Turn in Assignment #2; Due on or Before Start of Class on Monday March 8 (03/08/21).

Recall the problem 15.6-7 (or 16.6-7 or 16.5-7, depending on which text edition you have) in the book. Everything in this assignment will be a variation of that problem.

I am providing you with the Bayes Decision tree along with the optimal decision for this problem on the next page. Use it if you need it.

Note: What I am looking for is a written-out solution in your own words, explaining how you got the answer. You don't need to provide a decision tree, if you don't want to. If you do provide a decision tree, please make sure that you also provide a written justification of your answer as well. If you only provide an annotated decision tree without an answer articulated in your own words, it will not be accepted as the proper solution.

Problem 1. (15 pts) Consider the problem 15.6-7, but now suppose that both the cost of testing and the cost of treatment are zero (free). Everything else stays the same as in the original problem. Describe the optimal decision as well as the second best decision. You must provide the justification as well as the expected utility of both decisions. For example, if the decision involves testing, you need to describe the best course of action and the expected utility of the outcome when the test is positive and when the test is negative.

Problem 2. (10 pts) Suppose that the cost of testing is the same as in the original problem (2 points), but the cost of treatment is much higher. What should the cost of treatment be in order to force the optimal decision (in terms of expected utility) become "*Don't test for A and don't treat A*".

Problem 3. (10 pts) Suppose everything is the same as in problem 15.6-7, except that the expected utility of *living with poor health* is 20 points (instead of 10). Describe the optimal decision and the corresponding utility value.

Submission Instructions

Failure to follow these steps may result in your submission not being graded.

1. Write Down Your Name and your BU ID

2. Your file name MUST be in the form Last Name_First Name.pdf (I would submit as Krigman_Steven.pdf)

3. Email me a copy in a single file, with the subject: *MA 570; Turn In Assigment #2*. → Cut & Paste this subject title.

a. Do not send multiple files!

b. Attach the single file to your email; do not "drag and drop" it into your email message body.

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Problem 15.6-7 Solution: *Optimal policy is to not test for disease A, but to treat for A.*