

Here are the advertised horsepower ratings and expected gas mileage for several 2001 vehicles. Does horsepower rating have an impact on gas mileage?

Audi A4	170 hp	22 mpg
Buick LesAbre	205	20
Chevy Blazer	190	15
Chevy Prism	125	31
Ford Excursion	310	10
GMC Yukon	285	13
Honda Civic	127	29
Hyundai Elantra	140	25
Lexus 300	215	21
Lincoln LS	210	23
Mazda MPV	170	18
Olds Alero	140	23
Toyota Camry	194	21
VW Beetle	115	29

1. Make a scatterplot of the data. Read the question again to make sure you know which variable is explanatory and which variable is response.

EXP HP

Response MPG

2. Comment on the correlation. Interpret it as well.

$r = -0.88$ negatively strong

3. Find r^2 and interpret it.

$r^2 = 0.77$ 77% of change in MPG can be explained by HP,

4. Find the LSRL. Identify the variables and interpret the slope and y-intercept in context.

$$y = -0.09x + 38.58$$

slope = -0.09 For each HP, MPG decreases 0.09.

y-int = 38.58 For 0 HP, MPG = 38.58.

6. Overall, do you think a linear model fits this data well?

yes - strong r.

7. Predict the MPG for a vehicle with a 20 hp rating. Do you feel comfortable doing this? Why? What is the residual at this value?

$$y = -0.09(20) + 38.58 = 36.78 \text{ mpg.}$$

Does SAT score predict college G.P.A.?

SAT scores	College G.P.A.
1200	3
1445	3.8
1000	2.9
650	1.8
1365	3.5
800	2.4
850	2.6
950	2.7
1150	3.3

Above are the scores on the SAT and college G.P.A. for nine Freshmen in college.

1. Make a scatterplot of the data.

2. Find the correlation and interpret it in context.

$r = 0.97$ positive, strong

relationship b/w SAT and GPA,

3. Find r^2 and interpret it in context.

$r^2 = 0.94$ 94% of change in GPA can

be explained by SAT.

4. Find the Least Squares regression line and identify the variables. THEN, interpret the slope and y-intercept.

$y = 0.002x + 0.58$ Slope = 0.002 For each increase in SAT score, GPA increases 0.002 points.

$x = \text{SAT}$ $y = \text{GPA}$ y-int = 0.58 For an SAT score of 0, GPA is 0.58.

6. Predict a student's G.P.A. if they made an 1100 on the SAT.

$y = 0.002(1100) + 0.58$
 $= 2.78 \text{ GPA}$

7. Find the residual for the student who made a 950 on the SAT.
 Predict $y = 0.002(950) + 0.58 = 2.48$ Residual = Actual - Predict
 Actual (950, 2.7)

8. DO you think that a line fits this data well? EXPLAIN.

yes - strong r.

$= 2.7 - 2.48 = 0.22$