

CS 215 – Spring 2021
Lab 5

Learning Objectives:

- reading data from an input file
- use of structures and arrays to aggregate data
- use of functions including arrays as arguments

General Description:

Write a program that reads data from a file on students and their project scores.

A *student* consists of the following fields:

- first name (no spaces)
- last name (no spaces)
- average (may have digits past the decimal point)
- a Partial Array of scores (ints), max 5
- the number of scores

Input file format:

- the first line: contains the number of students followed by the number of scores for each student
- each additional line contains, for each student:
 - o first name, last name, a list of scores

Sample input file for 5 students each with 4 scores:

```
5 4
Sally Smith 88 77 99 66
Adam Ant 85 75 95 65
Betty Boop 96 94 92 90
Freddy Krueger 66 77 55 44
Pepe LePew 87 77 67 57
```

Write the following functions:

read() - modifies: a partial array of students

Opens a file called “students.txt” which has the format described above. Note there may be more or less than 5 students, and more or less than 4 scores per student. When the file fails to open, prints “Unable to open input file”, sets the number of scores in the partial array to 0, and exits. Otherwise, the function continues.

For each student,

- reads the first and last names (no spaces) into the partial array of students.
- for each score, reads the scores into the partial array of scores for the student.

When reading is complete, the file is closed.

calcAverages(): given a Partial Array of Students

For each student, adds up the scores and divides by the number of scores to set the average.

print(): given a Partial Array of Students

Prints a header as shown in the example. Prints the data for each student on one line, with the following field widths:

- first name 15
- last name 15
- average 6
- scores 3

First	Last	Avg	S1	S2	S3	S4	S5
Sally	Smith	82.50	88	77	99	66	
Adam	Ant	80.00	85	75	95	65	
Betty	Boop	93.00	96	94	92	90	
Freddy	Krueger	60.50	66	77	55	44	
Pepe	LePew	72.00	87	77	67	57	

search(): given a Partial Array of Students, a search First Name and a search Last Name.

Searches the partial array for a student with a first and last name that matches the given search names. When found, returns the index in the array where found. When not found, returns -1.

main(): The main() is given on the course web site. Use this to test your functions.

Sample Execution:

```
First      Last      Avg      S1  S2  S3  S4  S5
-----
Sally      Smith      82.50    88  77  99  66
Adam       Ant        80.00    85  75  95  65
Betty      Boop       93.00    96  94  92  90
Freddy     Krueger    60.50    66  77  55  44
Pepe       LePew      72.00    87  77  67  57
Enter First and Last to search (or 0 0): Adam Ant
Average is 80.00
Enter First and Last to search (or 0 0): Pepe LePew
Average is 72.00
Enter First and Last to search (or 0 0): Bugs Bunny
Not found
Enter First and Last to search (or 0 0): 0 0
```