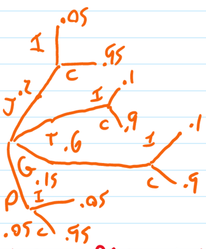
Midterm

Thursday, October 22, 2020 10:49 AM

9) CI = stat ± 2·σ/√n
= 68 ± 1.96·1.18
= 68 ± 2.32



Janet	Tom	Georgia	Peter
20%	60%	15%	5%
1/20	1/10	1/10	1/20
.01	.06	.015	.0025

(.1)/(.1+.06+.015+.0025) = .11 P(J|I) = P(J∩I)/P(I)
= (.2·.05)/(.2·.05+.6·.1+.15·.1+.05·.05)

P = .11 P = .114

10) a) Coffee: mean = 1.4, SD = .3 | Muffin: mean = 2.5, SD = .15

X = coffee Y = muffin → in cents
E(X) = 140 SD(X) = 30 Var(X) = 9000
E(Y) = 250 SD(Y) = 15 Var(Y) = 225
E(X+Y) = 140+250 = 390
Var(X+Y) = 9000+225 = 11125
SD(X+Y) = √Var(X+Y) = √11125 = 34

mean = 1.4+2.5 = 3.9 = mean
SD = .3+.15 = .45 = SD

b) mean = 3.9·7 = 27.3 = mean
SD = .45·7 = 3.15 = SD

W = weekly total
E(W) = 7·E(X+Y) = 7·3.9 = 273
V(W) = 7·V(X+Y) = 7·1125 = 7875
SD(W) = √7875 = 89

11) total = 2500 X = # of 2500 who attend X is binomial
space = 1786 p = .7 n = 2500 if X ≥ 1787, no room
p = .7 μ = np = 2500·.7 = 1750 → P(X ≥ 1787) = P(Z > 1787−1750/23) = .0537

.7·2500 = 1750 → 1750 < 1786 → there is a 0% chance of there not being enough space

13) H_0: The mean resting pulse rate of those who do not exercise is the same or less than those who do
$\mu_{not} \leq \mu_{do}$

H_1: The mean resting pulse rate of those who do not exercise is greater than those who do
$\mu_{not} > \mu_{do}$

Independent T: Use s_p not s_1 and s_2!

DF = 16+12−2 = 26 → crit T = 1.71 t = (73.9−69.1)/√96.99·(1/16+1/12)

t = (73.9−69.1)/√[(10.9²/16)+(8.2²/12)] = 4.8/√(7.425+5.603) = 4.8/3.609 = 1.329

1.329 < 1.71 → reject the null

We reject the null hypothesis that $\mu_{not} \leq \mu_{do}$ and accept the alternative that $\mu_{not} > \mu_{do}$

↓ solutions in separate file

16) a) Y/X → $(y_i-\bar{y})(x_i-\bar{x})/(x_i-\bar{x})^2$ → $S_{XY}/S_X^2 = Y/X$

slope = 296446.059 / 147911.938 = 2.004 = slope

107.43 = (128.88)(2.004) + Y
107.43 = 258.30 + Y
Y intercept = −150.87 This doesn't make sense because time has to be positive but I don't have enough time to fix it

b) For every unit increase in distance, time increases by 2.004

When distance = 0, time = −150.87

c) $XY/\sqrt{X^2Y^2}$ → (147911.938·148287.811)/√(147911.938²·148287.811²) = 1

d) SSE = 1185784.23

It's the average error in times reported vs actual and then squared

e) Y = (103)(2.004) − 150.87
Y = 55.542

18) a) R^2 = .7480

b) slope = 7.079
Intercept = −28.53

As unemployed goes up 1, murders go up by 7.079

At 0 unemployment, there are −28.53 murders (this makes no sense, but I have no time)

c) I don't know and I'm out of time :(