Inheritance division

Participants:

Ages 12 and up, divided into groups of 4-5 people.

Overview:

Heirs want to divide an inheritance consisting of a set of goods, for instance, a house, a car, a canoe, musical instruments, etc. Not all heirs have the same preference, and not all goods have the same value. Is there a way to split them so that each heir feels that they have received an equitable share? We assume that an heir having received more than their share can pay back a sum of money to the other heirs.

Activity

- Start by describing the following method. Each heir prepares a sealed bid, with the monetary value they give to all goods.

  For instance, here are the bids made by Alice, Bob, and Cecilia
  (in thousands of dollars, noted K).

	Alice	Bob	Cecilia
House	360	290	255
Car	21	26	17
Guitar	5	10	6
Canoe	1.5	2	3
Bicycle	2.5	2	4
Total	390	330	285

  The group (for instance each member of the group is an heir) is asked to prepare its list of goods, prepare sealed bids, and make the corresponding table.

- This table tells us that Alice values the totality of goods in 390K. Hence she should value her share in 130K. Similarly, Bob values the totality of goods in 330K; therefore, he should value his share in 110K. Finally, Cecilia values the sum of goods in 285K, so she should value her share in 95K. Determine the corresponding numbers for the list of bids of the group.

- Each good is awarded to the highest bidder. Hence Alice receives the house, Bob gets the car and the guitar, while the canoe and bicycle go to Cecilia. But then, some heirs may have received more than their share while others will have received less.

	Alice	Bob	Cecilia
Value of received goods	360	36	7
Expected share	130	110	95
Difference	230	-74	-88

Build the corresponding table for the group bids.

- Alice will pay the excess value received, 230K, into an account. This money will be used to pay the shortfalls of Bob and Cecilia, and the rest will be distributed equally between the three heirs. Here is the final distribution of the inheritance

Alice	Bob	Cecilia
House	Car	Canoe
	Guitar	Bicycle
22.66K	96.66K	110.66K

Build the corresponding table for the group bids.

- Discuss the distribution method. Is it fair? What is the best strategy for the heirs? Should they bid high for the goods they really want and low for the others? What is the risk of bidding too high or too low for some goods?

- Can you propose other distribution methods? What are their advantages and disadvantages?

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