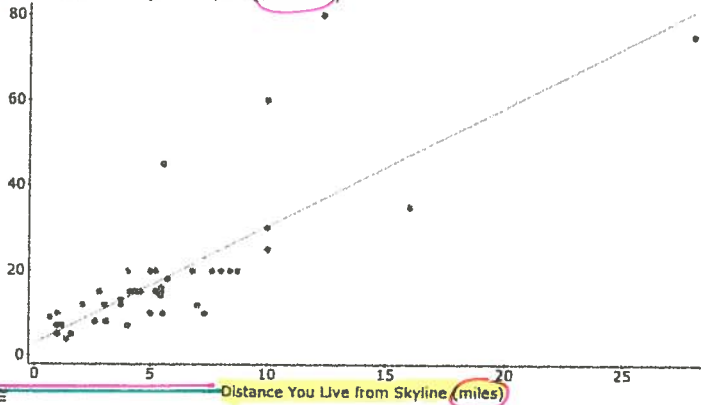


The graph below shows a scatter plot associating the distance students in our class live from Skyline and the time it takes them to travel to school.

Time It takes You to get to Skyline (in minutes)



Simple linear regression results:

Dependent Variable: Time It takes You to get to Skyline (in minutes)
 Independent Variable: Distance You Live from Skyline (miles)
 Time It takes You to get to Skyline (in minutes) = 2.6716532 + 2.7851679 Distance You Live from Skyline (miles)
 Sample size: 50
 R (correlation coefficient) = 0.79062245
 R-sq = 0.62508386
 Estimate of error standard deviation: 9.7223461

Parameter estimates:

Parameter	Estimate	Std. Err.	Alternative	DF	T-Stat	P-value
Intercept	2.6716532	2.230197	≠ 0	48	1.1979449	0.2368
Slope	2.7851679	0.31133553	≠ 0	48	8.9458722	< 0.0001

The statistics relating the associated variables are shown to the right of the graph.

- Without looking, estimate the correlation coefficient (r) for these data: ~0.8
- Identify the explanatory variable: DISTANCE
- Round decimals to two places and rewrite the regression formula relating these data:

$$\text{TIME} = 2.67 + 2.79 \times (\text{DISTANCE})$$

- Use the equation from #3 to predict the travel time for someone who lives 9.5 miles from Skyline.

$$\text{TIME} = 2.67 + 2.79(9.5) \approx 29.18 \text{ minutes.}$$

- Use the equation from #3 to predict the travel time for someone who lives 40 miles from Skyline.

$$\text{TIME} = 2.67 + 2.79(40) \approx 114.27 \text{ minutes.}$$

- Why is the answer to #5 an inappropriate application of the regression equation?

THIS IS EXTRAPOLATION. USING OUR LINEAR MODEL TO MAKE PREDICTIONS BEYOND WHAT THE DATA SUPPORT. (THE LAST DATA POINT IS AT 28 MI) - IT ASSUMES THE DATA TREND CONTINUES.

- What is the slope of the line and what does it mean in this context? (Be sure to include units and numbers in your explanation).

SLOPE = 2.79 minutes/mile MEANS THAT FOR EACH ADDITIONAL MILE OF DISTANCE YOU LIVE FROM S.C. IT TAKES AN ADDITIONAL 2.79 MIN. TO GET TO SCHOOL.

NOTE: INTERCEPT IS 2.67 MIN → MEANS IF YOU LIVED AT S.C. (0 MILES), IT TAKES YOU 2.67 MIN TO GET TO S.C.

- What is the r^2 value and what does it tell us about the regression line and these data?

$$r^2 \approx 0.63 \text{ or } 63\%$$

THIS IS ANOTHER EXAMPLE OF EXTRAPOLATION.

63% OF THE VARIABILITY IN THE TIME IT TAKES TO GET TO S.C. IS EXPLAINED BY THE LINEAR RELATIONSHIP WITH THE DISTANCE FROM S.C.