Decision Support:
Study Requirements and Procedure

Jožef Stefan International Postgraduate School, Ljubljana
Programme: Information and Communication Technologies [ICT3]
Course Web Page: http://kt.ijs.si/MarkoBohanec/DS/DS.html

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Purpose and Goals

• General understanding of Decision Support:
  – decision making and decision support: areas and disciplines
  – decision process
  – components of decision making

• Decision Analysis:
  – modeling methods and techniques
  – decision making under risk and uncertainty
  – decision tables, decision trees, influence diagrams
  – multi-attribute models: MAUT, AHP, DEX

• Advanced Topics:
  – integration of decision trees, influence diagrams and multicriteria models
  – integration of data mining and decision modeling
  – integration of qualitative and quantitative modeling
  – machine learning and revision of decision models

• Acquiring practical skills for decision modeling and solving complex decision problems

Required Reading

1. Main sources:
   a. for Slovene-speaking students:
        Chapters: required 1-7 & 9-14, recommended 8 & 15-17
   b. for English-speaking students:
      • + other literature covering equivalent topics (see the course web page)

2. Course slides in English:
   http://kt.ijs.si/MarkoBohanec/DS/DS.html

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Required Reading

Supplementary Reading

For further information, see:
http://kt.ijs.si/MarkoBohanec/DS/DS.html

A Typical Practical Assignment

1. Define your own decision problem
   (possibly real, about 15-20 attributes, 5-10 alternatives)
   [consult the professor about your decision problem and get approval]

2. Select two decision modeling methods (e.g. decision tree, influence diagram, Kepner-Tregoe, AHP, DEX, …)

3. Solve the problem using the methods: develop two models, evaluate and analyse alternatives, compare and assess the results

4. Write a report and submit it to your professor

5. Once approved, prepare a presentation and publicly present your work
Issues to be Addressed in the Report

In general, the report and presentation should address the following:

• Description of the decision problem, aims and goals of the decision
• Description of the developed models: attributes, utility functions
• Description of alternatives
• Utilisation of the models: evaluation of alternatives, sensitivity and/or what-if analysis
• Summary of the decision-making process, lessons learned
• Also make sure to provide the models in form of files (recommended) or printed out in an Appendix of the report

Requirements and Procedure

• Each student is required to make their Practical Assignment and write a report.
• The report must be sent by e-mail to marko.bohanec@ijs.si no later than the last Friday, 12:00 a.m., before the presentation/examination event. Sending reports for earlier previews is encouraged.
• A final printed version of the report must be handed to the examiner before presentation.
• Examinations consist of two parts:
  – A 45-minute written exam with questions addressing topics from the required literature (from both a theoretical and practical viewpoint).
  – A 10-15 minutes oral defense of each student’s seminar work (preferably accompanied by PowerPoint slides).
• For passing the examinations, both parts have to be evaluated positively. Each part contributes 50% to the final evaluation.