Lab Exercises

1. Write a C++ program to implement Linear Search. Your program should take an array of integers and a target value as input from the user. The program should search for the target value in the array using the linear search algorithm and output the index at which the target is found. If the target value is not found in the array, the program should display an appropriate message.

2. You've been given an array of numbers representing employee IDs. Your task is to identify the employee whose ID matches the last two digits of your roll number. If your roll number's last two digits are not present in the array, insert the missing value in its correct position within the array. You must use binary search to locate the position of that value within the array.

3. Your team has been given a large dataset (input by user) of sorted, uniformly distributed account balances. If the data is not sorted, you have to sort it first. If the data is not uniformly distributed after you apply sorting (if necessary) you can prompt an error. Your manager has asked you to implement Interpolation Search because it estimates the position of the target value based on the data distribution. This will allow the search to "jump" closer to the target in fewer iterations.