CS 70   ## 130 LECTURE 4

STABLE MATCHING

We want to match candidates to internships.
We have n jobs & n candidates. We care about preference.

Jobs			
1	A	B	C
2	B	C	A
3	C	A	B

Candidates			
A	2	3	1
B	3	1	2
C	1	2	3

There are 6 possible matchings. Which ones are reasonable?

a) <u>Perfect Matching</u> : when jobs & candidates have aligned ranks

b) <u>Fierce Competition</u> : when jobs/candidates have identical ranks
intuition is harder here, but results = a).

<u>Stability</u> is defined as the lack of rogue couples, which
would rather be together than current partners

Are there always stable matches? Can you find them? Are they
unique? Are there "better" or "worse" matches? For whom? Do we care?

ROOMMATES

A: B C D
B: C A D
C: A B D
D: doesn't matter

(A,B) (C,D) △   BC is rogue
(A,D) (B,C) □   AC is rogue
(A,C) (B,D) ☆   AB is rogue

Perpetual Drama Machine

PROPOSE & REJECT

Discrete Time: morning, afternoon, evening
M: each job can make offer to best unrejected candidate
A: all offers sent, all candidates reject worse offers
E: all jobs cross off rejected candidates (bookkeeping)
If no rejections, stop. Everyone takes offer in hand.