

## Assignment 60-3

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### A.

$$\text{Model} = 50 + 20(\text{GPA}) + 0.07(\text{IQ}) + 35(\text{Gender}) + 0.01(\text{GPA})(\text{IQ}) - 10(\text{GPA})(\text{Gender})$$

Given a fixed IQ and GPA when we vary the gender we get

$$C = 50 + 20(\text{GPA}) + 0.07(\text{IQ}) + 0.01(\text{GPA})(\text{IQ})$$

$$\text{Male} = C$$

$$\text{Female} = C + 35 - 10(\text{GPA})$$

So men earn more if the fixed  $\text{GPA} > 3.5$

### B.

$$\begin{aligned} \text{Model}(\text{GPA} = 4.0, \text{IQ} = 110, \text{Gender} = \text{F} = 1) &= \\ 50 + 20(4) + 0.07(110) + 35 + 0.01(4.0)(110) - 10(4.0) &= \\ 50 + 80 + 7.7 + 35 + 4.4 - 40 &= 137.1 \end{aligned}$$

\$137,100 as a starting salary

### C.

This is false because the interaction term is small because the 2 terms that we are finding a coefficient for are large, not because there is a low effect of the interaction. An example of this would be finding a rating from 1-10 and you have an interaction term between cost and battery life. Cost is usually between 300-1000 and battery life is between 5000-10000. So even for a low end phone the cost times the battery life is around 1,500,000. This is huge so in order to get something that will add up with our other terms to something between 1-10 we would need a tiny interaction term.