Adjusting beta_0

beta_0 = 10:

- R^2 = 0.4224

beta_0 = 20:

- R^2 = 0.4224

beta_0 = -10:

- R^2 = 0.4224

Close to no change to the R^2 value and other output values when the y-intercept was changed. This may be due to the high variability in the data, making a change in the y-intercept make little difference to the way the model fits the data.

Adjusting beta_1

beta_1 = 2:

- R^2 = 0.4224

beta_1 = 5:

- R^2 = 0.7770

beta_1 = -2:

- R^2 = 0.1959

As the slope increased positively, the R^2 increased as well. As the slope was negative, the R^2 decreased. This suggests that the data follows a positive slope that is closer to 5 than 2.

Adjusting sigma

sigma = 9:

- R^2 = 0.4224
- Root MSE = 9.15501

sigma = 4:

- R^2 = 0.7425
- Root MSE = 4.06889

sigma = 16:

- R^2 = 0.2388
- Root MSE = 16.27558

As the standard error decreased, the R^2 increased, and vice versa. This follows theory as a decreased standard error means that the data varies less, and therefore should fit a model better.

Adjusting n

n = 30:

- R^2 = 0.4224

n = 15:

- R^2 = 0.3431

n = 50:

- R^2 = 0.2947

Both increasing and decreasing the sample size lowered the R^2. This suggests that both these actions introduced more variance to the data and therefore decreased the fitness of the model.