HW 1 HONR 209M. Morally DUE Tuesday Sep 10

SOLUTIONS

NOTE: A *Scenario* is a ranked ordering of items for both Alice and Bob. For example
Alice: ISLAND,PUPPY,JETSKI,CAR,ELEPHANT,HOUSE,PICASSO
Bob: ISLAND,JETSKI,PUPPY,ELEPHANT,HOUSE,CAR,PICASSO
is a scenario (the lists are both best-to-worst)

NOTE: A *preference list* is one ot the above lists. For example Bob's preference list is
ISLAND,JETSKI,PUPPY,ELEPHANT,HOUSE,CAR,PICASSO

1. (0 points) What is your name? Write it clearly. Staple your HW. When is the first midterm? When is the final? RESPOND to the email I send the class asking IS THIS YOUR CORRECT EMAIL ADDRESS in case you haven't' already.

2. (50 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. 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 each of the following either give a scenario where it happens OR prove that it cannot happen.

   (a) Alice gets her top five choices and Bob gets his top four choices. (So both do well.) Explain your answer.

   (b) Alice gets her top five choices and Bob gets his bottom four choices (So Alice does better than Bob.) Explain your answer.

   SOLUTION TO PROBLEM 2.

   a)

   YES this can happen:

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

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

Alice picks ISLAND(1)

Bob picks JETSKI (1)

Alice picks HOUSE (2)

Bob picks ELEPHANT (2)

Alice picks CAR (3)

Bob picks CAT (3)

Alice picks PICASSO (4)

Bob picks HAMMER (4)

Alice picks PUPPY (5).

b) This cannot happen. Since Alice goes and the Bob goes Bob will certainly get his first or second favorite item.

3. (50 points) Same items as in Problem 2, and same protocol: ABABABABA Give a scenario where if Bob knows Alice's preference list he does very well. Give both what happens if they do not know each others lists, and what happens if Bob knows Alice's list.

   SOLUTION TO PROBLEM 3.

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

   BOB: HOUSE, CAT, ISLAND, HAMMER, ELEPHANT, JETSKI, PUPPY, PICASSO, CAT

   NORMAL SCENARIO:

   Alice picks ISLAND (1)

   Bob picks HOUSE (1)

   Alice picks CAT (2)

   Bob picks HAMMER (4)

   Alice picks CAR (5)

   Bob picks ELEPHANT (5)

Alice picks PICASSO (6)

Bob picks JETSKI (6)

Alice picks PUPPY (7)

BOB GETS: 1,4,5,6

BOB KNOWS:

Alice picks ISLAND (1)

Bob picks CAT (2)

Alice picks HAMMER (3)

Bob picks HOUSE (1)

Alice picks CAR (5)

Bob picks JETSKI (6)

Alice picks PICASSO (6)

Bob picks ELEPHANT (5)

Alice picks PUPPY (7)

BOB GETS: 1,2,5,6

Clearly Bob does better when he knows what Alice wants.