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| # loading the library  > library(faraway)  > # getting the data  > data(happy)  > head(happy)  happy money sex love work  1 10 36 0 3 4  2 8 47 1 3 1  3 8 53 0 3 5  4 8 35 1 3 3  5 4 88 1 1 2  6 9 175 1 3 4  > lmod <- lm(happy ~ money + sex + love + work, data=happy)  > summary(lmod)  Call:  lm(formula = happy ~ money + sex + love + work, data = happy)  Residuals:  Min 1Q Median 3Q Max  -2.7186 -0.5779 -0.1172 0.6340 2.0651  Coefficients:  Estimate Std. Error t value Pr(>|t|)  (Intercept) -0.072081 0.852543 -0.085 0.9331  money 0.009578 0.005213 1.837 0.0749 .  sex -0.149008 0.418525 -0.356 0.7240  love 1.919279 0.295451 6.496 1.97e-07 \*\*\*  work 0.476079 0.199389 2.388 0.0227 \*  ---  Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1  Residual standard error: 1.058 on 34 degrees of freedom  Multiple R-squared: 0.7102, Adjusted R-squared: 0.6761  F-statistic: 20.83 on 4 and 34 DF, p-value: 9.364e-09  > summary(lmod)$coefficients[5,3] #extracts the t-statistic you need for work  [1] 2.387687  >  > # critical value  > qt(.975, 34)  [1] 2.032245  > set.seed(12345)  >  > # there are 39! permutations. factorial() commands computes that for us  > factorial39 <- factorial(39)  > factorial39  [1] 2.039788e+46  >  > # sampling process  > nreps <- 5000  > v\_84 <- numeric(nreps)  > head(v\_84, 1L)  [1] 0  >  > for(i in 1:nreps){  + lmod\_permuted <- lm(happy ~ money + sex + love + sample(work, rep = FALSE), data = happy)  + v\_84[i] <- summary(lmod\_permuted)$coefficient[5, 3]  + }  >  > head(lmod\_permuted, 1L)  $coefficients  (Intercept) money sex love sample(work, rep = FALSE)  0.42822834 0.01182388 -0.58952869 2.22263577 0.15406296  > # the first 100 results  > head(abs(v\_84) > abs(summary(lmod)$coefficient[5, 3]), 100L)  [1] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE FALSE FALSE FALSE FALSE  [22] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE  [43] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE  [64] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE  [85] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE  > pdf(file="C:/Users/buchh/OneDrive/Desktop/cmp and graph in stat/hw9/density\_plot.pdf")  > plot(density(v\_84))  > dev.off()  windows  2  >  > mean(abs(v\_84))  [1] 0.8151051  > # p-value from the OLS approach  > summary(lmod)$coefficient[5, 3]  [1] 2.387687 |
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