Assumptions

1. IV and DV X/Y are scale – score is ratio, rating is ratio
2. X/Y are normal – N > 30, yes
3. Random selection – no not access to all stats people, random assignment – no
4. Homoscedasticity – (since this is simple regression, we can do the plot first) – spread looks pretty even, yes



Step 2:

R: rating predicts scores b /= 0

N: rating does not predict scores b = 0

Step 3:

Call:

lm(formula = score ~ rating, data = JOL\_Data)

Residuals:

Min 1Q Median 3Q Max

-0.8630 -0.1577 0.1781 0.2191 0.5477

Coefficients:

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

(Intercept) 0.4522814 0.0256852 17.61 <2e-16 \*\*\*

rating 0.0041073 0.0003219 12.76 <2e-16 \*\*\*

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

Residual standard error: 0.3975 on 3667 degrees of freedom

(62 observations deleted due to missingness)

Multiple R-squared: 0.04251, Adjusted R-squared: 0.04225

F-statistic: 162.8 on 1 and 3667 DF, p-value: < 2.2e-16

EQUATION:

Score = .45 + .004\*(rating)

Y = a + b\*x (Fill in a and b, leave Y and X)

What would someone score if they rated themselves as getting at 70?

Score = .45 + .004 \* 70

> .45 + .004 \* 70

[1] 0.73

What is the standardized predictor? (BETA)

> lm.beta(output)

rating

0.2061839

Step 4:

qt(.05/2, 3667, lower.tail = F)

+ and – 1.96

Step 5:

T found = 12.76

Step 6:

Yes, reject, therefore ratings predict scores

Multiple regression

Assumptions

1. All variables are scale:
   1. Rating and score = ratio
   2. GPA, exam time, and self eff = interval
2. All variables are normal: N > 30, yes
3. Random selection and assignment: no, we don't have all stats people, no assign scores.
4. Homoscedasticity (COME BACK):

Step 2:

R: rating/gpa/self eff/exam time predict scores b/=0

N: rating/gpa/self eff/exam time do not predict scores b = 0

Step 3:

Call:

lm(formula = score ~ rating + gpa + exam\_time + selfeff, data = JOL\_Data)

Residuals:

Min 1Q Median 3Q Max

-0.9721 -0.1068 0.1449 0.2532 0.5719

Coefficients:

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

(Intercept) -0.5015570 0.1076642 -4.659 3.30e-06 \*\*\*

rating 0.0032453 0.0003333 9.738 < 2e-16 \*\*\*

gpa 0.2475065 0.0293116 8.444 < 2e-16 \*\*\*

exam\_time -0.0340944 0.0063525 -5.367 8.50e-08 \*\*\*

selfeff 0.0482720 0.0094108 5.129 3.06e-07 \*\*\*

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

Residual standard error: 0.3888 on 3664 degrees of freedom

(62 observations deleted due to missingness)

Multiple R-squared: 0.08491, Adjusted R-squared: 0.08391

F-statistic: 85 on 4 and 3664 DF, p-value: < 2.2e-16

EQUATION:

Score (Y) = -.50 + .003\*rating + .25 \* GPA + -.03\*exam\_time + .05 \* self eff

Beta:

> lm.beta(output)

rating gpa exam\_time selfeff

0.16291403 0.14217947 -0.08677813 0.08920413

Step 4:

qt(.05/2, 3664, lower.tail = F)

+ and – 1.96

Step 5:

Coefficients:

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

(Intercept) -0.5015570 0.1076642 -4.659 3.30e-06 \*\*\*

rating 0.0032453 0.0003333 9.738 < 2e-16 \*\*\*

gpa 0.2475065 0.0293116 8.444 < 2e-16 \*\*\*

exam\_time -0.0340944 0.0063525 -5.367 8.50e-08 \*\*\*

selfeff 0.0482720 0.0094108 5.129 3.06e-07 \*\*\*

Rating t = 9.738

GPA t = 8.444

Exam time t = -5.367

Self eff t = 5.129

Step 6:

Rating reject – rating predicts scores

GPA reject – GPA predicts scores

Exam reject – exam time predicts scores

Self eff reject – self effect predicts scores

Effect size: Multiple R squared = 0.08491 (medium)