TRUE BLUE EXAMINATION BOOK

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Assigned Exam #

Department

Course # / Section

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1. Material Questions

(a) To get insights on the causal effect of GPA in college on interview rate. Universities and company employers would be most concerned about this because it would allow them to see if higher GPA's leads to higher interviews.

(b) Does an higher GPA lead to getting more interviews? and Standards

(c) Yes how it a confounder because it's associated with the treatment variable (GPA) and the outcome variable (interview rate).
- Someone with honor must have a high GPA and higher GPA can lead to increased interview rate.

(d) $int = a + b_1 gpa$

$a = int - b_1 gpa$

$b_1 = \frac{\sum (Y_i - \bar{Y}_i)(X_i - \bar{X}_i)}{\sum (X_i - \bar{X}_i)}$

(e) $int = 0.1 + 0.12(gpa)$

$int = 0.1 + 0.12(1) \Rightarrow 0.1 + 0.12 = 0.22$

Comment is incorrect!

If an applicant's GPA increases by 1, then the interview rate of this applicant will increase by 0.22.

(f) $int = a + b_1 gpa + b_2 hon + b_3 female$

0

$\frac{b_1 gpa}{gpa} = \frac{int - a - b_2 hon - b_3 female}{gpa}$

$b_1 = \frac{int - a - b_2 hon - b_3 female}{gpa}$

$b_1 = \frac{\sum Y_i - X}{\sum X_i}$ b_1 is the effect gpa has on int when all other variables are remained constant.

- For every 1 increase in gpa when the other units remain at 0, change int.

(g) $int = \beta_0 + \beta_1 gpa + \beta_2 hon + \beta_3 female + u$

0 $E[u \mid gpa, hon, female] = 0$

The expected value of [redacted] when the student has high gpa, hon and female of having an high interview rate is 0.

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(h) β_0 is when all the β's = 0

The change in int when the individual has gpa=0, not in honors, not female.

β_1 is the effect in int, when gpa increases or decreases, holding everything else constant.

(i) $int = \beta_0 + \beta_1 gpa + \beta_2 hsm + \beta_3 female + \beta_4 intern + u$

β_0 is when all other treatment variables = 0.
when gpa is 0, when student is not honors student, when student is not female, and when student does not have an internship.

I expect β_0 to be higher than the β_0 in item(g). because we're adding one more treatment variable, which means that our model has more variability.