Friday Quiz 7 - Solutions - STAT 252

## Question 12

For part 3, if ptratio was 30, could you make a prediction on the median value of owner-occupied homes? If so, explain why you can do this and compute the value. If not, why not? Show all work.

## Solution

No, we **should not** make a prediction for ptratio = 30 using this linear model.

Although we can plug 30 into the regression equation to compute a value mathematically, the scatterplot shows that **all observed ptratio values are well below 30**, meaning that 30 is **outside the range of the data**.

Using the regression model beyond the range of observed data is called **extrapolation**, and the results may be **unreliable or unrealistic**. Therefore, it would not be appropriate to interpret a prediction for a ptratio of 30 in this context.

## Rubric

| **Component** | **Criteria** | **Points** |
| --- | --- | --- |
| **Extrapolation Recognized** | Correctly identifies that 30 is **outside the range of observed ptratio values**, based on the plot | 1.0 |
| **Model Use Justification** | Explains why a prediction is **not appropriate** due to extrapolation | 1.0 |
| **Interpretation of Prediction Limitation** | Demonstrates understanding that predictions beyond data range are **unreliable** or **not valid** | 1.0 |
| **Connection to Plot/Data Range** | Refers to the **plot** or observed values to support the reasoning | 1.0 |