

=====
 *** Examples of How To Compute Offensive and Defensive Averages

Ted Williams (Boston Red Sox, 1939-1960) had these career totals:

At	Home						Total	Sac	Put-			
Bats	Hits	BB	HBP	1B	2B	3B	Runs	Bases	Fly	outs	Asst	Errs
7706	2654	2021	39	1537	525	71	521	4884	20	4158	140	113

*** Total Bases: Singles 1B 1537 x 1 = 1537 Bases
 Doubles 2B 525 x 2 = 1050 "
 Triples 3B 71 x 3 = 213 "
 Homers HR 521 x 4 = 2084 "

 Total Hits 2654 4884 Total Bases

*** Batting Average: Ted Williams, Career

$$\text{Avg} = (\text{Hits} / \text{AB}) = (2654 / 7706) = .344 \text{ Avg}$$

*** Slugging Average: Ted Williams, Career

$$\text{Slg}\% = (\text{Total Bases} / \text{AB}) = (4884 / 7706) = .634 \text{ Slg}\%$$

*** On Base Percentage: Ted Williams, Career

$$\text{OBP} = \frac{(\text{Hits} + \text{BB} + \text{HBP})}{(\text{AB} + \text{BB} + \text{HBP} + \text{SF})} = \frac{(2654 + 2021 + 39)}{(7706 + 2021 + 39 + 20)} = \frac{4714}{9786} = .482 \text{ OBP}$$

*** On Base plus Slugging (Production): Ted Williams, Career

$$\text{OPS} = (\text{OBP} + \text{Slg}\%) = (.482 + .634) = 1.116 \text{ OPS}$$

*** Fielding Average: Ted Williams, Career

$$\text{Fld}\% = \frac{(\text{PO} + \text{A})}{(\text{PO} + \text{A} + \text{E})} = \frac{(4158 + 140)}{(4158 + 140 + 113)} = \frac{4298}{4411} = .974 \text{ Fld}\%$$

*** Earned Run Average: Randy Johnson, Arizona Diamondbacks, 2001

$$\text{ERA} = \frac{(\text{Earned Runs} \times \text{Reg Innings})}{\text{Innings Pitched}} = \frac{(69 \times 9)}{249.67} = \frac{621}{249.67} = 2.49 \text{ ERA}$$