Critical Thinking and Problem Solving
Critical Reasoning

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Class
1i

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1 Task

Suppose a new team of analysts has reassessed a shale gas deposit based on new evidence and technological improvements. Extraction costs remain the same, but the team now estimates that there are:

- No harm from level C (returns $2 million)
- Only 30% chance of a level B result ($7 million return)
- 40% chance of a level A returns ($12 million return)
- 25% chance of getting level AA results ($24 million return)
- 5% chance of AAA level results ($40 million return)

A rival company called YGN has bid $10 million for the extraction rights. Calculate possible new returns, using a decision tree if that helps you. Then decide which of the following can most reliably be inferred from the data.

A.) On economic grounds alone, the Zenergies should accept YGN's offer

B.) On economic grounds alone, the Zenergies should decline Yangen's offer and continue extraction

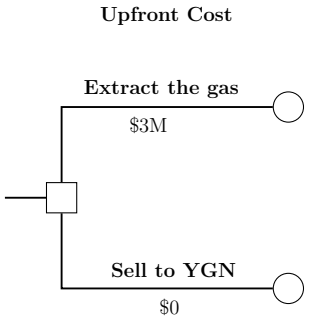
C.) It makes no difference economically which decision the Zenergies make.

Step 1 - Drawing Branches

There are 3 statements that is possible, but there is only one that is most suitable for this situation. First up, the extraction cost is $3 million, so we need to keep that into account when we count the profit.

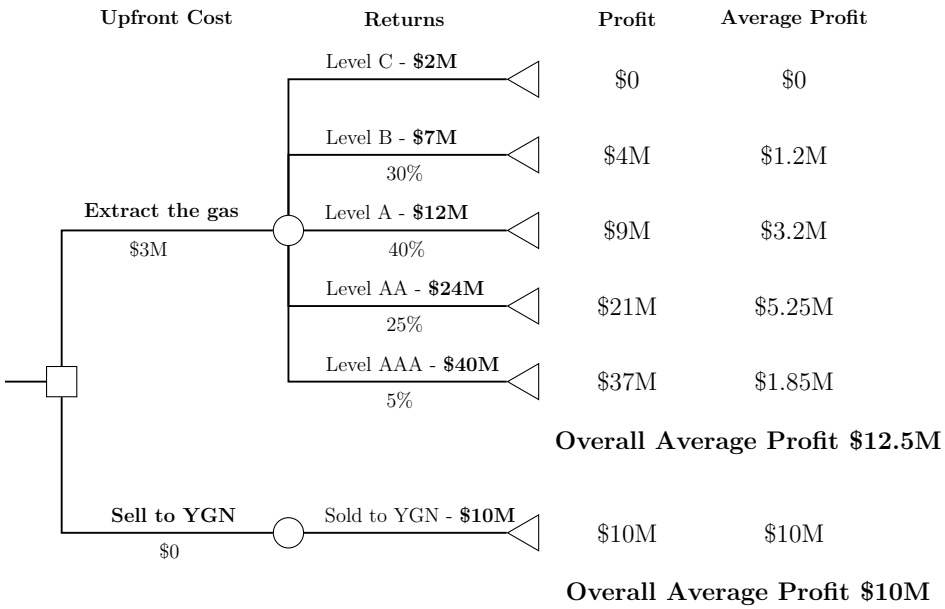
There are 2 paths, though. The first one, a bit risky, but the reward could bemuch higher than the second option, which is we play it safe by selling it to YGN and earn a fixed amount up front.

Also, we need to pay the amount of the extraction cost up front if we go with the first route.



Step 2 - Drawing every possible cases

After knowing those 2 paths, we need to draw every possible branches from them so we can visualise it better. We should also write the profit, average profit, and overall profit to compare it later.



Step 3 - Reading the tree

Based on our decision tree, we can see the overall average profit from both branches. The first one, if we decided to extract the gas and take some risk, we have an overall average profit of $11.5M. If we take the second one, we will get an overall average profit of $10M.

From this information, we can say that the second statement, which says *"On economic grounds alone, the Zenergies should decline Yangen's offer and continue extraction"* is the most reliable statement because we can get $1.5M more by extracting the gas rather than selling it to YGN.