Exercise 16.9

Question

16.9 Sonny's PV's
Sonny Reyes (see Problem 15.6) must decide how to manufacture the PV panels. He has three choices:

- Develop a new method
- Alter existing methods
- Get an outside firm to produce them

Developing the new method would yield a profit of $11 million if successful, and if it cannot be developed, the outside firm must be used for a profit of $2M. There is a 70% chance that the new method will be successfully developed.

Altering the existing method successfully will yield a profit of $7M, and there is a 90% chance of the alterations being successful. If not successful, the outside firm must be used for a profit of $3M. If used immediately, the outside firm will definitely be able to produce the panels and this would lead to a profit of $5M.

Neglecting any time considerations,
(a) Structure the decision tree.
(b) Solve and select the best strategy.

Problem 15.6:

15.6. Sonny Reyes
Sonny Reyes, the famous photovoltaic (PV) manufacturer, is testing a new PV panel. If a panel does not meet specifications it has a 80% chance of failing the test. A panel that does meet specifications has a 20% chance of failing the test. Overall, four in five panels meet specifications.
(a) Define the formula for the prior likelihood ratio for this problem.
(b) Define the conditional likelihood ratios for this problem.
(c) Write the formula for the posterior likelihood ratio, if a panel first fails and then passes a second test.
(d) Solve for the posterior probability of a panel meeting specifications.

Solution from Manual

16.9 Sonny's PV's
a) See Figure S16.9.
b) Pick new method, EV = 8.3.
Figure S16.9

Sonny's P/Us