

(Q1)

- (i) The kinds of factors are contained in u is the error terms of the observation. Let age are contained in u and correlated with education. So, in this equation can't be BLUE because Ass. SLR4 is violated: $E(u_i | x_i) = 0$ which is not be true.
- (ii) ceteris paribus will holding others thing constant, have only education can't explain well about the fertility

(Q2)

$$(i) \hat{bwght} = 119.77 - 0.514(0) = 119.77$$

$$bwght = 119.77 - 0.514(20) = 109.49$$

An additional 20 cigarettes causes an estimated (119.77-109.49) decrease in the birth weight.

- (ii) As the amount of cigarettes is independent variable and the infant weight is dependent which it means that there is a causal effect. However, there are other factor to be considered as well like genetics or parent's weights. Smoking habits can partially explain about weight of baby.

$$(iii) 125 = 119.77 - 0.514 \text{ cig5}$$

$$\text{cig5} = -10.1751$$

Which it means that it is not true because it is impossible. The highest possible weight according to model would be its p_0 or interest, which is 119.77 ounces.

- (iv) To get an accurate sample, we should consider more smoker to get more data point which will make our regression less limited and more accurate. We need more sample variation in the explanatory Variable or SLR3 because 85% of the sample smoke cig5 = 0. In addition, SLR2 means we need the sample to be better representative. So, we can improve our regression function. So, it is not as limited and will give us possibly inaccurate data.

Chapter 3

(Q1)

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

$$\begin{aligned} ii) \hat{colgpa} &= 1.392 - 0.135(20) + 0.00148(1050) \\ &= 1.392 - 0.27 + 1.554 \\ &= 2.676 \end{aligned}$$

$$iii) \hat{colgpa} = 1.392 - 0.0135 \text{ hsperc} + 0.00148 \text{ Sat}$$

So, increasing in SAT score for 1 mark will make the value of $\hat{colgpa}$ change for 0.00148

A is predicted to have a score at $0.027 = (140)(0.00148)$ higher. It is quite large if we consider about S.D.

$$iv) 0.5 = 0.00148 (\text{Sat})$$

$$\text{Sat} = 337.8378$$