HW 8 HONR 209M. Morally DUE Tuesday Nov 19

SOLUTIONS

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

2. (50 points) Assume that there IS a discrete 10-cut protocol so that THREE people can produce FIVE pieces, each worth 1/5 in ALL of their eyes. USE this to produce an envy-free 5-person discrete protocol with a bounded number of cuts. How many cuts does it use? Give the protocol and the advice. For each person show that if they DO NOT FOLLOW the advice they could get $< 1/5$. For each person show that if they DO FOLLOW the advice they cannot envy anyone.

   SOLUTION TO PROBLEM 2.

   The players are $A, B, C, D,$.

   (a) A, B, C apply the protocol to the pie to obtain FIVE pieces that they all think are worth 1/5. Note that this take 10 cuts. (They execute that protocol correctly.)

   (b) D trims at most one piece (to create a tie). The usual caveat- if ever D has to take a piece and the trimmed piece is available then he must takes it. The trim is set aside.

   (c) E picks (so he's happy he went first), D picks (so he's happy since he created a tie), C, B, A pick (they are happy since they think all non-trimmed pieces are worth 1/5.)

   (d) COMMENT not an action: Remaining trim is T. Assume D got the trimmed piece. If D gets ANY of T, A, B, C don't care since they all think D got ripped off anyway.

   (e) A, B, D apply the protocol to T obtain FIVE pieces that they all think are worth 1/5. Note that this take 10 cuts. (They execute that protocol correctly.)

   (f) E picks (he's happy, he went first), C picks (KEY- he's happy since he doesn't care what E gets), A, B, D pick (they are happy since they think all the pieces are 1/5).

3. (50 points) Say the cheescake protocol is done with 10 people for a cake with 5 dierent pieces. Give a scenario where this works REALLY WELL. Give a scenario where this works REALLY BADLY.

SOLUTION OMITTED