train departures back to an output file "output4.txt", preserving the original order of trains if they have the same name and departure time.