Beta\_0 = 20

* The y-intercept on the first plot of the data increased by 10 from the original value. Put differently, the estimated y-intercept was around 25.0097 instead of 15.0097. The estimated slope value remained the same. The R-squared values remained the same. All other plots remained identical.

Beta\_0 = -10

* The y-intercept on the first plot of the data decreased by approximately 10 from the original value. Put differently, the estimated y-intercept was around -4.9903 instead of 15.0097. The estimated slope value remained the same. The R-squared values remained the same. All other plots remained identical.

Overall Beta\_0

* Increasing Beta\_0 increases the y-intercept and decreasing Beta\_0 decreases the y-intercept.

Beta\_1 = 5

* The y-intercept on the first plot of the data remained the same. Put differently, the estimated y-intercept was not impacted by changing the value of beta 1. The estimated slope increased from 1.6652 to 4.6652. The R-squared value increased from 0.6586 to 0.938 and the adjusted R-squared value increased from 0.6464 to 0.9358. All other plots remained identical.

Beta\_1 = -2

* The y-intercept on the first plot of the data remained the same. Put differently, the estimated y-intercept was not impacted by changing the value of beta 1. The estimated slope decreased from 1.6652 to -2.3348. The R-squared value increased from 0.6586 to 0.7913 and the adjusted R-squared value increased from 0.6464 to 0.7839. All other plots remained identical.

Overall Beta\_1

* Increasing Beta\_1 leads to a steeper slope and decreasing Beta\_1 leads to a less steep slope. Interestingly, shifting Beta\_1 up and down both resulted in increased R-squared and adjusted R-squared values. (The increase was more significant when Beta\_1 was increased.)

Sigma = 4

* The y-intercept value on the first plot is slightly lower. Put differently, the estimated y-intercept decreased from 15.0097 to 12.2266. The standard error of the y-intercept also decreased from 3.6258 to 1.6115. The estimated slope increased slightly from 1.6652 to 1.8512. The standard error for the slope slightly decreased from 0.2266 to 0.1007. The residual standard error was greatly lower at a value of 3.95 with 28 degrees of freedom instead of the original 8.888 with 28 degrees of freedom. The R-squared value also increased from 0.6586 to 0.9235 and the adjusted R-squared value increased from 0.6464 to 0.9207. All other plots remained identical.

Sigma = 16

* The y-intercept value on the first plot is slightly higher. Put differently, the estimated y-intercept increased from 15.0097 to 18.9062. The standard error of the y-intercept also increased from 3.6258 to 6.4459. The estimated slope decreased slightly from 1.6652 to 1.4048. The standard error for the slope slightly increased from 0.2266 to 0.4028. The residual standard error was greatly higher at a value of 15.8 with 28 degrees of freedom instead of the original 8.888 with 28 degrees of freedom. The R-squared value also decreased from 0.6586 to 0.3028 and the adjusted R-squared value increased from 0.6464 to 0.2779. All other plots remained identical.

Overall Sigma

* Decreasing sigma results in more precise output. Put differently, the error of the estimates is reduced, and the R-squared and adjusted R-squared values are increased. The opposite is true if sigma is increased.

Number = 15

* There are only 15 data points instead of the original 30. The slope and y-intercept on the first plot do not seem to have changed significantly. The estimated y-intercept was slightly lower with a value of 14.6839 compared to the original value of 15.0097. The standard error for the y-intercept increased significantly from 3.6258 to 6.1924. The slope value also increased slightly with a value of 1.8401 compared to the original value of 1.6652. The standard error for the slope also increased slightly from 0.2266 to 0.3902. The R-squared value was slightly lower with a value of 0.6311 instead of the original value of 0.6586. The adjusted R-squared value was also slightly lower with a value of 0.6027 instead of 0.6586. The other plots are also different as the 15 data points differ from the original 30. The plot of residuals vs fitted has more of a pattern than the original plot. The normal Q-Q plot follows the same general trend but has different outlying observations. The pattern of the scale-location plot is generally but increases slightly as the fitted values increase which the original plot did not. The residuals vs leverage plot is far flatter with 15 observations than it was with 30.

Number = 50

* There are 50 data points instead of the original 30. The y-intercept on the first plot is lower than the original y-intercept. The estimated y-intercept decreased from 15.0097 to 8.7188. The standard error for the y-intercept decreased from 3.6258 to 2.4491. The slope value also increased slightly from 1.6652 to 2.1374. The standard error for the slope decreased slightly from 0.2266 to 0.1643. The R-squared value was slightly higher with a value of 0.779 instead of the original value of 0.6586. The adjusted R-squared value was also slightly higher with a value of 0.7744 instead of 0.6586. The other plots are also different as the 50 data points differ from the original 30. The plot of residuals vs fitted has less of a pattern than the original plot; the curve is flatter. The normal Q-Q plot follows the same general trend but has different outlying observations. The pattern of the scale-location plot is generally but increases at higher fitted values more than the original plot did. The residuals vs leverage plot is concave up instead of the original which was concave down.

Overall number

* As the number of observations increase, the error of the estimates decrease. The outlying observations also shift as new data points are considered.