

Simple Linear Regression

A materials engineer at a furniture manufacturing site wants to assess the stiffness of their particle board. The engineer measures the stiffness and the density of a sample of particle board pieces. The engineer uses linear regression to determine if density is associated with stiffness.

1. Open the sample data, [ParticleBoard.MTW](#).
2. Choose **Stat > Regression > Fitted Line Plot**.
3. In **Response (Y)**, enter *Stiffness*.
4. In **Predictor (X)**, enter *Density*.
5. Click **Options**, and then select **Display confidence interval** and **Display prediction interval**.
6. Click **OK** in each dialog.

Interpreting the results

The p-value for the regression model is 0.000. Because the p-value is less than the significance level of 0.05, the engineer can conclude that the association between stiffness and density is statistically significant. However, there appears to be an outlier in the top right corner of the fitted line plot. Because the outlier could have a strong effect on the results, the engineer should investigate this point.

Model Summary

| S | R-sq | R-sq(adj) |
|---------|--------|-----------|
| 8.86937 | 84.47% | 83.89% |

Analysis of Variance

| Source | DF | SS | MS | F | P |
|------------|----|---------|---------|--------|-------|
| Regression | 1 | 11552.8 | 11552.8 | 146.86 | 0.000 |
| Error | 27 | 2124.0 | 78.7 | | |
| Total | 28 | 13676.7 | | | |

