R version 3.1.0 (2014-04-10) -- "Spring Dance"

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Platform: x86\_64-w64-mingw32/x64 (64-bit)

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> body<-read.table("http://web.mst.edu/~wenx/teaching/stat5346/data/bodyfat.txt",header=T)

> fit1<-lm(y~x1,data=body)

> fit2<-lm(y~x2,data=body)

> fit3<-lm(y~x1+x2,data=body)

> fit4<-lm(y~x1+x2+x3,data=body)

> anova(fit1)

Analysis of Variance Table

Response: y

Df Sum Sq Mean Sq F value Pr(>F)

x1 1 352.27 352.27 44.305 3.024e-06 \*\*\*

Residuals 18 143.12 7.95

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Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

> anova(fit2)

Analysis of Variance Table

Response: y

Df Sum Sq Mean Sq F value Pr(>F)

x2 1 381.97 381.97 60.617 3.6e-07 \*\*\*

Residuals 18 113.42 6.30

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Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

> anova(fit3)

Analysis of Variance Table

Response: y

Df Sum Sq Mean Sq F value Pr(>F)

x1 1 352.27 352.27 54.4661 1.075e-06 \*\*\*

x2 1 33.17 33.17 5.1284 0.0369 \*

Residuals 17 109.95 6.47

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Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

> anova(fit4)

Analysis of Variance Table

Response: y

Df Sum Sq Mean Sq F value Pr(>F)

x1 1 352.27 352.27 57.2768 1.131e-06 \*\*\*

x2 1 33.17 33.17 5.3931 0.03373 \*

x3 1 11.55 11.55 1.8773 0.18956

Residuals 16 98.40 6.15

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Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

> fit3.new<-lm(y~x2+x1)

Error in eval(expr, envir, enclos) : object 'y' not found

> fit3.new<-lm(y~x2+x1,data=body)

> fit1.new<-lm(y~x2+x1,data=body)

> fit1.new<-lm(y~x1+x2,data=body)

> anova(fit3.new)

Analysis of Variance Table

Response: y

Df Sum Sq Mean Sq F value Pr(>F)

x2 1 381.97 381.97 59.057 6.281e-07 \*\*\*

x1 1 3.47 3.47 0.537 0.4737

Residuals 17 109.95 6.47

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Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

> anova(fit1.new)

Analysis of Variance Table

Response: y

Df Sum Sq Mean Sq F value Pr(>F)

x1 1 352.27 352.27 54.4661 1.075e-06 \*\*\*

x2 1 33.17 33.17 5.1284 0.0369 \*

Residuals 17 109.95 6.47

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Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

> (381.97+3.47)-381.97

[1] 3.47

> anova(fit4)

Analysis of Variance Table

Response: y

Df Sum Sq Mean Sq F value Pr(>F)

x1 1 352.27 352.27 57.2768 1.131e-06 \*\*\*

x2 1 33.17 33.17 5.3931 0.03373 \*

x3 1 11.55 11.55 1.8773 0.18956

Residuals 16 98.40 6.15

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Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

> fit4.new<-lm(y~x2+x1+x3,data=body)

> anova(fot4.new)

Error in anova(fot4.new) : object 'fot4.new' not found

> anova(fit4.new)

Analysis of Variance Table

Response: y

Df Sum Sq Mean Sq F value Pr(>F)

x2 1 381.97 381.97 62.1052 6.735e-07 \*\*\*

x1 1 3.47 3.47 0.5647 0.4633

x3 1 11.55 11.55 1.8773 0.1896

Residuals 16 98.40 6.15

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Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

> fit5<-lm(y~x1+x3+x2,data=body)

> anova(fit5)

Analysis of Variance Table

Response: y

Df Sum Sq Mean Sq F value Pr(>F)

x1 1 352.27 352.27 57.2768 1.131e-06 \*\*\*

x3 1 37.19 37.19 6.0461 0.02571 \*

x2 1 7.53 7.53 1.2242 0.28489

Residuals 16 98.40 6.15

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Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

> f.stat<-11.55/(98.4/16)

> f.stat

[1] 1.878049

> (-1.37)^2

[1] 1.8769

> 1-pf(f.stat,1,16)

[1] 0.1894781

> summary(fit1)

Call:

lm(formula = y ~ x1, data = body)

Residuals:

Min 1Q Median 3Q Max

-6.1195 -2.1904 0.6735 1.9383 3.8523

Coefficients:

Estimate Std. Error t value Pr(>|t|)

(Intercept) -1.4961 3.3192 -0.451 0.658

x1 0.8572 0.1288 6.656 3.02e-06 \*\*\*

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Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 2.82 on 18 degrees of freedom

Multiple R-squared: 0.7111, Adjusted R-squared: 0.695

F-statistic: 44.3 on 1 and 18 DF, p-value: 3.024e-06

> summary(fit4)

Call:

lm(formula = y ~ x1 + x2 + x3, data = body)

Residuals:

Min 1Q Median 3Q Max

-3.7263 -1.6111 0.3923 1.4656 4.1277

Coefficients:

Estimate Std. Error t value Pr(>|t|)

(Intercept) 117.085 99.782 1.173 0.258

x1 4.334 3.016 1.437 0.170

x2 -2.857 2.582 -1.106 0.285

x3 -2.186 1.595 -1.370 0.190

Residual standard error: 2.48 on 16 degrees of freedom

Multiple R-squared: 0.8014, Adjusted R-squared: 0.7641

F-statistic: 21.52 on 3 and 16 DF, p-value: 7.343e-06

> anova(fit1,fit4)

Analysis of Variance Table

Model 1: y ~ x1

Model 2: y ~ x1 + x2 + x3

Res.Df RSS Df Sum of Sq F Pr(>F)

1 18 143.120

2 16 98.405 2 44.715 3.6352 0.04995 \*

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Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

> anova(fit4)

Analysis of Variance Table

Response: y

Df Sum Sq Mean Sq F value Pr(>F)

x1 1 352.27 352.27 57.2768 1.131e-06 \*\*\*

x2 1 33.17 33.17 5.3931 0.03373 \*

x3 1 11.55 11.55 1.8773 0.18956

Residuals 16 98.40 6.15

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Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

> ((33.17+11.55)/2)/(98.4/16)

[1] 3.635772

>