

HOMEWORK 3

CHAPTER 2

Intouch Intlwadee

6104640302

2 ; U include the other factor that influence the number of kids rather than only years of education, for example, career, age. These are somewhat likely to be correlated with education.

ii No because U will start impact on regression analysis, so the regression will only show the total effect not the certain periods effect - this is because we can't control or hold the other factor constant. it is correlated with education $E(u|x) \neq 0$ so SLR4 fail

4 i $\widehat{b_{\text{weight}}} = 119.77 - 0.514(0) = 119.77$

$\widehat{b_{\text{weight}}} = 119.77 - 0.514(20) = 109.49$

The effect of smoking on additional 20 cigarettes will cause an estimate 10.28 ounce decrease in the infant birth rate

ii as the amount of cigarettes is the independent variable and infant weight is dependent variable, it implies that there is a causal effect however there is no other factor to be considered as well like genetic or parents weight, smoking habit can probably explain baby's weight

iii $125 = 119.77 - 0.519 \text{ cigs}$

$\text{cigs} = -10.17509728$ which is not possible. The lightest people weight according to the model is its β_0 which is 119.71 ounces

- iV To get an accurate sample we should get more smokers to get more data point, which will make our regression more accurate. We need more SLR 3 because 85% of the sample smoke cigs = 0. In addition SLR 2 implies that we need more sample to be better representative.

CHAPTER 3

- 1 i Yes it does make sense because if you are top of the class the 'hsperc' will be low and get high 'colgpa'.
Therefore, The coefficient is negative

$$\begin{aligned} \text{ii } \widehat{\text{colgpa}} &= 1.342 - 0.135(20) + 0.00148(1000) \\ &= 1.342 + 0.27 + 0.148 \\ &= 2.676 \\ &= 1.342 - 0.135 \text{ hsperc} + 0.00148 \text{ sat} \end{aligned}$$

- iii The predicted difference in college GPA is 0.00148(140) = 0.2072, which is large relative to 6

$$\begin{aligned} \text{iv } 0.5 &= 0.00148(\text{sat}) \\ \text{sat} &= 337.8378378, \text{ thus a } 337.8378378 \text{ difference in sat} \\ &\text{score will lead to a predicted } 0.5 \text{ colgpa difference} \end{aligned}$$

- 2 i Yes, sib3 has the expected effect because when you have more siblings your family may not be able to afford to pay more of your education or you may have to work instead.
educ: -1 = -0.094 sib3
sib3: 10.0382827, thus the number of siblings will have to increase by 11 to reduce predicted years of education by 1 year

2.ii $\text{educ}'s$ coefficient means that if the more years of schooling for the working man

$$\begin{aligned} \hat{\text{educ}} &= 10.36 - 0.054(0) + 0.13(12) + 0.910(12) \\ &= 14.952 \text{ years} \end{aligned}$$

$$\hat{\text{educ}} : 10.36 - 0.054(0) - 0.13(16) + 0.210(16) = 15.016 \text{ yr}$$

Man B will have a predicted 1.364 (15.016 - 14.952) more years of schooling than Man A