Lab - 1
Introduction to Programming (ID110)
Date: October 25, 2024
Topics: Conditional Statements, Loops, 1D-array

Time: 1.5 Hr   CSE'24, Semester - I   Max marks: 10

Instructions:

- The lab session consists of **three programming questions**, and **all are mandatory**.

- External materials (e.g., notes, books) and electronic devices (e.g., mobile phones, smart watch, bluetooth) are **strictly prohibited**. Only a **blank sheet of paper** and a **pen** may be used for rough work.

- Internet usage is **not allowed** under any circumstances. Any violations will lead to **serious academic consequences**, including potential disqualification from the lab.

- Code must be written from scratch during the session. Pre-written code snippets or solutions will not be accepted. Use meaningful variable names and add appropriate comments where necessary.

- Upon completion, **a single folder** named after your **roll number** (e.g., CS24B1001) containing all the **code files** named as `"problem-no.c"` must be submitted on **Google Classroom**. The submission will only be accepted if done in the presence of TA.

- Any form of **plagiarism or academic dishonesty** will be treated with the utmost seriousness and may result in severe penalties, including a zero for the lab or further disciplinary actions.

1. Check whether an integer x is a palindrome number or not. Return **true** if x is a palindrome, and **false** otherwise. A palindrome number is a number that reads the same from left to right and from right to left.

   Input Format: A single integer x (where $-10^9 \le x \le 10^9$).

   Output Format: Print **true** if x is a palindrome, otherwise print **false**.

   Examples:

   - Input: 121
     Output: true

   - Input: -77
     Output: false

   - Input: 25
     Output: false

   (3 marks)

2. Given an array of integers, calculate the mean, median, maximum, and minimum values.

   Input Format: The first line contains a single integer n (where $1 \leq n \leq 10^5$), the size of the array. The second line contains n space-separated integers **in ascending order** representing the array elements. Each integer a_i satisfies $-10^9 \leq a_i \leq 10^9$.

   Output Format: Print the statistics in the following format:
   `Mean: <mean>, Median: <median>, Max: <max>, Min: <min>`

   Examples:

   - Input:
     5
     1 2 3 4 5
     Output: Mean: 3.0, Median: 3.0, Max: 5, Min: 1

   - Input:
     4
     -7 -5 -2 -1
     Output: Mean: -3.75, Median: -3.5, Max: -1, Min: -7

   - Input:
     1
     10
     Output: Mean: 10.0, Median: 10.0, Max: 10, Min: 10

(4 marks)

3. Two best friends, Luffy and Zoro, love to drink soda and each has their own favorite list of soda can flavor. Luffy has an array of integers representing his favorite soda flavor codes, while Zoro has his own array of flavor codes.

   Your task is to help them merge their two arrays into a single array that represents all the unique soda flavors they both enjoy. Remember, the merged array should not contain any duplicate flavor codes.

   Input Format: The first line contains a single integer n (where $1 \leq n \leq 10^5$), the number of Luffy's favorite soda flavors. The second line contains n space-separated integers representing the flavor codes of Luffy's favorite sodas. The third line contains a single integer m (where $1 \leq m \leq 10^5$), the number of Zoro's favorite soda flavors. The fourth line contains m space-separated integers representing the flavor codes of Zoro's favorite sodas.

   Output Format: Print a single line containing the merged list of flavor codes, space-separated.

   Examples:

   - Input:
     3
     1 2 3
     2
     2 4
     Output: 1 2 3 4

   - Input:
     4

5 10 15 20
3
10 20 30
Output: 5 10 15 20 30

- Input:
  2
  100 200
  4
  100 300 400 200
  Output: 100 200 300 400

- Input:
  1
  7
  1
  9
  Output: 7 9

(3 marks)

All the Best!