

## Assignment 4 – Processing CSV Data with Threads

### Description:

This assignment involves processing CSV (Comma-Separated Values) data using multi-threading techniques in C programming language. The main tasks include reading CSV files, parsing the data into fields, performing operations on the data, and managing memory efficiently.

### Approach:

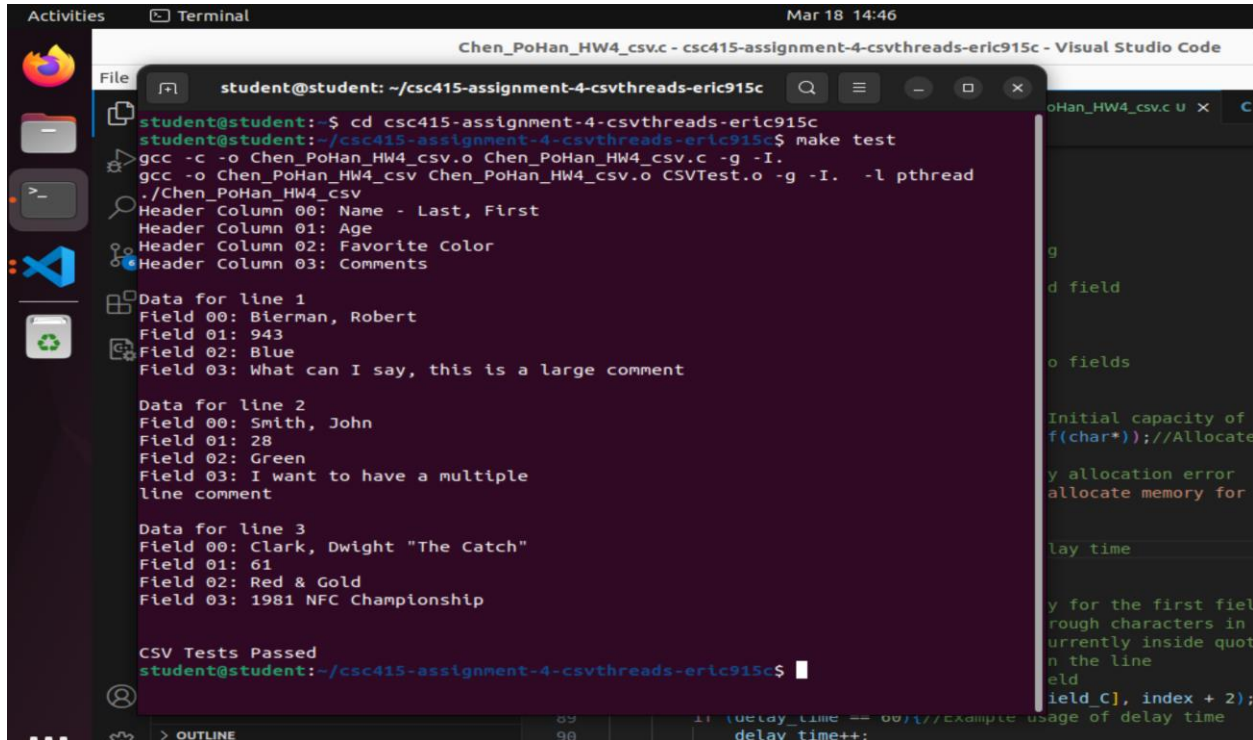
1. Begin by setting up functions to handle file operations such as opening, reading, and closing CSV files. Ensure error handling mechanisms are in place for cases where files cannot be opened or read.
2. Implement a function to parse each line of the CSV file into individual fields. This involves handling commas as field separators, quotes for enclosing fields with special characters, and newline characters. Use dynamic memory allocation to accommodate variable field lengths.
3. It is necessary to develop functions to process individual fields, which may include trimming whitespace, handling quoted fields, and performing any required data transformations.
4. Implement functions to allocate and deallocate memory for storing CSV data and parsed fields. Ensure proper error handling to avoid memory leaks.

