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| **Simulation-based Confidence Interval for a Multiple Regression** |
| **Obtaining the Sample (Observed) Regression Fit**  obs\_fit <- <NAME OF DATASET> %>%  specify(<RESPONSE> ~ <EXPLANATORY VARIABLE 1> **\*** <EXPLANATORY VARIABLE 2>) %>%  fit()  ***Note:*** Within specify(), your syntax looks identical to what you used to fit a model with the lm() function. You use a ~ to separate the response from the explanatory variables.  ***Note:*** In the above code a **\*** separates the two explanatory variables. This would fit an interaction model! If you want to fit an additive model, you would need to use a **+** sign to separate the variables! |
| **Obtaining 1000 Bootstrap Fits**  Bootstrap\_fits <- <NAME OF DATASET> %>%  specify(<RESPONSE> ~ <EXPLANATORY VARIABLE 1> **\*** <EXPLANATORY VARIABLE 2>) %>%  generate(reps = 1000, type = "bootstrap") %>%  fit()  ***Note:*** You choose the number of reps. I recommend choosing at least 1000, to get a good idea of the shape of the bootstrap distribution – remember we need to verify it is approximately normal. |
| **Obtaining Confidence Intervals**  get\_confidence\_interval(bootstrap\_fits,  point\_estimate = observed\_fit,  level = 0.90,  type = "percentile")  ***Note:*** You can specify the confidence level for your interval (e.g., 0.90, 0.95, 0.99). You can also specify what method should be used to make the interval (e.g., “percentile” or “SE”). If you choose “SE” you will need to specify the obs\_fit! |
| **Simulation-based Hypothesis Test for a Multiple Regression** |
| **Obtaining the Sample Regression Fit (Same as Above)**  obs\_fit <- <NAME OF DATASET> %>%  specify(<RESPONSE> ~ <EXPLANATORY VARIABLE 1> **\*** <EXPLANATORY VARIABLE 2>) %>%  fit()  ***Note:*** Within specify(), your syntax looks identical to what you used to fit a model with the lm() function. You use a ~ to separate the response from the explanatory variables.  ***Note:*** In the above code a **\*** separates the two explanatory variables. This would fit an interaction model! If you want to fit an additive model, you would need to use a **+** sign to separate the variables! |

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| **Obtaining 1000 Permuted Fits**  null\_dist <- <NAME OF DATASET> %>%  specify(<RESPONSE> ~ <EXPLANATORY VARIABLE 1> **\*** <EXPLANATORY VARIABLE 2>) %>%  hypothesize(null = “independence”) %>%  generate(reps = 1000, type = "permute") %>%  fit()  ***Note:*** You choose the number of reps. I recommend choosing at least 1000, to get a good idea of the shape of the bootstrap distribution – remember we need to verify it is approximately normal. |
| **Plotting the Null Distributions**  visualize(data = null\_dist)  ***Note:*** This will create **multiple** histograms, one for each variable included in the multiple regression. |
| **Shading the p-value**  visualize(null\_dist)+  shade\_p\_value(obs\_stat = obs\_fit,  direction = “two-sided”) |
| **Obtaining a p-value**  get\_p\_value(null\_dist,  obs\_stat = obs\_fit,  direction = “two-sided”) |

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| **Parametric Methods for Obtaining a p-value for Multiple Regression** |
| my\_model <- lm(<RESPONSE> ~ <EXPLANATORY VARIABLE 1> **\*** <EXPLANATORY VARIABLE 2>,  data = <NAME OF DATASET>)  anova(my\_model)  ***Note:*** In the above code a **\*** separates the two explanatory variables. This would fit an interaction model! If you want to fit an additive model, you would need to use a **+** sign to separate the variables! |