

QUESTION 2

PART A

$$\text{TARGET} = \theta_0 + \theta_1 x_1 + \theta_2 x_2 + \theta_3 x_3 + \theta_4 x_1 x_2$$

$$\theta_0 = 40, \theta_1 = 20, \theta_2 = 0.1, \theta_3 = -30$$

$$\theta_4 = 0.01, \theta_5 = 10$$

i) FIXED GPA AND AGE TECH > NONTech ?

~~Target = 40 + 20x_1 + 0.1x_2 - 30x_3 + 0.01x_1x_2 + 10x_1x_3~~

$$\text{TARGET} = 40 + 20x_1 + 0.1x_2 - 30x_3 + 0.01x_1x_2 + 10x_1x_3$$

NON-TECH : ($x_3 = 0$)

$$\text{TARGET} = 40 + 20x_1 + 0.1x_2 + 0.01x_1x_2$$

TECH : ($x_3 = 1$)

$$\text{TARGET} = 40 + 20x_1 + 0.1x_2 + 0.01x_1x_2 - 30 + 10x_1$$

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∴ ANSWER is (ii) when Tech pos. earn more on average than non-tech when GPA is high enough.

PART B [AGE = 25 GPA = 4.0]

TECH-SALARY:

$$\begin{aligned} &= 40 + 20(4) + 0.1(25) + 0.1(4)(25) + 10(4) - 30 \\ &= 40 + 80 + 2.5 + 1 + 40 - 30 \\ &= 133.5 \text{ K} \end{aligned}$$

NON-TECH

$$\begin{aligned} &= 40 + 20(4) + 0.1(25) + 0.1(4)(25) \\ &= 40 + 80 + 2.5 + 1 \\ &= 123.5 \text{ K} \end{aligned}$$