CSV File Reading and Struct Handling in C

Objective: The goal of this assignment is to practice reading data from a CSV file and storing it in a C struct. Students will implement functions to parse the CSV file, create and manage a struct to store the data, and perform basic operations on the data.

Task 1: Define the Struct Create a C struct named `Student` to represent student information. The struct should have the following fields:

- `int id`: Student ID
- `char name[50]`: Student name
- `int marks[10]`: Array to store the marks for this class. The value stored in marks[0] should be the midterm mark, and the assignment marks can be stored in the other array positions.

Task 2: Read Data from CSV File Write a function `readCSV(const char* filename, struct Student* students, int* numStudents)` that reads data from a CSV file and stores it in an array of `Student` structs. The CSV file will have the following format:

```
id, name,       midterm, A1, A2, A3, A4, A5, A6, A7, A8
1,  John Doe,   90,       0,  9,  7, 10, -1, -1, -1, -1
2,  Jane Smith, 88,       9,  9, -1, 10, -1, -1, -1, -1
```

The function should populate the `students` array and update `numStudents` with the total number of students read from the file. Note that a -1 means that the student has not completed the task, and this value should not be included in averages. A "0" indicated that the student did the work and received a 0. You should use strtok() to tokenized the data from the file.

Task 3: Display Student Information Write a function `displayStudent(struct Student* student)` that takes a `Student` struct as a parameter and prints its information (ID, name, and marks in the class) to the console. The marks should be properly labelled.

Task 4: Calculate Class Mark Write a function `float calculateClassMark(struct Student* students, int numStudents)` that calculates and returns the mark the student currently has in the class (as per the weighted class marking scheme) out of the total possible marks in the class.

Task 5: Calculate Midterm/Assignment Mark Write a function `float calculateAverageMark(struct Student* students, int numStudents, int classIndex)` that calculates and returns the average mark for the specified midterm/assignment (as specified by `classIndex`) across all students.

Task 6: Search for a Student Write a function `struct Student* searchStudent(struct Student* students, int numStudents, int targetID)` that searches for a student with a given ID in the array. Return a pointer to the matching `Student` struct if found, or `NULL` if not found.

Task 7: Application Write a program that uses the functions you implemented to:

- Read student data from a provided CSV file.
- Display the information of all students.
- Calculate and display the class marks for students (based on the marking scheme).
- Calculate and display the average marks for a specific assignment (let the user input the assignment index).
- Prompt the user to enter a student ID and display the information of the corresponding student if found.

Submission Guidelines:

- Submit the C source code files.
- Include comments to explain your code.
- Provide a sample CSV file for testing.
- Include a code diary of the work you did implementing this assignment.

Additional Notes:

- Assume that the CSV file is well-formed, and there are no missing or incorrect values.
- Test your program with different CSV files to ensure robustness.