

Assignment # 4

Decision Analysis

ADM2302 students are reminded that submitted assignments must be neat, readable, and well-organized. Assignment marks will be adjusted for sloppiness, poor grammar and spelling, as well as for technical errors. This assignment can be done in a group of one, two, or three students. Plagiarism on assignments will not be accepted, each student must sign the statement of integrity. **Solutions to the Case Study are to be prepared using the Report to Management format provided in the ADM2302 Course Outline.**

This assignment can NOT be hand written.

The assignment is to be submitted electronically as a single PDF file via BrightSpace by Wednesday December 5th prior to 23:59. Front page of the document has to include title of the assignment, course code and section, student names and student numbers. The second page is the statement of integrity that must be signed by all group members.

Assignment total (65 marks)

Presentation as a Report to Management (10 marks)

Problem 1: Jerome's preparation for hip surgery (20 marks)

Jerome Bright, an administrative employee of uOttawa, has injured his hip in a fall and will need to undergo surgery. He is a bit overweight and he needs to lose some pounds before the surgery for it to be easier to perform, and have a quicker recovery afterwards. Dr. Passe presented him with a choice: (1) severe and immediate diet, or (2) moderate diet with metabolism boosting pill supplements. The doctor believed that if Jerome strictly followed either of these options, then he could indeed end up with optimal weight by the time he will undergo surgery. An alternative option of "just exercise" (with no added requirement for diet or pills) is also available for Jerome, but will need a very high commitment from him to be able to achieve the same weight-loss results.

Jerome is considering the "just exercise" option and the "optimal weight at surgery" state as most desirable, and he assigned it a score (payoff) of +10. Since it would be difficult to go on the severe diet, he assessed the score of "Severe Diet" and the "optimal weight at surgery" state as only +7, and finally, since he did not like taking pills, he assessed the score of "Moderate Diet + Pills" and the "optimal weight at surgery" state as only +8.

He also gave a score of -9 to the case of "Still overweight" under the "Severe Diet" option, while assigning a score of -15 for the "Still overweight" after the "Moderate Diet" option that included taking pills. Finally, he assigned a score of -12 to the "Just exercise" and the "Still overweight" outcome.

Note: It is assumed that the only possible outcomes are: (1) "optimal weight at surgery", or (2) "Still overweight".

Help Jerome make a decision on which of the available options to carry out by writing out the payoff table and analyzing the problem. Justify your selection of the appropriate option according to the (a) Maximin criterion and then (b) Minimax regret criterion. Justify your advice in a report to Jerome using the two decision criteria to recommend in your report the best option.

Problem 2: Jerome's claim for damage (35 marks)

Jerome claims to have injured himself as a result of falling from the icy stairs of Tabaret hall due to snow being not properly removed after early snowfall and low temperatures in mid-November in Ottawa. As a result of the bad fall, Jerome will not be able to work for a while and will need to undergo surgery to repair a broken hip. Jerome, upon suggestion of his private insurance, is suing the subcontractor in charge of snow removal for negligence because, despite the snowfall was predicted by the weather forecast several days in advance, no shoveling or salting took place for two days after the first snowfall. Jerome is asking for damages of \$1.5 million considering both the loss of working days, the decreased quality of life, and the high costs of surgery/hip replacement.

As a result of some initial negotiation Jerome offered to accept a settlement of \$750 thousand. Snowclear, the snow removal contractor, thus has a few options: One is to accept the settlement and pay Jerome the agreed \$750 thousand. Snowclear lawyers are also suggesting an alternative approach consisting in a counter-offer of \$400 thousand in the hopes he will accept a lesser sum in order to avoid lengthy and costly process of a full-fledged trial. However, Jerome strongly believes in his case and might still decide to refuse the counter-offer and let the judge and jury decide the proper sum to be paid (if any) by Snowclear during a trial. More specifically, Jerome can react in one of three ways: (1) accept the counteroffer of \$400 thousand, (2) reject the counteroffer and take the case to court for a full trial where jury will decide, (3) Jerome himself will make a counteroffer of \$600 thousand for settlement. If (3) happens then it will be Snowclear's call on whether to accept such counteroffer and pay Jerome the \$600 thousand or go to trial.

If the case goes to trial there are three possible outcomes: (1) the jury may reject Jerome's claim and Snowclear will owe nothing, (2) the jury will award Jerome the \$750 thousand agreed upon during initial negotiation between the parties, (3) the jury will conclude that Jerome has a strong case and sentence Snowclear to pay him the full \$1.5 million Jerome initially requested.

Key considerations when preparing Snowclear's strategy on how to handle the situation are the probabilities associated with Jerome's response to the counteroffer of \$400 thousand, and the probabilities associated with the three possible outcomes for the trial. Based on historical cases similar to Jerome's, Snowclear's lawyers estimated that he will accept the counteroffer of \$400 thousand with a probability of 0.10, that the probability of Jerome rejecting the counteroffer of \$400 thousand is 0.40, and that the probability of Jerome himself making a counteroffer of \$600 thousand is 0.50. If the case goes to trial they believe that the jury will award Jerome the full damage of \$1.5 million is 0.30, the probability that the jury will award Jerome \$750 thousand is 0.50, and the probability that the jury will award Jerome nothing is 0.20.

Perform an analysis of the problem facing Snowclear and its legal department and prepare a report that summarizes your analyses and final recommendations. Please include:

1. A decision tree modeling the problem
2. A recommendation on whether to accept Jerome's initial offer of settlement for \$750 thousand
3. A decision strategy that Snowclear should adopt if they decide to go ahead with their counteroffer of \$400 thousand