

The Pirate Problem

Five pirates need to divide 100 gold pieces. The pirates have ranks: Captain, First Mate, Second Mate, Third Mate, Fourth Mate. The Captain is the boss; however, as is well known, pirates also believe in some measure of democracy. Hence they adapt the following plan

1. The Captain suggests a way to divide the gold. (For example (40, 10, 10, 10, 30).)
2. The men (including the Captain) all vote (secret ballot) on if they accept this division or not.
3. If OVER half say YES then that is how they divide it. If not, then the Captain is thrown overboard, there are now only 4 left, everyone gets promoted, and they try again. That is, go back to step 1 with the new Captain. Note that now its four people voting so the phrase OVER half means would now mean 3 out of the four.

What is the best way for the Captain to divide the treasure? Fortunately he knows what everyone values. So do we:

1. All pirates prefer being alive to being dead.
2. All pirates prefer more money to less money.
3. All pirates prefer that pirates of higher rank get money if nothing else changes. For example, if the Captain can choose between FIRST MATE GETS 10, SECOND MATE GETS 5 and FIRST MATE GETS 5, SECOND MATE GETS 10, he will choose FIRST MATE GETS 10, SECOND MATE GETS 5
4. All pirates prefer seeing other people die rather than other people live. For example, if one outcome is BLUEBEARD GETS 10 GOLD PIECES AND ZERO PIRATES DIE and another one is BLUEBEARD GETS 10 GOLD PIECES AND ONE PIRATE (NOT BLUEBEARD) DIES, then Bluebeard prefers the one where a pirate dies.

We also assume that Pirates are LOGICAL given these preferences.

SO- how should the Captain divide the gold to both stay alive and get the most gold?