Concepts and Algorithms of Optimization – Series 8

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The company *Fancy Pottery* has to decide on the usage of excess capacity in the manufacturing process. In addition to the current production of bowls, *Fancy Pottery* can produce cups (product 1) and plates (product 2).

The following table describes the required working time in each of the three work steps Cutting, Painting and Wrapping for cups and plates. The working time and the amount of excess capacity per task are stated in minutes. The contribution margin of the items is given with 1 € per cup and and with 2 € per plate, respectively.

Process	Working time per unit		Capacity
	cups (1)	plates (2)	
Cutting	0	8	640
Painting	6	6	720
Wrapping	6	3	600

Maximizing the total profit of the company, how many cups and plates can be produced with regard to the excess capacities?

(a) Assume that the production of unfinished items can be completed at a later point in time and give the linear programming formulation of the optimization problem.

(b) Solve the problem graphically.

(c) State the LP-standard-form of the given problem.

(d) Solve the optimization problem by means of the simplex algorithm and indicate the occurring basic solutions in the graph.