

Grup 6 – Bölüm 5 – Soru 5

**Problem 5.5:** *Helicopter Service* Wolfe Helicopters is to begin flying passengers from a helicopter pad in Berkeley, California to the large airports in the area, Oakland and San Francisco. Wolfe will operate two models – the HG30 and the WH10-. The characteristics for each aircraft are given in the following table.

	Estimated Monthly Profit	Purchase Cost	Required Monthly Maintenance (hours)	Capacity
HG30	3.000\$	600.000\$	20	20
WH10	2.000\$	200.000\$	60	8

Wolfe has 1.800.000\$ available to purchase helicopters, and it wishes to have a total fleet capacity of at least 25. It also has a service contract with HMC –Helicopter Maintenance Company- for up to 140 hours per month.

- Formulate and solve for the mix of helicopters that would bring Wolfe its maximum monthly profit.
- Show graphically that there are only five feasible integer solutions. Evaluate the profit of each and verify that the answer to part(a) is correct.
- What would be Wolfe’s optimal mix of helicopters if it had only 1.799.999\$ available to purchase helicopters? If Wolfe had only 1.799.999\$ for the purchase of helicopters, would you “invest” a dollar with Wolfe for a small percentage of the increased profits?

**Solution:**

**a. Variables:**

$X_1$  : Number to buy HG30 helicopters

$X_2$  : Number to buy Wh10 helicopters

**b. Model:**

Maximize:  $3.000 * X_1 + 2.000 * X_2$

$600.000 * X_1 + 200.000 * X_2 \leq 1.800.000$  (Money Limit)

$20 * X_1 + 8 * X_2 \geq 25$  (Capacity Limit)

$20 * X_1 + 60 * X_2 \leq 140$  (Service Limit)

$X_1$  and  $X_2$  are integers

**Note:** You can see the solution of the problem in the excel sheet [g6-s5-p5.xls](#) with using solver for answer to section (a).

The graph for section (b) is below. As seen from the graph there are only 5 feasible integer solutions for this problem. The points are (1,1), (2,1), (1,2), (0,2), and (0,3) . Their monthly profits are shown in following table.

Solution	(1,1)	(2,1)	(1,2)	(0,2)	(0,3)
Profit	5000\$	7000\$	8000\$	6000\$	9000\$

For section (c) I do not invest Wolfe for a dollar. Because spending a dollar causes 400.000\$ dollars of spending money (diffirence between (0,3) and (1,2) points). But the increase in income is only 1000\$. So I do not.

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