

HW 1 HONR 209M. Morally DUE Tuesday Feb 3
WARNING- THE HW IS TWO PAGES LONG

NOTE: A *Scenario* is a ranked ordering of items for both Alice and Bob. For example

Alice: MP3s,CATS,AIRPLANE,SOFA,IPAD,BDS,PAINTING
(BDS is Bob Dylan Satires)

Bob: MP3s,AIRPLANE,CATS,IPAD,BDS,SOFA,PAINTING
is a scenario (the lists are both best-to-worst)

NOTE: A *preference list* is an ordering of the seven items, as above.

For all problems in this problem set we assume Alice and Bob are splitting these seven items. They are all discrete. (e.g., Cats are pets not meat! You really DO NOT want to break a Picasso Painting in half!)

1. (0 points) What is your name? Write it clearly. Staple your HW. When is the midterm? When is the final?

2. (30 points) 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 four choices and Bob gets his top three choices. (So both do well.) Explain your answer.
 - (b) Alice gets her top four choices and Bob gets his bottom three choices (So Alice does MUCH better than Bob.) Explain your answer.

3. (30 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.

4. (40 points) For each of the following either give a scenario where it happens OR show that it CANNOT happen.

- (a) Alice does better with ABBAABB than with ABABABB
- (b) Bob does better with ABBAABB than with ABABABB
- (c) (EXTRA CREDIT- HAND IN SEP SINCE DR. GASARCH WILL GRADE) BOTH do better with ABBAABB than with ABABABB

(NOTE- better has to be unambiguous. That is (1,3,4) is BETTER than (2,4,6) but its not clear how (1,4,5) compares to (2,3,6).)

(NOTE- Extra credit does NOT affect your grade but it affects a letter I might write for you at some later point.)