Fall 2016 Final Exam

Q- 1:6

$R^2 = \frac{SSR}{SST} = \frac{968.7168}{1237.544} = 0.782$

$R^2 \rightarrow (R)^2 = 0.88^2 = 0.782$

$$F_{calc} = \frac{MSR}{MSE} = \frac{322.905}{\left(\frac{268.827}{28}\right)} = 33.63$$

$$t_{stat|Displacement} = \frac{-0.029073}{0.01696} = -1.714$$

$\hat{Y}_i = 36.480 - 0.029073\,Displ - 0.002074\,Weight - 0.751995\,Auto$

36.480 - 0.029073 * 250 - 0.002074 *3050 - 0.751995 *0 = 22.886

Q- 7:12

$R = \sqrt{R^2} = \sqrt{0.858} = 0.926$

p-value for Global F test is < 0.005

the exact p-value can be gleaned from the t-stat p-value which in case of simple linear regression is the same as the "Significance F".

Independent variable is Experience (not GMAT - typo)

Salary = 12.658 + 2.085 × Experience

=12.658 + 2.085 × 20=54.358 -> 54,358

Q- 13:16

df = (r-1)*(c-1)=(2-1)*(3-1)=2

$\chi^2_{crit|\alpha=0.05} = 5.991$

$\frac{RT.CT}{GT} = \frac{381*365}{1000} = 139.065$

p-value for 15.1 is less than 0.005 (scan)

Q- 17:19

$p_{With} = \frac{24}{55} = 0.4363$ -> p_1

$p_{Without} = \frac{36}{149} = 0.2416$ -> p_2

$H_o: p_1 \leq p_2$

$H_a: p_1 > p_2$

p-value = 0.0034

Upper limit : Midpoint+ (Midpoint-Lower Limit)

(0.4364-0.2416)+ ((0.4364-0.2416) - 0.0456)=0.344

$Pooled\ proportion = \bar{p} = \frac{24+36}{55+149} = 0.294$

Q- 21:22

Sample std. deviation -> t-test

$t_{calc} = \frac{4.6-4}{\frac{0.22}{\sqrt{25}}} = 13.63$

df = n-1 = 25-1 = 24

$|t_{crit,\frac{\alpha}{2}=0.025}|$=2.064

Q- 23:25

df=10-1=9

$t_{crit,\alpha=0.05}$=1.833

Bottom > Surface -> $\mu_d > 0$

p-value < 0.005 (scan and look for t-stat = 4.86. off the charts)

$\overline{d}$ = 0.5649-0.4845 = 0.0804

Bottom is more polluted with lead than Surface (reject H_o)