

## Decision Analysis

In the following table expected *profits* for three products and four possible states of the world are given.

Product	States of the World			
	I	II	III	IV
1	60	20	90	10
2	50	80	20	70
3	70	40	60	80

1. Which product will you select according to the optimistic rule?  
 \*a. 1   b. 2   c. 3   d. two of the products are tied   e. all three products are tied.
2. Which product will you select according to the pessimistic (conservative) rule?  
 a. 1   b. 2   \*c. 3   d. two of the products are tied   e. all three products are tied.
3. Which product will you select according to the minimax regret rule?  
 a. 1   b. 2   \*c. 3   d. two of the products are tied   e. all three products are tied.
4. Suppose that you can estimate the probabilities to be 0.2, 0.1, 0.2, 0.5 for the four states of the world, respectively. Which product will you select according to the expected value rule?  
 a. 1   b. 2   \*c. 3   d. two of the products are tied   e. all three products are tied.
5. What is the expected profit?  
 a. 37   b. 57   \*c. 70   d. 76   e. none of the above
6. What is the Expected Value of Perfect Information?  
 \*a. 10   b. 12   c. 14   d. 16   e. none of the above
7. What is the expected value of Perfect Information if the values in the table were costs rather than profits?  
 a. 10   b. 12   c. 14   \*d. 16   e. none of the above

In the following table expected *costs* for three products and three possible states of the world are given.

Product	States of the World		
	I	II	III
1	0	4	7
2	7	3	0
3	6	5	1

8. Which product will you select according to the optimistic rule?  
 a. 1   b. 2   c. 3   \*d. two of the products are tied   e. all three products are tied.
9. Which product will you select according to the pessimistic (conservative) rule?  
 a. 1   b. 2   \*c. 3   d. two of the products are tied   e. all three products are tied.

10. Which product will you select according to the minimax regret rule?  
 a. 1    b. 2    \*c. 3    d. two of the products are tied    e. all three products are tied.
11. Suppose that you can estimate the probabilities to be 0.5, 0.3, 0.2 for the three states of the world, respectively. Which product will you select according to the expected value rule?  
 \*a. 1    b. 2    c. 3    d. two of the products are tied    e. all three products are tied.
12. What is the expected cost?  
 a. 2.1    \*b. 2.6    c. 4.1    d. 4.7    e. none of the above
13. What is the Expected Value of Perfect Information?  
 a. 0.9    b. 1.2    \*c. 1.7    d. 2.6    e. none of the above

**In the following table expected costs for three products and four possible states of the world are given.**

Product	States of the World			
	I	II	III	IV
1	90	10	70	20
2	30	80	40	50
3	20	40	90	80

14. Which product will you select according to the optimistic rule?  
 \*a. 1    b. 2    c. 3    d. two of the products are tied    e. all three products are tied.
15. Which product will you select according to the pessimistic (conservative) rule?  
 a. 1    \*b. 2    c. 3    d. two of the products are tied    e. all three products are tied.
16. Which product will you select according to the minimax regret rule?  
 a. 1    b. 2    \*c. 3    d. two of the products are tied    e. all three products are tied.

**Suppose that you can estimate the probabilities to be 0.2, 0.3, 0.2, 0.3 for the four states of the world, respectively.**

17. Which product will you select according to the expected value rule?  
 \*a. 1    b. 2    c. 3    d. two of the products are tied    e. all three products are tied.
18. What is the expected profit?  
 \*a. 41    b. 48    c. 53    d. 58    e. none of the above
19. What is the Expected Value of Perfect Information?  
 a. 15    b. 16    \*c. 20    d. 26    e. none of the above

20. What is the expected value of Perfect Information if the values in the table were profits rather than costs?  
 a. 15   b. 16   c. 20   \*d. 26   e. none of the above

**In the following Table expected *costs* for three products and four possible states of the world are given.**

Product	States of the World			
	I	II	III	IV
1	25	27	26	33
2	23	20	29	28
3	31	37	22	12

21. Which product will you select according to the optimistic rule?  
 a. 1   b. 2   \*c. 3   d. two of the products are tied   e. all three products are tied.
22. Which product will you select according to the pessimistic (conservative) rule?  
 a. 1   \*b. 2   c. 3   d. two of the products are tied   e. all three products are tied.
23. Which product will you select according to the minimax regret rule?  
 a. 1   \*b. 2   c. 3   d. two of the products are tied   e. all three products are tied.
24. Assume that the probabilities are the same for the four states of the world. Which product will you select according to the expected value rule?  
 a. 1   \*b. 2   c. 3   d. two of the products are tied   e. all three products are tied.
25. What is the expected cost?  
 a. 22.75   \*b. 25   c. 27.75   d. 28   e. none of the above
26. What is the Expected Value of Perfect Information?  
 a. 4.75   b. 5.25   \*c. 5.75   d. 7   e. none of the above

**Now suppose that the values in the table represent profit rather than cost. Answer the following four questions based on the above information.**

27. Which product will you select according to the minimax regret rule?  
 \*a. 1   b. 2   c. 3   d. two of the products are tied   e. all three products are tied.
28. Which product will you select according to the expected value rule?  
 \*a. 1   b. 2   c. 3   d. two of the products are tied   e. all three products are tied.
29. What is the expected profit?  
 a. 22.75   b. 25   \*c. 27.75   d. 28   e. none of the above
30. What is the Expected Value of Perfect Information?  
 \*a. 4.75   b. 5.25   c. 5.75   d. 7   e. none of the above