

Decision Analysis

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

<table>
<thead>
<tr>
<th>States of the World</th>
<th>Product I</th>
<th>Product II</th>
<th>Product III</th>
<th>Product IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>60</td>
<td>20</td>
<td>90</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>50</td>
<td>80</td>
<td>20</td>
<td>70</td>
</tr>
<tr>
<td>3</td>
<td>70</td>
<td>40</td>
<td>60</td>
<td>80</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>States of the World</th>
<th>Product I</th>
<th>Product II</th>
<th>Product III</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>2</td>
<td>8</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>7</td>
<td>6</td>
<td>2</td>
</tr>
</tbody>
</table>

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. 3.1  *b. 3.6  c. 5.1  d. 5.7  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.

<table>
<thead>
<tr>
<th>States of the World</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>90</td>
<td>10</td>
<td>70</td>
<td>20</td>
</tr>
<tr>
<td>II</td>
<td>30</td>
<td>80</td>
<td>40</td>
<td>50</td>
</tr>
<tr>
<td>III</td>
<td>20</td>
<td>40</td>
<td>90</td>
<td>80</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>States of the World</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product</td>
</tr>
<tr>
<td>----------</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
</tbody>
</table>

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