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MATH 494
Assignment 1

1.

a. Given Data:

Joe DiMaggio				
AB	H	2B	3B	HR
223	91	16	4	15

Calculation of Batting Average (BA):

$$BA = \left(\frac{H}{AB}\right)$$
$$= \left(\frac{91}{223}\right)$$
$$= 0.408$$

Calculation of Slugging Percentage (SLG):

$$SLG = \left(\frac{H + 2B + 2 \cdot (3B) + 3 \cdot (HR)}{AB}\right)$$
$$= \left(\frac{91 + 16 + (2 \cdot 4) + (3 \cdot 15)}{223}\right)$$
$$= \left(\frac{160}{223}\right) \cdot 1000$$
$$= 0.717$$

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b. Data from Lahman Database:

playerID	yearID	teamID	lgID	AB	H	2B	3B	HR	BB	HBP	SF
dimagjo01	1941	NYA	AL	541	193	43	11	30	76	4	

Calculation of Batting Average (BA):

$$BA = \left(\frac{H}{AB}\right)$$
$$= \left(\frac{193}{541}\right)$$
$$= 0.357$$

Calculation of On Base Percentage (OBP):

$$OBP = \left(\frac{H + BB + HBP}{AB + BB + HBP + SF}\right)$$
$$= \left(\frac{193 + 76 + 4}{541 + 76 + 4 + 0}\right)$$
$$= \left(\frac{273}{621}\right)$$
$$= 0.440$$

Calculation of Slugging Percentage (SLG):

$$SLG = \left(\frac{H + 2B + 2 \cdot (3B) + 3 \cdot (HR)}{AB}\right)$$
$$= \left(\frac{193 + 43 + (2 \cdot 11) + (3 \cdot 30)}{541}\right)$$
$$= \left(\frac{348}{541}\right)$$
$$= 0.643$$

Slash Numbers for Joe DiMaggio during the 1941 season with NY Yankees:

357 / 440 / 643

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2. **Given Data:**

Snuffy Stirnweiss				
SLG	H	2B	3B	HR
0.476	195	32	22	10

Calculation of At Bats (AB):

$$SLG = \left(\frac{H + 2B + 2 \cdot (3B) + 3 \cdot (HR)}{AB}\right)$$
$$AB \cdot SLG = \left(\frac{H + 2B + 2 \cdot (3B) + 3 \cdot (HR)}{\cancel{AB}}\right) \cdot \cancel{AB}$$
$$AB \cdot SLG = H + 2B + 2 \cdot (3B) + 3 \cdot (HR)$$
$$\frac{AB \cdot \cancel{SLG}}{\cancel{SLG}} = \frac{H + 2B + 2 \cdot (3B) + 3 \cdot (HR)}{SLG}$$

$$AB = \left(\frac{H + 2B + 2 \cdot (3B) + 3 \cdot (HR)}{SLG}\right)$$

$$= \left(\frac{195 + 32 + (2 \cdot 22) + (3 \cdot 10)}{0.476}\right)$$

$$= \left(\frac{301}{0.476}\right)$$

$$= 632$$

3.

a. Data from Lahman Database:

Teams from 2015					
Team ID	AB	H	2B	3B	HR
BAL	5485	1370	246	20	217
HOU	5459	1363	278	26	230
NYA	5567	1397	272	19	212
TOR	5509	1480	308	17	232
COL	5572	1479	274	49	186

Formula used for Slugging Percentage:

$$SLG = \left(\frac{H + 2B + 2 \cdot (3B) + 3 \cdot (HR)}{AB}\right)$$

SLG Results:

Teams from 2015	
Team ID	SLG
BAL	0.42
HOU	0.44
NYA	0.42
TOR	0.46
COL	0.43

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b. Data from Lahman Database:

Teams from 2015		
Team ID	W	L
BAL	81	81
HOU	86	76
NYA	87	75
TOR	93	69
COL	68	94

Formula used for Winning Percentage (WP):

$$WP = \frac{W}{(W + L)}$$

WP Results:

Teams from 2015	
Team ID	WP
BAL	0.50
HOU	0.53
NYA	0.54
TOR	0.57
COL	0.42

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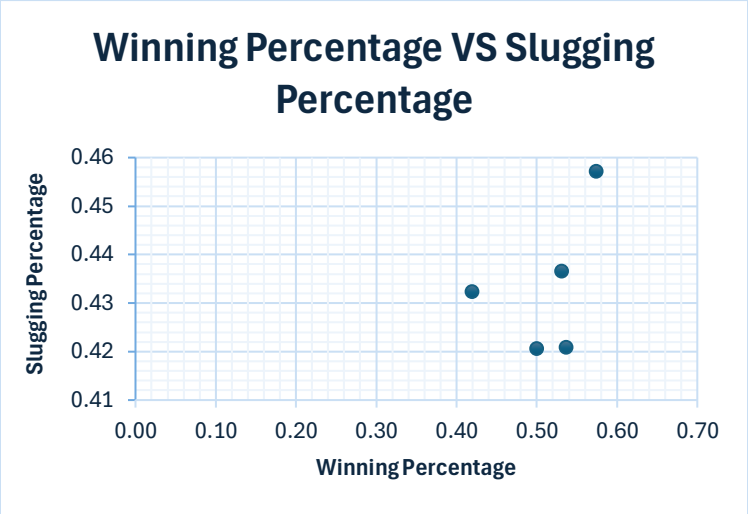
c.



$$R = 0.423$$
$$R^2 = 0.179$$

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d. Do you think there is a correlation between team slugging percentage and winning percentage?

Based on the amount of data that was used, I do not think that there is a correlation between a team slugging percentage and winning percentage. My conclusion is based on looking at the R and R^2 numbers for only these 5 teams. The R shows a low correlation and the R^2 shows that there very little variation between the two variables. However, it is very important to note that I also feel like my overall conclusion is that this correlation is inconclusive due to the very small sample size used. I think that to give a definite answer, it would require a much larger sample size.