1. Producer of tea mixtures is producing two kinds of tea mixtures from Chinese, Ceylon and Indian teas. In table, there are set capacities of available teas, the ratio of components needed to produce a mixture and profits for 1 ton of mixture.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Mixture 1 | Mixture 2 | Capacity (t) |
| Chinese tea | 0,4 | 0,1 | 160 |
| Ceylon tea | --- | 0,5 | 90 |
| Indian tea | 0,6 | 0,4 | 200 |
| Profit (Euro/t) | 12000 | 8000 |  |

1. Write down the mathematical model maximizing the firm’s profit (optimal production program).

1. Write down one impossible solution.

3. Solve the problem using MS Excel program

Solution:

4. Write down the dual problem of the model

5. Solve the dual problem using MS Excel program

Solution:

6. Write down the stability intervals for Chinese, Ceylon and Indian tea.

7. How much will be the profit increase under the condition that the capacity of Ceylon tea would increase by 1 ton?

8. Is vector (20000,30000,50000) feasible solution to the dual problem?

9. Is vector (50,100) a feasible solution to the primal problem?

10. Write down the profit corresponding to a vector (30,30).

11. Write down the objective function value of the dual problem corresponding to shadow prices (1000, 1000, 1000).