Lab 1 Writeup

Team:
Evin Killian, Tyler Campanile

Design Decisions:
We decided on using Python to implement the project due to its ease at implementing and testing new features.

We used GitHub to store, retrieve, and make changes to the project code so we could work on separate computers at different locations while ensuring our different tasks were merged into one file.

We chose to create a Student class consisting of all the variables each Student has from the CSV file. We used a List as the data structure to store these Students as it allowed us to quickly implement each required feature and because we did not sort the Students, so we had to implement a linear search.
For a large enough Student list, this could cause our search functions to take a noticeably long time to complete. Because of this, a List is not the best data structure for the project.

Task log:

Task Name	Started by	Start Time	End Time	Total Hours
File Parsing	Evin	4/3 10:00	4/3 10:20	.33 hours
Find Student, R4	Tyler	4/3 10:00	4/3 11:00	1 hour
Command Line	Evin	4/3 10:00	4/3 10:30	.5 hours
Find Student, R5	Tyler	4/5 10:00	4/5 10:30	.5 hours
Search Grade	Evin	4/6 8:30	4/6 8:45	.25 hours
Test Cases	Evin	4/8 10:40	4/8 11:00	.33 hours
Average GPA	Tyler	4/8 10:00	4/8 10:20	.33 hours

Testing:
For testing, we each tested each feature as we implemented it. Since we split who implemented what feature, the implementer was responsible for testing that feature. Some bugs we found were divide by zero errors, such as in calculating the average GPA, and print errors such as not casting ints or floats to strings before printing. Since the errors we encountered were not elusive, it didn't take more than a minute to properly isolate and correct them.

Final Thoughts:

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Based on the size of the provided student file and the fact that it was the only file we were required to use for this assignment, our implementation of this project works great. With this in mind, it is not necessarily very scalable, as the entire file needs to be loaded into memory and stored as Student objects before any searching can be done. In addition, the file needs to be sorted perfectly for all of the Student objects to line up correctly. With this in mind, we would most likely change the design of this project if we were required to greatly expand on it.

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Test Suite for Lab 1, Part 1

```
// TC-1
// Tests Requirements R3, R4
// Short form command name, existing student
// Expected output: "   SARAO, DIEDRA, 2, 108, HAMER, GAVIN"

S SARAO

// TC-2
// Tests Requirements R3, R4
// Short form command name, non-existing student
// Expected output: None

S FALANTHROPO

// TC-3
// Tests Requirements R3, R5
// Short form command name, existing student with bus route
// Expected output: "   SARAO, DIEDRA, 52"

S SARAO B

// TC-4
// Tests Requirements R3, R5
// Short form command name, non-existing student with bus route
// Expected output: None

S MARFAH B

// TC-5
// Tests Requirements R3, R6
// Short form command name, existing TEACHER
// Expected output: "Students belonging to teacher:
```

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```
                        COOKUS,XUAN
                        ELHADDAD,SHANTE
                        SWEDLUND,SHARRI
                        CIGANEK,MANIE
                        COVINGTON,TOMAS
                        EARLY,TORY
                        LINHART,LELA"

T FAFARD

// TC-6
// Tests Requirements R3, R6
// Short form command name, non-existing teacher
// Expected output: "Students belonging to teacher:"

T AYERON

// TC-7
// Tests Requirements R3, R7
// Short form command name, grade number
// Expected output: "Students in grade level 1
                        SAELEE,DANILO
                        GARTH,JOHN"

G 1

// TC-8
// Tests Requirements R3, R9
// Short form command name, grade number with low option
// Expected output: "Student with lowest gpa in grade level 1
                        SAELEE,DANILO,2.85,FALKER,ADOLPH,54"

G 1 L

// TC-9
// Tests Requirements R3, R9
// Short form command name, grade number with high option
// Expected output: "Student with highest gpa in grade level 1
                         GARTH,JOHN,3.14,FALKER,ADOLPH,0"

G 1 H

// TC-10
// Tests Requirements R3, R8
// Short form command name, bus route
// Expected output: "Students who take bus 0
                        SCHOENECKER,PHUONG,6,109
                        FINCHMAN,MATHILDA,6,111
```

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```
                        BRODERSEN,HYE,3,110
                        HAVIR,BOBBIE,2,108
                        MASSART,ELDON,4,105
                        GARTH,JOHN,1,103
                        CREMEANS,RANDOLPH,6,109
                        KREESE,CARRIE,6,109"

B 0

// TC-11
// Tests Requirements R3, R10
// Short form command name, average GPA
// Expected output: "   grade level: 1
                        gpa average: 2.995"

A 1

// TC-12
// Tests Requirements R3, R11
// Short form command name, grade info
// Expected output: "   Grade 0: 0 Students
                        Grade 1: 2 Students
                        Grade 2: 13 Students
                        Grade 3: 9 Students
                        Grade 4: 15 Students
                        Grade 5: 0 Students
                        Grade 6: 21 Students"

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// TC-13
// Tests Requirements E1
// Invalid command
// Expected output: "Invalid or incomplete command"

HELP

// TC-14
// Tests Requirements R3, R12
// Short form command name, quit
// Expected output: Program Terminates

Q
```