### Issues and Resolutions:

My first issue was I can't do the second and third parts

**Analysis:** (If required for the assignment)

**Screen shot of compilation:**



```
student@student:~/csc415-assignment-4-csvthreads-eric915c$ cd csc415-assignment-4-csvthreads-eric915c
student@student:~/csc415-assignment-4-csvthreads-eric915c$ make test
gcc -c -o Chen_PoHan_HW4_csv.o Chen_PoHan_HW4_csv.c -g -I.
gcc -o Chen_PoHan_HW4_csv Chen_PoHan_HW4_csv.o CSVTest.o -g -I. -l pthread
./Chen_PoHan_HW4_csv
Header Column 00: Name - Last, First
Header Column 01: Age
Header Column 02: Favorite Color
Header Column 03: Comments

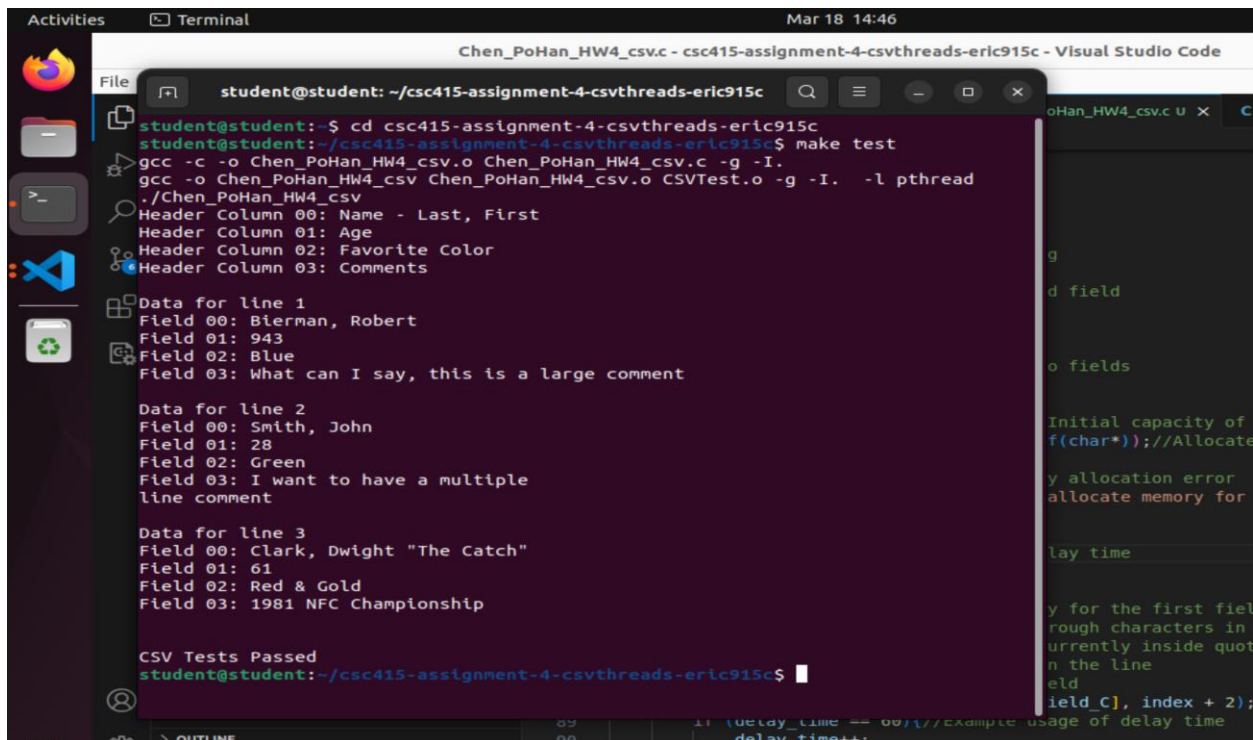
Data for line 1
Field 00: Bierman, Robert
Field 01: 943
Field 02: Blue
Field 03: What can I say, this is a large comment

Data for line 2
Field 00: Smith, John
Field 01: 28
Field 02: Green
Field 03: I want to have a multiple
line comment

Data for line 3
Field 00: Clark, Dwight "The Catch"
Field 01: 61
Field 02: Red & Gold
Field 03: 1981 NFC Championship

CSV Tests Passed
student@student:~/csc415-assignment-4-csvthreads-eric915c$
```

Screen shot(s) of the execution of the program:



```
student@student:~/csc415-assignment-4-csvthreads-eric915c$ cd csc415-assignment-4-csvthreads-eric915c
student@student:~/csc415-assignment-4-csvthreads-eric915c$ make test
gcc -c -o Chen_PoHan_HW4_csv.o Chen_PoHan_HW4_csv.c -g -I.
gcc -o Chen_PoHan_HW4_csv Chen_PoHan_HW4_csv.o CSVTest.o -g -I. -l pthread
./Chen_PoHan_HW4_csv
Header Column 00: Name - Last, First
Header Column 01: Age
Header Column 02: Favorite Color
Header Column 03: Comments

Data for line 1
Field 00: Bierman, Robert
Field 01: 943
Field 02: Blue
Field 03: What can I say, this is a large comment

Data for line 2
Field 00: Smith, John
Field 01: 28
Field 02: Green
Field 03: I want to have a multiple
line comment

Data for line 3
Field 00: Clark, Dwight "The Catch"
Field 01: 61
Field 02: Red & Gold
Field 03: 1981 NFC Championship

CSV Tests Passed
student@student:~/csc415-assignment-4-csvthreads-eric915c$
```