Homework 8 - Solutions - STAT 252

## Question 12

## **Solution**

If , this means there is a **perfect positive linear relationship** between the **explanatory** and **response** variables in simple linear regression.

This implies that:

* All data points lie exactly on a **line with a positive slope**.
* As the explanatory variable increases, the response variable increases in a **perfectly consistent** and **proportional** manner.
* The correlation is not just strong — it’s **perfect**, meaning the regression line **predicts every value without error**.
* The **coefficient of determination**  would be 1, meaning **100% of the variability** in the response variable is explained by the explanatory variable.

## Rubric

| **Component** | **Criteria** | **Points** |
| --- | --- | --- |
| **Perfect Positive Relationship** | States that the relationship is **perfectly linear and positive** | 1.0 |
| **Implications for Prediction & Fit** | Mentions implications like **all points lie on the line**, or **perfect prediction / R² = 1** | 1.0 |