SOLUTIONS

NOTE: A *Scenario* is a ranked ordering of items for both Alice and Bob with assigned point values that add up to 100. EXAMPLE:

Alice: ISLAND-20,PUPPY-20,JETSKI-20,CAR-10,ELEPHANT-10,HOUSE-17,PICASSO-3

NOTE- Island is worth 20, Puppy is worth 20, etc. The symbol between 'ISLAND' and '20' is a DASH, not a minus sign. If we want a neg number we will write something like ELEPHANT-NEG(10)

Bob: ISLAND-25,JETSKI-30,PUPPY-10,ELEPHANT-10,HOUSE-10,CAR-15,PICASSO-0
is a scenario.

1. (0 points) What is your name? Write it clearly. Staple your HW. When is the first midterm? When is the final? IF YOU CAN"T MAKE THE FIRST MIDTERM (which is at night) LET ME KNOW BY SEPT 17 SO WE CAN MAKE OTHER ARRANGEMENTS.

2. (30 points) There are 9 items to split up between Alice and Bob. They are

   ISLAND,HOUSE,CAR,PICASSO,PUPPY,JETSKI,ELEPHANT,CAT,HAMMER

   Alice and Bob will be doing ABABABABA. Alice and Bob will be assigning POINTS to each item that add up to 100, even though they are NOT doing the AW protocol. Assume they do not know each others preferences and that they both always take the top item that is left according to their own preferences. For the following either give a scenario where it happens OR prove that it can't happen. If you give a scenario describe what happens (e.g., Alice takes th Island, then....)

   Every item is worth between 0 and 30. Alice assigns a DIFFERENT value to each item. Bob assigns a DIFFERENT value to each item. When the allocation is done both Alice and Bob have 100 points worth of goods (in their own minds of course).

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SOLUTION TO PROBLEM 2.

YES this can happen:

ALICE: ISLAND-30,HOUSE-0,CAR-29,PICASSO-0,PUPPY-28,JETSKI-0,ELEPHANT-13,CAT-0,HAMMER-0.

BOB: ISLAND-0,HOUSE-30,CAR-0,PICASSO-29,PUPPY-0,JETSKI-28,ELEPHANT-0,CAT-13,HAMMER-0.

Alice picks ISLAND-30

Bob picks HOUSE-30

Alice picks CAR-29

Bob picks PICASSO-29

Alice picks PUPPY-28

Bob picks JETSKI-28

Alice picks ELEPHANT-13

Bob picks CAT-13

Alice picks HAMMER -0

3. (30 points) Assume that Alice and Bob's scenarios each give each item a value between 3 and 20. Find a scenario such that if they do ABABABABA and the following happens:

They both get a very large amount, over 60. They need not both get the same. Try to get them as much as possible.

SOLUTION TO PROBLEM 3.

ALICE: ISLAND-20,HOUSE-3, CAR-19,PICASSO-4, PUPPY-18,JETSKI-5, ELEPHANT-17,CAT-6,HAMMER-6

BOB: ISLAND-3,HOUSE-20, CAR-4,PICASSO-19, PUPPY-5,JETSKI-18, ELEPHANT-6,CAT-17, HAMMER-6.

Alice picks ISLAND-20

Bob picks HOUSE-20

Alice picks CAR-19

Bob picks PICASSO-19

Alice picks PUPPY-18

Bob picks JETSKI-18

Alice picks ELEPHANT-17

Bob picks CAT-17

Alice picks HAMMER -6

Alice gets: 80

Bob gets: 74

4. (40 points) Assume that the points are as follows:

   ALICE: ISLAND-20,HOUSE-10, CAR-25,PICASSO-5, PUPPY-20,JETSKI-15, ELEPHANT- NEG(10) ,CAT-5,HAMMER-10

   BOB: ISLAND-30,HOUSE-20,CAR-5,PICASSO-10,PUPPY-5,JETSKI-20, ELEPHANT-NEG(5),CAT-10,HAMMER-5.

   NOTE- NEG(x) means that its worth $-x$.)

   (a) Do AW and report how it comes out. Assume all items are fluid except the Elephant and the Puppy.

   (b) Assume Alice knows Bob's point values. Have Alice lie about her point values to get MORE. Compare what she gets honestly to what she gets dishonestly. (She should get MORE for being dishonest, but I honestly don't know how much more, unless I am being dishonest with you!)

5. (Extra Credit- in fact, I don't know how to do it) Find the MOST Alice can get and PROVE it. (NOTE- Extra credit is graded by Dr. Gasarch. It is NOT for extra grade-points, its for a letter he might write for you one day. *I was impressed with how student John Smith helped fictional Alice cheat as much as possible.*