CSCI3240 Lab 6:

Structures II.

Please check the following link before you start:

- *https://www.tutorialspoint.com/cprogramming/c_structures.htm*
- *https://www.fresh2refresh.com/c-programming/c-passing-struct-to-function/*

1. Modify the provided C program "***lab6Problem1.c***". The program reads the employee details from records.csv and stores it into a structure. This file contains an employee's details including their Name, Zip code, Department, and Salary. You are given a structure named **`Struct_Employee_Info`**, containing the following members:
    a. firstName
    b. lastName
    c. zipCode
    d. department
    e. salary

    The main function in "lab6Problem1.c" reads the loads the data from records.csv file into the structure. Your task is to implement the following functionalities.

    Functionalities:

    a. **`SearchByName`** Function:
    - **Input:** The structure (`employeeStructure`), count of the number of records in the structure (`count`), a first name (`firstName`), and a last name (`lastName`).
    - **Functionality:** Searches within the structure for records matching the full name.
    - **Output:** Returns matching records, which the main function will display.
        - The result should be stored in a string with '\n' character at the end in the following format:

```
Name: [firstName][lastName]\tZip Code: [zipCode]\tDepartment: [department]\tSalary: [salary]\n
```

        - If multiple matching records found, concatenate them together into one string before returning it:

```
Name: [firstName][lastName]\tZip Code: [zipCode]\tDepartment: [department]\tSalary: [salary]\n
Name: [firstName][lastName]\tZip Code: [zipCode]\tDepartment: [department]\tSalary: [salary]\n
Name: [firstName][lastName]\tZip Code: [zipCode]\tDepartment: [department]\tSalary: [salary]\n
```

b. **`SearchByZipCode`** Function:

- **Input:** The structure (`employeeStructure`), count of the number of records in the structure (`count`), and a zip code (`zipCode`).
- **Functionality:** Identifies employees residing within the given zip code.
- **Output:** Returns matching records, which the main function will display.
    - The result should be stored in similar fashion as discussed on "SearchByName" function.

c. **`SearchBySalary`** Function:

- **Input:** The structure (`employeeStructure`) , count of the number of records in the structure (`count`), a salary value (`salary`), and a comparison operator (`comparisonOperator`) from the set {">", "<", ">=", "<=", "=="}.
- **Functionality:** Filters employees based on their salary in relation to the provided operator and value. For instance:
    - Given a salary of `50,000` and `comparisonOperator` as `">="`, the function identifies employees earning `50,000` or more.
    - With a salary of `40,000` and `comparisonOperator` as `"=="`, it fetches employees with that exact salary.
- **Output:** Returns matching records, which the main function will display.
    - The result should be stored in a similar fashion as discussed on "SearchByName"

Constraints:

- $\mathbf{1 \leq len(firstName) \leq 25;}$ $\quad$ $\mathbf{1 \leq len(lastName) \leq 25}$
- $\mathbf{1 \leq len(zipCode) \leq 25;}$ $\quad$ $\mathbf{1 \leq len(department) \leq 25}$
- $\mathbf{1 \leq Salary \leq 10^7;}$ $\quad$ $\mathbf{1 \leq len(Search\ Result) \leq 1000}$
- $\mathbf{1 \leq count \leq 1000}$

Sample contents of **records.csv** file:

```
Pablo,Picasso,37128,Arts,65000
Jack,Sparrow,07801,Movies,40000
Jackie,Chan,12345,Martial Arts,50000
Charles,Babbage,37128,Computer Science,55000
```

Hints:

1. **Returning the result:** You **must** combine the matching records as a string and then finally return the string to the caller function. Check the following functions:
   a. https://www.tutorialspoint.com/c_standard_library/c_function_sprintf.htm
   b. https://www.tutorialspoint.com/c_standard_library/c_function_strcat.htm

Sample Run/Output Format:

```
(base) jovyan@jupyter-asainju:~/3240/lab6$ gcc lab6Problem1.c -o lab6Problem1
(base) jovyan@jupyter-asainju:~/3240/lab6$ ./lab6Problem1

Search Results by Name: Jack Sparrow
Name: Jack Sparrow      Zip Code: 07801 Department: Movies      Salary: 40000

Search Results by Zip Code: 37128
Name: Pablo Picasso     Zip Code: 37128 Department: Arts        Salary: 65000
Name: Charles Babbage   Zip Code: 37128 Department: Computer Science    Salary: 55000

Search Results by Salary: >= 45000
Name: Pablo Picasso     Zip Code: 37128 Department: Arts        Salary: 65000
Name: Jackie Chan       Zip Code: 12345 Department: Martial Arts        Salary: 50000
Name: Charles Babbage   Zip Code: 37128 Department: Computer Science    Salary: 55000

Search Results by Salary: == 500000
No matching records found.
(base) jovyan@jupyter-asainju:~/3240/lab6$
```

Steps to Create the Log File:

1. **Open your terminal and start the scripting process by typing:**

```
(base) jovyan@jupyter-asainju:~/3240/lab6$ script Lab6_Log.txt
```

2. **List all the files in the current directory:**

```
(base) jovyan@jupyter-asainju:~/3240/lab6$ ls
```

3. **Compile your problem 1:**

```
(base) jovyan@jupyter-asainju:~/3240/lab6$ gcc lab6Problem1.c -o lab6Problem1
```

4. **Run your problem1:**

```
(base) jovyan@jupyter-asainju:~/3240/lab6$ ./lab6Problem1
```

Note: You can test with multiple other input values here.

5. **Exit the scripting process to finish and save the log file:**

```
(base) jovyan@jupyter-asainju:~/3240/lab6$ exit
```

6. **Convert the log file from txt to pdf using the txt created from using script**

```
(base) jovyan@jupyter-asainju:~/3240/lab6$ wkhtmltopdf Lab6_Log.txt Lab6_Log.pdf
```

The '**Lab6_Log.pdf** ' file will be generated in your current directory. Make sure this file is included in your submission.

Submission Instructions:

Please upload the following files:

- lab6Problem1.c
- Lab6_Log.pdf
- AI_Disclaimer.pdf

- **Submission Due:** Check Lab 6 Dropbox

Rubrics (Total 100 points):

Criteria	Points
Incorrect output format: filed label missing	-10
Incorrect output format: in case of no record does the program does not print "No matching records found." message.	-10
Incorrect output format: Miscellaneous printing issues	-10
The program does not satisfy the constraints	-15
SearchByName function does not work	-20
SearchByZipCode function does not work	-20
SearchBySalary function does not work	-20
The source code is not named correctly (it should be lab6Problem1.c)	-10
No submission or source code is missing	-100