

Algorithm

Sort C so that the C 's with earliest last meeting are paired 1st

If there's a C that starts later than C' finishes

C is paired with its earliest E

while there exists a free E

E meets with C

if E has not been paired yet

(C, E) get paired

else (C, E') are paired

if C prefers E' to E

E remains free

else

(C, E) get paired and E' is free

* prefers can be defined as "has the latest available meeting with"

Proof:

Suppose we have a schedule where a C finishes before C' starts, by pairing C with its first E , C cannot be stood up.

Then by ordering the C 's we are able to pair C 's in such a way that the C 's who ~~finish first~~ have the earliest last meeting get paired first. So now for any C who finishes after, they cannot be paired with that E . As the ~~set~~ # of pairs increase the possible pairs for C' diminish. Knowing that no E' can meet with 2 C 's at any time, we can see that the meeting between C' and E' is in a unique time slot.

If C' and E' meet before C' is supposed to meet any other E'' then there is no conflict and C' is not stood up.

If C' and E' meet after C' is supposed to meet any E then C' gets stood up. But knowing that E has already been paired with another C ~~meaning that~~ in an earlier time slot than E is not available to C' , so C' must meet E' before C' meets with any other E 's that might stand C' up.

Analysis:

Sort C $O(n^2)$
If $C_{start} > C'_{first}$ $O(n)$
 C is paired with ~~min~~ C 's first E
while there exists a free E $O(n^2)$
 E meets with C $O(1)$
 if C has not been paired yet
 (C, E) get paired
 else (C, E') are paired
 if C prefers E' to E
 E remains free
 else
 (C, E) get paired and E' is free $O(1)$

Sorting takes $O(n^2)$ bc we check each C
and ~~then~~ check the time slots in C

Comparing $C_s > C'_f$ is $O(n^2)$ because we
check each C and the last time slot in each C

Pairing E to C takes $O(n^2)$ bc we need
to pair each E to a C

- use a loop to go through E 's and a nested loop for C 's