

In this programming assignment, you are defining and implementing a class to hold a single baseball player's data/stats. This **Player** class will be used in two or three follow on assignments.

You are to develop a program to define and test an object class whose instances will be used to store some batting data for a baseball player. We use this information to compute some statistics about our baseball players. Each baseball player will have the following data:

firstname lastname plateappearances atbats singles doubles triples homeruns walks hitbypitch

The 8 statistics are integers and must be stored in a single array within a Player object.

Your class needs to provide all the methods needed to:

- provide a default constructor for your Player class
 - default first and last name are "unknown"
 - default integer values are 0
- read a player's data from a single line of input from an input stream:
 - You will pass a parameter that is a referenced to an istream. This function will assume the next line of input on that stream is valid or is blank. If blank line, your program should ignore it.
 - The reader method MUST NOT print messages to or prompt the user for data. It is a non-interactive utility only.
- Get methods for any data the test driver program might need to write to an output stream, such as the screen or an output file.
- Compute the Player's Batting Average and OPS values. (see below for formulas)
- Any other methods you need to solve the problem.

SUMMARY OF OPERATION

- Prompt the user for the input and output file names. DO NOT hardcode file names into your program.
- Open input file and output file.
- Read each player line, ensure the data is saved in a player object, and have the object perform its computations
- Keep track of the number of players your program reads in!
- Write each item from the list into the output file, along with any other output required by the assignment
- Write a report summary line to the output file

COMPUTING STATS:

Batting Average:

The batting average is the sum of the hits (singles, doubles, triples, home runs) divided by the number of at-bats.

On Base Percentage:

We are also going to compute on base percentage. OBP is the sum of all hits, walks and hit by pitch divided by the number of plate appearances. Please note, if you are using the official baseball references, this computation is slightly off because there are a few more stats actually used in the official statistic.

Slugging Percentage:

The slugging percentage is a weighted average. It is computed by:

$$\text{slugging} = \frac{\text{singles} + 2 * \text{doubles} + 3 * \text{triples} + 4 * \text{homeruns}}{\text{number of at bats}}$$

OPS, On-Base plus Slugging:

OPS is a baseball statistic composed of the sum of a player's on-base percentage and slugging percentage. This is a measure of two very important offensive skills: the ability to get on base and to hit for power.

SAMPLE EXECUTION

Below is a screen capture of what the program would look like when I tested it with the sample input file given below. Please note, I will test it with other sets of data. You may assume that the file input does not contain erroneous data.

```
Welcome to the player statistics calculator test program.

Enter the name of your input file:  playerinput.txt
Enter the name of your output file: report.txt

Reading the data from: playerinput.txt
The output is in: report.txt

End of Program.
```

A SAMPLE INPUT FILE

Hank Aaron	13941	12364	2294	624	98	755	1402	32
Chipper Jones	10614	8984	1671	549	38	468	1512	18
Ty Cobb	13099	11434	3053	724	295	117	1249	94
Jonny Bench	8674	7658	1254	381	24	389	891	19
Tony Gwynn	10232	9288	2378	543	85	135	434	24
John Smoltz	1167	948	118	26	2	5	79	3

Note – there may or may not be blank lines after the last line of data in an input file.

THE OUTPUT FILE PRODUCED

PLAYER NAME	:	AVERAGE	OPS

Aaron, Hank	:	0.305	0.928
Jones, Chipper	:	0.303	0.930
Cobb, Ty	:	0.366	0.934
Bench, Jonny	:	0.267	0.817
Gwynn, Tony	:	0.338	0.810
Smoltz, John	:	0.159	0.406

BASEBALL TEAM REPORT --- 6 PLAYERS FOUND IN FILE
OVERALL BATTING AVERAGE is 0.290

The output produced is not attempting to sort or otherwise reorder the players in the file. That will be a requirement of the next assignment(s).

Other Grading Notes in addition to the usual rubrics:

- Your project will have at a minimum a .cpp file containing the main program, and a pair of files (.cpp, .h) containing the definition and implementation of the Player class.
- Think about efficiency of execution. Avoid copying and pasting data. Use the data in your statistics array (ints) to do the computations.
- Consider encapsulation and information hiding. The player should compute its own stats based off its raw stats, not the main program.
- Consider the readability of your code. Do not use cryptic variable names.

REFERENCES

I am using the online baseball reference (www.baseball-reference.com/players) to look up batting statistics. Please note that the on-base percentage I get is slightly off from the actual percentages due to not using quite ALL of the plate appearance data in my calculations.