PART-I

1. You are asked to write a simple C++ phonebook application program. Here are the requirements for the application.

    *   User shall add a new contact with name and phone information
    *   User shall load contacts from a file
        *   Each line of the input line includes name and phone information of a contact.
        *   A sample input file is given as an example (phonebook.txt)
        *   User shall load contacts from many files
    *   User shall print the contacts in ascending order
    *   User shall search for a contact with name
    *   User shall list contacts before a particular contact. The resulting list will include all the contacts come before the given contact.
    *   Application is required to structure data using **Binary Search Tree**.

A sample run:

MY PHONEBOOK APPLICATION
Please choose an operation:
A(Add) | L (Load) | S(Search) | P(Print) |F(Filter) |Q(Quit): **A**
Enter name: **MARY SMITH**
Enter phone: **5062396**

A(Add) | L (Load) | S(Search) | P(Print) |F(Filter) |Q(Quit): **A**
Enter file name: **phonebook1.txt**

A(Add) | L (Load) | S(Search) | P(Print) |F(Filter) |Q(Quit): **P**
BARBARA BROWN :4059171
ELIZABETH JONES :2736877   //The content of phonebook1.txt is given below.
JENNIFER MILLER :3863726   PATRICIA JOHNSON 973437
LINDA WILLIAMS :3532665   LINDA WILLIAMS 3532665
MARGARET RODRIGUEZ :350662   BARBARA BROWN 4059171
MARIA ANDERSON :2211086   ELIZABETH JONES 2736877
MARIA DAVIS :6297086   JENNIFER MILLER 3863726
MARIA SMITH :2211086   MARIA DAVIS 6297086
MARY SMITH :5062396   MARIA SMITH 2211086
PATRICIA JOHNSON :973437   MARIA ANDERSON 2211086
SUSAN GARCIA :6063076   SUSAN GARCIA 6063076
11 contacts...   MARGARET RODRIGUEZ 350662

A(Add) | L (Load) | S(Search) | P(Print) |F(Filter) |Q(Quit): **S**
Enter name: **MARY SMITH**
Phone: 5062396

A(Add) | L (Load) | S(Search) | P(Print) |F(Filter) |Q(Quit): **F**
Enter name: **MARIA DAVIS**
BARBARA BROWN :4059171
ELIZABETH JONES :2736877
JENNIFER MILLER :3863726
LINDA WILLIAMS :3532665
MARGARET RODRIGUEZ :350662
MARIA ANDERSON :2211086
6 contacts….

A(Add) | S (Search) | D(Delete) |L(List) |Q(Quit): **Q**
Bye

PART- II
2. In assignment-1, you are asked to implement a similar phone book application, but you were not
    supposed to use Binary Search Tree. Let's compare the performance of search operations in both
    solutions.
    a. Perform a simple search operation with your solution in assignment-1, record the time

    b. Perform a search for the same contact searched in (a) and record the time

    c. Please compare your results.

Hint: you can record the execution time using the following code segment.
```
#include <ctime>

void calculateElapseTime() {
  using namespace std;
  clock_t begin = clock();

  //code_to_time

  clock_t end = clock();
  double elapsed_secs = double(end - begin) / CLOCKS_PER_SEC;
}
```
Part-I Submission:
Please follow the following steps for each assignment:
1. Create a separate repository in GitHub
2. **Clone** the repository to your local computer.
3. Modify the files and **commit** changes to complete your solution in your local repository.
4. **Push**/sync the changes up to GitHub.
5. To turn in the assignment, send the link for the repository as an email to your instructor
    (fatma.serce@..)
Part-II Submission:
Please upload your answer as a text file to canvas for assignment-4.