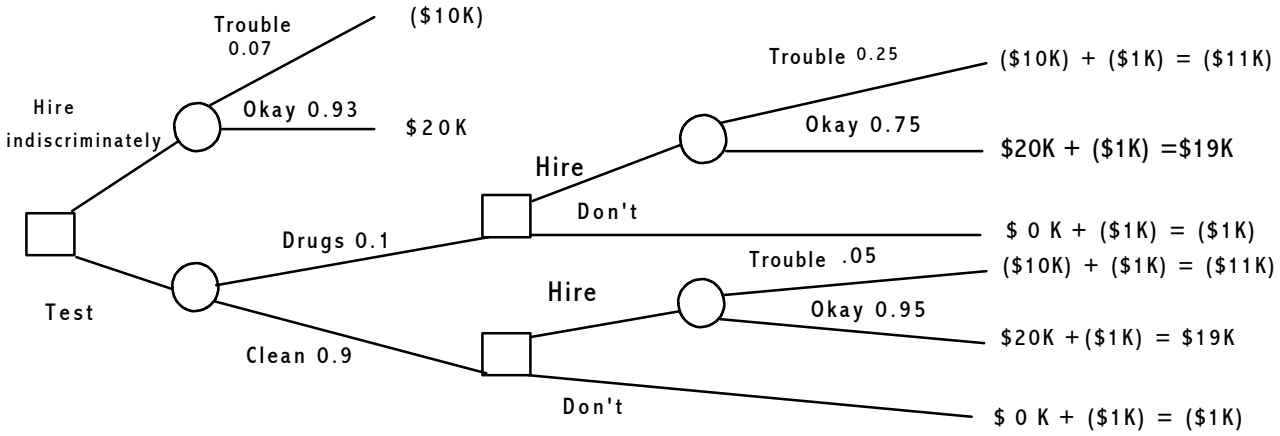
A decision tree on whether to test employment candidates for substance abuse:

(these are actual data)

Employees with drug abuse habits have a higher probability (25%) of causing trouble than employees who don't have habits (5% probability of causing trouble). You have a test for drug abuse that is 100% reliable, and it only costs $1000 per candidate. It would only be used on the preferred candidates for jobs that are available now and who had met all other criteria. Ten percent of job candidates who get this far have drug abuse habits.
Six percent of all candidates at this level would cause trouble as employees.
Employees who don't cause trouble result in $20K profits over the average tenure of employment. Employees who cause trouble result in losses of $10K.
These data would result in the following tree:

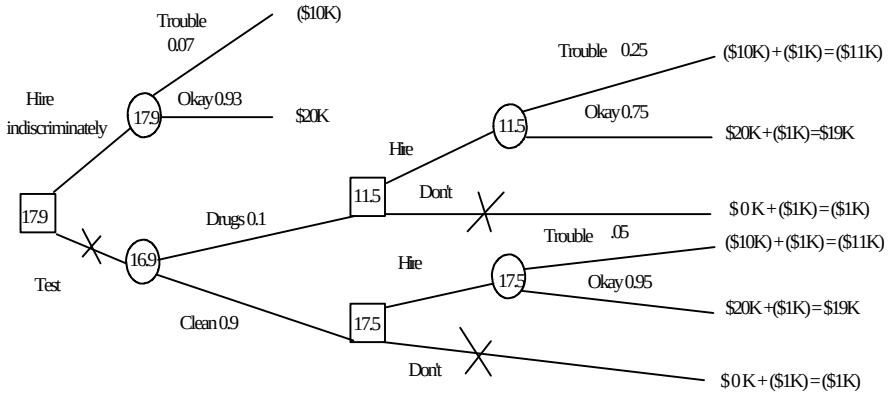


A) Calculate values at the intermediate nodes (branch points) and show decisions.

B) To maximize EMV, which alternative would you choose?

B) How much is the test worth? Explain this result.

C) Since the Drug test is 100% reliable in identifying drug users, is this test value the value of perfect information on troublemaking employees?



Hiring indiscriminately is the highest EMV alternative. Hiring indiscriminately saves the cost of testing, and so is $1K higher in return. The value of testing is zero as the same decision is made regardless of the information given by the test. The information isn't used for anything. The reason for this is that it's still a good bet to hire people with drug habits as they're not guaranteed to be troublemakers.

The test gives reliable information on drug habits, but isn't a perfect predictor of troublemaking. Therefore, the information isn't perfect.

What this model leaves out is that, given a limited number of employees, the average payoff is higher for clean employees rather than users. In that case, the decision would be between hiring clean employees vs. hiring users, and the test would make a difference and have value.