Universidade de Lisboa

INSTITUTO SUPERIOR TÉCNICO

Department of Chemical Engineering

"Planning and Operational Research"

(Planificação e Investigação Operacional)

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Suggestions for a SUPPLEMENT

In the context of Operational Research nowadays, any *supplement* is to consider the presence of its functionality and results on the Internet. So, subparagraph[1] 1 should be considered as an advantage. Also, the objective of publishing the study in a congress or scientific journal should not be discarded. Note that the *article* that accompanies the Master's Dissertation was conceived for that purpose, although rarely accomplished. (Below, "Sigma" is the IST webpages' computer system.) Here are some suggestions of supplements:

1) Construct your own webpage with results from your work (in P&OR or other subject). Every pupil has his own webpage space, whether it has been used or not. See the DSI[2] (CIIST) webpages.

2) At Sigma, install the Lindo API ("application programming interface") and connect it as a Linear Programming solver to an Internet-friendly standard language (such as Fortran, C, maybe Matlab/Octave, Java). With a standard language and Lindo (free version), reasonably complex LP and MILP problems can be solved.

3) Take a problem model from the (solved) examples in the book by H. P. Williams [1999]. This is a precious book on the subject, although there are several errors in some problems, because the author addresses topics in many areas that are not his own.

4) Shortest path (Dijkstra's) algorithm: finds the shortest path in graphs. This is useful in various applications, such as finding the best synthesis route, besides the basic problem of finding the shortest path in a map.

5) Monte Carlo simulation: this technique permits the probabilistic simulation of systems with no simple analytical resolution. For instance, calculate the "best" size of a reservoir that must contain a random quantity of liquid (or granular material).

6) Other topic either in the P&OR course or in the pupil's interest, possibly taken from another course.

Bibliography

—WILLIAMS, H. Paul, 1999, "Model building in Mathematical Programming", 4.th ed., John Wiley (IST library, several editions)

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[1] "Subparagraph" — (Pt) "alínea".

[2] DSI: Direcção de Serviços de Informática. See (self-service) quem-tem-acesso-ao-cluster-sigma, login (Fénix), go (or directly) to https://ciist.ist.utl.pt/servicos/self_service/, and choose.