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| Word Equations **outcome = explanatory + other stuff**  **Y = X + other stuff** | Summary Tables # compute five-number summary  favstats(~ Y, data = data\_set)  # create frequency table  tally(data\_set$Y)  tally(~ Y, data = data\_set)  # tally by condition  tally(~ Y < 1900, data = data\_set)  # two-way frequency table  tally(Y ~ X, data = data\_set, margin = TRUE, format = “proportion”) | | Simple Statistics mean(data\_set$Y)  var(data\_set$Y)  sd(data\_set$Y)  cohensD(Y ~ X, data = data\_set)  cor(Y ~ X, data = data\_set)  b1(Y ~ X, data = data\_set)  b1(model\_name)  pre(Y ~ X, data = data\_set)  f(Y ~ X, data = data\_set) | |
| Basics print("Hello world!")  # assign value to object  my\_number <- 5  # combine values into vector  my\_vector <- c(1, 2, 3)  # first element in vector  my\_vector[1]  # orders values or cases  sort(my\_vector)  # arithmetic operations  sum(1, 2, 100), +, -, \*, /  sqrt(157)  abs(data\_set$Y)  # logical operations  >, <, >=, <=, ==, !=, |, &  # results in a variable with values  # of TRUE or FALSE data\_set$C <- data\_set$A > data\_set$B |
| Probability Distribution  # calculate the probability area  xpnorm(65.1, mean = 60.1, sd = 8.7)  zscore(data\_set$Y) | | Simulation # sample without replacement  sample(data\_set, 6)  # sample with replacement  resample(data\_set, 10)  # shuffle the outcome in a graph  gf\_point(shuffle(Y) ~ X, data = data\_set) | |
| Data Frame # structure of data frame  str(data\_set)  # view first/last six rows  head(data\_set)  tail(data\_set)  # select multiple variables select(data\_set, Y1, Y2)  # first six rows of selected variables  head(select(data\_set, Y1, Y2))  # select variable (a column)  data\_set$Y  # find rows that meet condition  data\_set[data\_set$Y > 40]  filter(data\_set, Y > 300)  filter(data\_set, is.na(Y) == FALSE) | # arrange rows by variable arrange(data\_set, Y)  # creates data frame from csv file  data\_set <- read.csv("file\_name", header = TRUE)  # convert quantitative variable to categorical  factor(data\_set$Y)  factor(data\_set$Y, levels = c(1,2), labels = c("A", "B"))  # transform values  recode(data\_set$Y, "0" = 0, "1" = 50, "2" = 100)  # creates two equal sized groups  ntile(data\_set$Y, 2)  # convert categorical variable to quantitative  as.numeric(data\_set$Y)  # create new variable inside a data frame  data\_set$new\_var\_name <- #code/calculations  # Ex: create variable `C` by adding `A` and `B`  data\_set$C <- data\_set$A + data\_set$B | | Fitting & Evaluating Models # empty model  empty\_model <- lm(Y ~ NULL, data = data\_set)  # use one expanatory variable  model\_name <- lm(Y ~ X, data = data\_set)  # model predictions and residuals  data\_set$empty\_predict <- predict(empty\_model)  data\_set$empty\_resid <- resid(empty\_model)  # produce ANOVA table  supernova(model\_name) | |
| Visualizations gf\_histogram(~ Y, data = data\_set) %>%  # change labels    gf\_labs(title = "Graph Title",  x = "Y\_Name", y = "Frequency")  Chart, histogram  Description automatically generated  gf\_dhistogram(~ Y, data = data\_set, fill = "orange") %>%  gf\_density()  Chart, histogram  Description automatically generated  # faceted grid of histograms  gf\_histogram(~ Y, data = data\_set) %>%    gf\_facet\_grid(X ~ .)  Chart, histogram  Description automatically generated | | gf\_point(Y ~ X, data = data\_set)  Chart, box and whisker chart  Description automatically generated  gf\_jitter(Y ~ X, data = data\_set)  Chart, scatter chart  Description automatically generated  gf\_boxplot(Y ~ X, data = data\_set)  Chart, box and whisker chart  Description automatically generated | | gf\_boxplot(Y ~ X, data = data\_set, fill = "orange") %>%  gf\_jitter(height = 0, alpha = .2, size = 3)  Diagram  Description automatically generated  gf\_bar( ~ Y, data = data\_set)  Chart, bar chart, histogram  Description automatically generated  gf\_point(Y ~ X, data = data\_set) %>%  # add model predictions as red points   gf\_point(Y ~ X , shape = 1, size = 3,  color = "firebrick") %>%  # add best fitting model as a red line   gf\_model(model\_name, color = "red")  Chart, scatter chart  Description automatically generated |