# CS 255 Computer Science II Spring, 2022

1. **Assignment #2**
2. **Value: 20 points**

**Are You Ready for Some Football?**

Fran came up with a new formula that rates the performance of a quarterback for a football game. Your job is to test her formula by writing a program to process quarterback data from a given input file. Assume the file is named **football-in.txt**. The file will contain data for an arbitrary number of quarterbacks. A quarterback's first and last names will appear on lines by themselves. His game data (attempts, completions, yards passing, touchdowns, and interceptions) will appear on the line below his last name. All numeric data will be integers. Assume there will not be more than 500 quarterbacks. A sample input file is shown on the reverse side of this sheet.

Your program should compute the completion percentage and the quarterback rating and display it with the input data.

Your program **MUST** include the following ***functions***:

1. Read the data from the input file into an array of structs.
2. Compute and return the completion percentage (completions divided by attempts) given a quarterback struct (return zero if attempts is zero).
3. Compute and return the quarterback rating given a quarterback struct (return zero if attempts is zero). Use the following formula for the quarterback rating:

A picture containing text

Description automatically generated

1. Display the data from the array of structs, along with the completion percentage and the quarterback rating. This function should call the two functions above (#2 and #3). The output should be displayed using formatted spacing and precision as shown on the next page. Use the setw command for alignment. Do not use tabs. See sample on reverse side of this sheet for a guide.
2. Sort by quarterback's last name in ascending order
3. Sort by quarterback rating in descending order

Write a main driver function that will test and verify that all of your functions are working correctly.

**SAMPLE INPUT**:

Dan

Marino

22 14 219 2 2

Terry

Bradshaw

33 21 302 1 0

Roger

Staubach

24 12 244 0 1

**CORRESPONDING OUTPUT** (the X's, of course, should be replaced with actual data):

Quarterback Att. Comp. Pct. Yards TD Int. Rating

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Dan Marino XX XX XX.X XXX XX X XX.XX

Terry Bradshaw XX XX XXX.X XXX X X XXX.XX

Roger Staubach XX X XX.X XX X X XX.XX

**FOR FULL CREDIT**: Follow directions carefully and submit the source code and a sample input file with at least data from 8 quarterbacks to Canvas by the deadline. You must zip these 2 files together before submitting.

***Readability and Programming Practices:*** Commenting, appropriate spacing, naming, and indentation will be very important for this project. **Constants must be used where appropriate.**

Please see suggestions below.

* The comments at the top of your source code file should include:
  + Your Name
  + CS 255 – Computer Science II
  + Assignment Number
  + Brief Description of the Project
  + Due Date each on separate lines.
* In the comments at the top of each function, be sure to include:
  + Function Name
  + Brief Description of the Function
  + Incoming – what data is coming into the function?
  + Outgoing – what data is going out of the function?
  + Return – what information/type is the function returning?
* Commenting your code should be thorough and concise:
  + Be careful not to include too many or too few comments
  + Be sure to comment variable names whose intent is not clear
  + Be sure to comment major sections of your program
* Be sure to make your code readable:
  + Good identifier names
  + Good use of white space
  + Indentation
  + Clear breaks between major components (with the use of whitespace and/or lines of comments)