**Lab 03**

**Passer Rating Calculation**

**Problem Statement**

In American NFL football, there is a statistic for passers called the passer rating. This is used as a measurement of performance. Passer rating is on a scale from 0 to 158.3. The calculation requires five inputs: pass completions, pass attempts, yards gained, touchdowns, and interceptions. The formula for determining the rating is:

rating = ((C + Y + T + I) / 6) \* 100

where

* C is the scaled completions per attempt, which is completions per attempt multiplied by 100, minus 30, all divided by 20
* Y is the scaled yards per attempt, which is yards per attempt minus 3, all divided by 4
* T is the scaled touchdowns per attempt, which is touchdowns per attempt multiplied by 20
* I is the scaled interceptions per attempt, which is 2.375 minus the 25 times the quantity interceptions per attempt

Some example ratings from the 2015 NFL regular season are:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Player** | **Completions** | **Attempts** | **Yards** | **Touchdowns** | **Interceptions** | **Rating** |
| Russell Wilson Seahawks | 329 | 483 | 4024 | 34 | 8 | 110.1 |
| Andy Dalton Bengals | 255 | 386 | 3250 | 25 | 7 | 106.2 |
| Carson Palmer Cardinals | 342 | 537 | 4671 | 35 | 11 | 104.6 |
| Cam Newton Panthers | 296 | 495 | 3837 | 35 | 10 | 99.4 |

Note: the actual formula is just slightly more complicated than the one I am presenting here. It sometimes makes a slight adjustment for players at the extreme high and low ends of the scale. But for most players, this formula is correct, and it works for all of the players shown in the table above.

**Assignment**

Your assignment is to design and create a program that prompts the user for, and reads in, the five required inputs for a player, and then calculates and displays the player’s rating. A run of the program should look exactly like this:

Enter the number of completions: 329

Enter the number of attempts: 483

Enter the number of yards: 4024

Enter the number of touchdowns: 34

Enter the number of interceptions: 8

The player's rating is: 110.123

Because we have not yet learned the rules for mixing data types, all of your values should be floating point types, even though many of them really should be unsigned values (because they are counts).

These formulas have many magic numbers in them. For this program, magic numbers are ok, because we do not have any way to create meaningful names for values such as “divided by 4” or “2.375 minus”. With that exception noted, read over the style guide and make sure your program conforms to it in other ways. In particular, pay attention to the following:

* the maximum line length is 78, so you will have to break long lines at operators as shown in the style guide
* indent levels consist of two spaces
* matching curly braces are aligned vertically
* variable names are all lower case, with underscores where needed for readability, and they should be meaningful names
* all binary operators have space on either side
* always terminate output with an endl

You should not create any named constants in the program.