LABORATION- MA069G

Exercise: A farmer has recently acquired a 110 hectares piece of land. He has decided to grow wheat and barley on that land. Due to the quality of the sun and the region's excellent climate, the entire production of wheat and barley can be sold. He wants to know how to plant each variety in the 110 hectares, given the costs, net profits and labour requirements according to the data shown below:

Variety	Cost (krs/hector)	Net profit/hector	Labour/hector
Wheat	110.50	51.50	11
Barley	198.50	119.50	32

The farmer has a budget of 12000 krs and availability of 1250 man-days during the planning horizon. Find the following:

1. Write the objective function and linear inequality constraints for the given linear programming problem.

2. Using graphical method in *matlab*, find the amounts areas in the 110 hectares, at which he should grow of Barley and wheat that so as to make his profit maximum.

3. Find the feasible region satisfied by all the linear inequality constraints using graphical method in Matlab.

4. Now if according to the government rule he is supposed to pay 2 krs extra tax for each hectors of areas above the first 50 hectors for either kind of plants. Then,

    i. Write the new objective function and linear inequality constraints for the above linear programming problem with the additional condition given in (4).

    ii. Using linprog command solve the linear programming problem with the lowest extra tax so as to make the maximum profit of the farmer.