

HW 7 HONR 209M. Morally DUE Tuesday Mar 24

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, Bob, and Carol will do the COME LATE protocol with Alice and Bob being the first at the party and Carol coming later.
 - (a) Give a scenario where Alice knows Carol's preferences and uses this to get MORE THAN $1/3$.
 - (b) Give a scenario where everyone is honest and nobody knows the others preferences and yet Carol envies Alice.
3. (30 points) Alice, Bob, Carol, and Donna do the TRIM protocol. Assume that
 - Alice cuts a piece which Donna gets,
 - then Bob cuts a piece which Bob gets,
 - then Carol cuts a piece which Alice gets
 - then Carol just gets the rest.
 - (a) For which pairs of people (Person1,Person2) is it possible that Person1 envies Person2? For one of the pairs, prove it.
 - (b) For which pairs of people (Person1,Person2) is it NOT possible that Person1 envies Person2? For one of the pairs, prove it.
4. (30 points) Alice and Bob and Carol want to split a cake in ratio $(1 : 3 : 5)$.
 - (a) Give a protocol for this problem. How many cuts did it take?
 - (b) Generalize to give a protocol for any $(a : b : c)$. How many cuts does it take?