Lab 3- Solutions - STAT 252

### **Question:**

**Which of these two explanatory variables should be used to predict miles per gallon (mpg)? Explain your idea.**

### **Solution**

We should use **wt (weight)** to predict mpg, because the linear model using wt provides a **better overall fit** than the model using hp (horsepower), based on the following reasons:

1. **Higher R-squared**:
   * The model with wt has an **R² of 0.7528**, meaning it explains about **75.3%** of the variability in mpg.
   * The model with hp only explains **60.2%** of the variability in mpg.
2. **Lower Residual Standard Error (RSE)**:
   * The residual standard error for the wt model is **3.046**, while it is **3.863** for the hp model.
   * This means predictions from the wt model are **more precise**, with less typical error.

### \*\*Rubric:\*

| **Component** | **Criteria** | **Points** |
| --- | --- | --- |
| **R-squared Comparison** | Correctly compares R² values and explains that **wt explains more variability in mpg** | 1.5 |
| **Residual Standard Error Comparison** | Recognizes that **wt has a lower RSE**, indicating more precise predictions | 1.5 |