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IE 3035 Quiz 1

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1) Wild West produces two types of cowboy hats. A type 1 hat requires three times as much labor time as a type2. If the all available labor time is dedicated to Type2 alone, the company can produce a total of 450 Type 2 hats a day. Market limits for the two types are 100 and 300 hats per day Type 1, Type2 respectively. The profit is $8 per Type 1 hat and $5 per Type 2 hat. Determine the number of hats of each type that will maximize profit.

i. Build the mathematical model of the problem.

ii. Solve the problem graphically.

Answer:

$X_1 \rightarrow$ Type 1 hat

$X_2 \rightarrow$ Type 2 hat

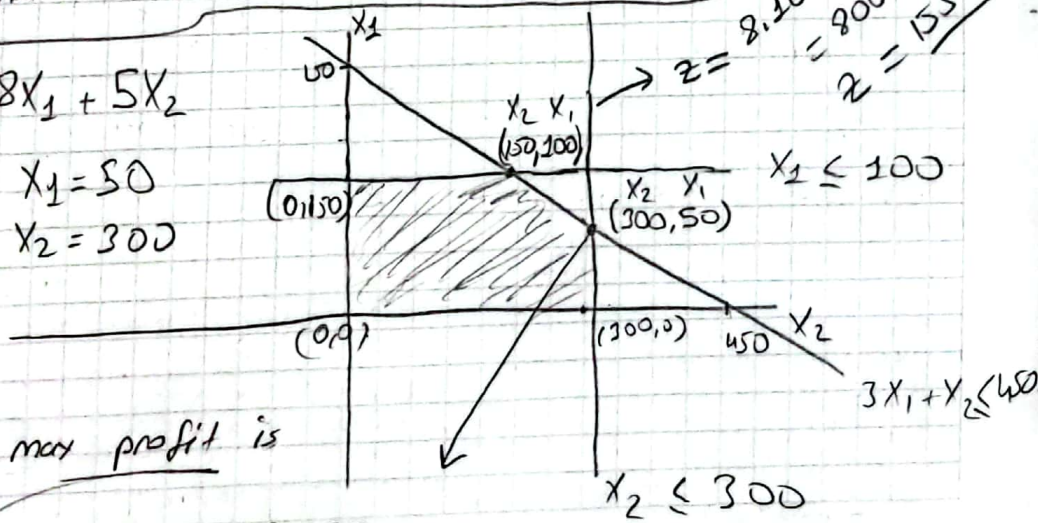
$X_1 \geq 0, X_2 \geq 0$

$3X_1 + X_2 \leq 450$

$X_1 \leq 100, X_2 \leq 300$

$\text{Max } Z = 8X_1 + 5X_2$

Optimal point is $X_1 = 50$, $X_2 = 300$



$Z = 8.100 + 5.50$

$Z = 800 + 550$

$Z = 1350$

X_1	X_2
0	450
150	0

Our max profit is

$Z = 8.50 + 5.300$

$Z = 1900$