Beta\_0 = 20

* The y-intercept switched from 8.56 to 18.56. R-squared and the slope estimate did not change. The plot changed to reflect the new y-intercept. All other plots and statistics remained the same, including the residual plot and the fit plot for y

Beta\_0 = -10

* The y-intercept switched from 8.56 to -11.43. R-squared and the slope estimate did not change. The plot changed to reflect the new y-intercept. All other plots and statistics remained the same, including the residual plot and the fit plot for y

**Overall Beta\_0**

* Increasing Beta\_0 increases the y-intercept and decreasing Beta\_0 decreases the y-intercept. Changing Beta 0 has no effect on the slope with respect to the X variable, and has no effect on how much variability we are explaining (R-squared)

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 2.53 to 5.53. The R-squared value increased from 0.4224 to 0.777 and the adjusted R-squared value increased from 0.4017 to 0.7690. 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 0.4224 to -1.4638. The R-squared value decreased from 0.4224 to 0.1959 and the adjusted R-squared value decreased from 0.4017 to 0.1672. 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. Changing Beta\_1 had an impact on the R values, but did not cause the change, as the change in the Pearson Coefficient is caused by the variability.

Sigma = 4

* The y-intercept value on the first plot is slightly lower. Put differently, the estimated y-intercept increase from 8.56 to 9.36. The standard error of the y-intercept also decreased from 3.488 to 1.5503. The estimated slope decreased slightly from 2.53 to 2.23. The standard error for the slope slightly decreased from 0.56 to 0.24911. The R-squared value also increased from 0.422 to 0.7425 and the adjusted R-squared value increased from 0.4017 to 0.7333. All other plots remained identical.

Sigma = 16

* The y-intercept value on the first plot is slightly lower. Put differently, the estimated y-intercept decreased from 8.56 to 7.46. The standard error of the y-intercept also increased from 3.488 to 6.202. The estimated slope increased slightly from 2.53 to 2.95. The standard error for the slope slightly increased from 0.56 to 0.99. The R-squared value also decreased from 0.422 to 0.2388 and the adjusted R-squared value increased from 0.4017 to 0.2116. All other plots remained identical.
* .

Overall Sigma

* Increasing sigma introduces more variability into the data, hence a larger sigma results in a smaller R-squared and Adjusted R-Squared value, and deflated Sum of Squared Errors values.

Number = 15

* Reducing the sample size causes the following consequences:
  + Slope: the slope slightly decreased from 2.53618 to 2.19518
  + Intercept : the y-intercept increased from 8.56882 to 12.31353
  + R squared decreased from .4224 to 0.3431
  + Adjusted R-squared also starkly decreased .4017 to 0.2926

Number = 50

* Increasing the sample size causes the following consequences:
  + Slope: the slope slightly decreased from 2.53618 to 2.09781
  + Intercept : the y-intercept increased from 8.56882 to 9.01854
  + R squared decreased from .4224 to 0.2947
  + Adjusted R-squared also decreased .4017 to 0.2800

Overall number

* As the number of observations increase, the error of the estimates decrease. All the graphs show a much better fit as the number of observations increases. The estimation gets more and more accurate