Tools For Data Science - Sam Strickler

Task 1.1: (Mod 7)

$$y_{\$} = 50 + 20x_1 + 0.07x_2 + 35x_3 + 0.01x_1x_2 - 10x_1x_3$$

Let $x_1 = C_1$ and $x_2 = C_2$ where $C_1 \in \mathbb{R}$ and $C_2 \in \mathbb{N}$

Level 1 (college) $\Rightarrow x_3 = 1$

$$\Rightarrow y_{\$}^{l_1} = 50 + 20C_1 + 0.07C_2 + 35 + 0.01C_1C_2 - 10C_1$$
$$= 85 + 10C_1 + 0.07C_2 + 0.01C_1C_2$$

Level 0 (high school) $\Rightarrow x_3 = 0$

$$\Rightarrow y_{\$}^{l_0} = 50 + 20C_1 + 0.07C_2 + 0.01C_1C_2$$

$$y_{\$}^{l_1} - y_{\$}^{l_0} = (85 - 50) + (10 - 20)C_1$$
$$= 35 - 10C_1$$

If $y_{\$}^{l_1} - y_{\$}^{l_0} > 0$, then:

$$35 - 10C_1 > 0$$
$$35 > 10C_1$$
$$3.5 > C_1 \leftarrow \text{gpa value}$$

If $y_s^{l_1} - y_s^{l_0} < 0$, then

$35 - 10c_1 < 0$

$3.5 < c_1$ ← gpa value

∴ If gpa is high enough, high school educated people earn more (on average) than college educated people if their gpa is above 3.5.