Assignement 4

Code of Conduct

The principle is trust, participation and collaboration for better learning. So please, do your best to learn and don't try to cheat. It is allowed and encourage to collaborate with others but for the purpose of learning, not just copy-pasting. You are allowed to consult and get inspired by external resources, but you should mention them in your report.

NB!

You may be asked to explain your work to the student assistents and/or the course responsible. Typically via a random selection, or some other relevant reasons such as the permission to use a good quality work as a good example, or of course in case of suspicion of plagiarism.

Delivery

Write a short and concise report in which you solve the following tasks. Add code sections when ever necessary, and a link to your GitHub repository if you find more convenient.

	Machine time	Craftsman time
Product X	15	20
Product Y	20	30

Table 1: Machine and Craftsman

1 From previous exam (December 2012)

A manufacturing plant produces two products (X and Y). There are two types of resources needed to produce X and Y: machine resource for machining the product automatically, and human resource (craftsman) for hand finishing. Table 1 gives the number of minutes required to produce each product:

- Production capacity: On weekly basis, the manufacturing plant has 40 hours of machine time available and 35 hours of craftsman time.
- Costs: machine time costs £100 per hour and craftsman time costs £20 per hour.
- Revenues (sales price) of the products: £200 for X and £300 for Y.
- Constraints: the plant must produce at least 10 products of X per week for a particular customer.

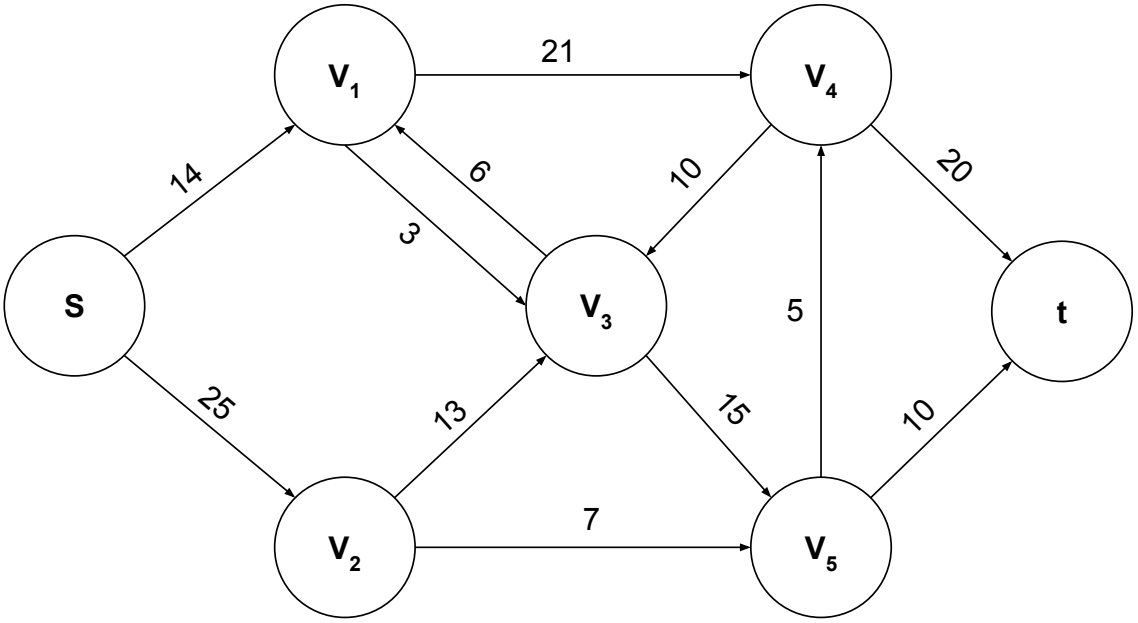
Formulate the problem as a Linear Programming, in order find how much of X and Y to produce per week. Solve it programmatically using a linear programming package.

2 Problem Maximum Flow

Given the flow network G in the Figure.

a) Frame the problem of identifying the bottleneck network cut that separates the source from the sink as an optimization problem, and subsequently address and resolve this problem programmatically using the optimization package of your choice.

b) Frame the problem of finding the maximum flow at the edges of the network as an optimization problem and solve it with the optimization package of your choice.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