

The Match:

Strong Medicine for New Doctors



By

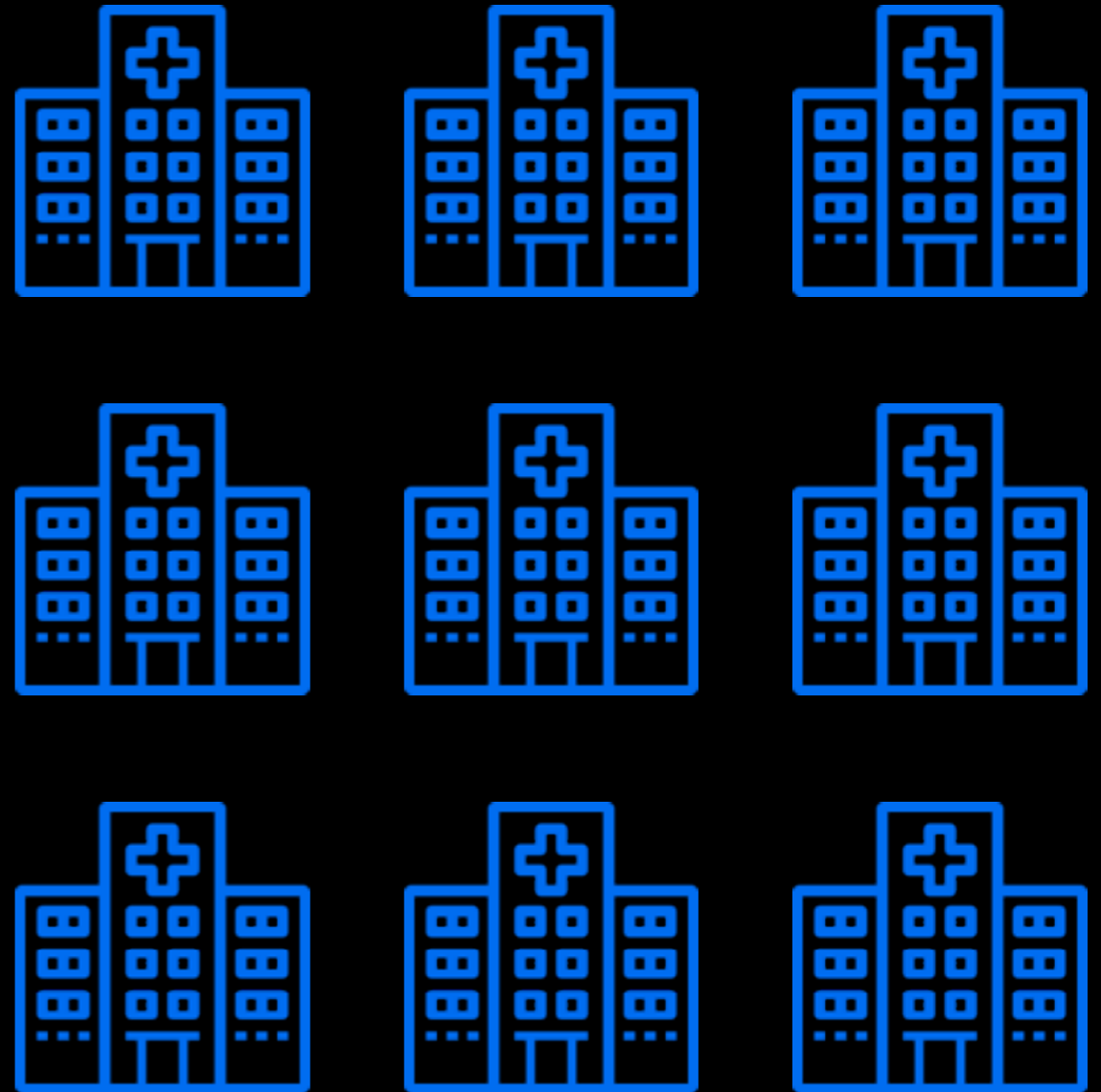
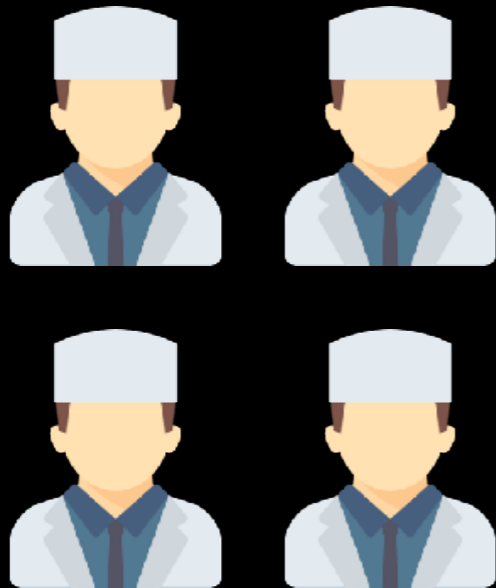
Trudie
Hung-Yi Chen

What will you learn in this lecture

- **A story about matching new doctors and hospitals.**
- **The problems they met and how to fix it.**
- **Ours insight about this case.**

Origin from the first job of medical school graduates...

Story before matching



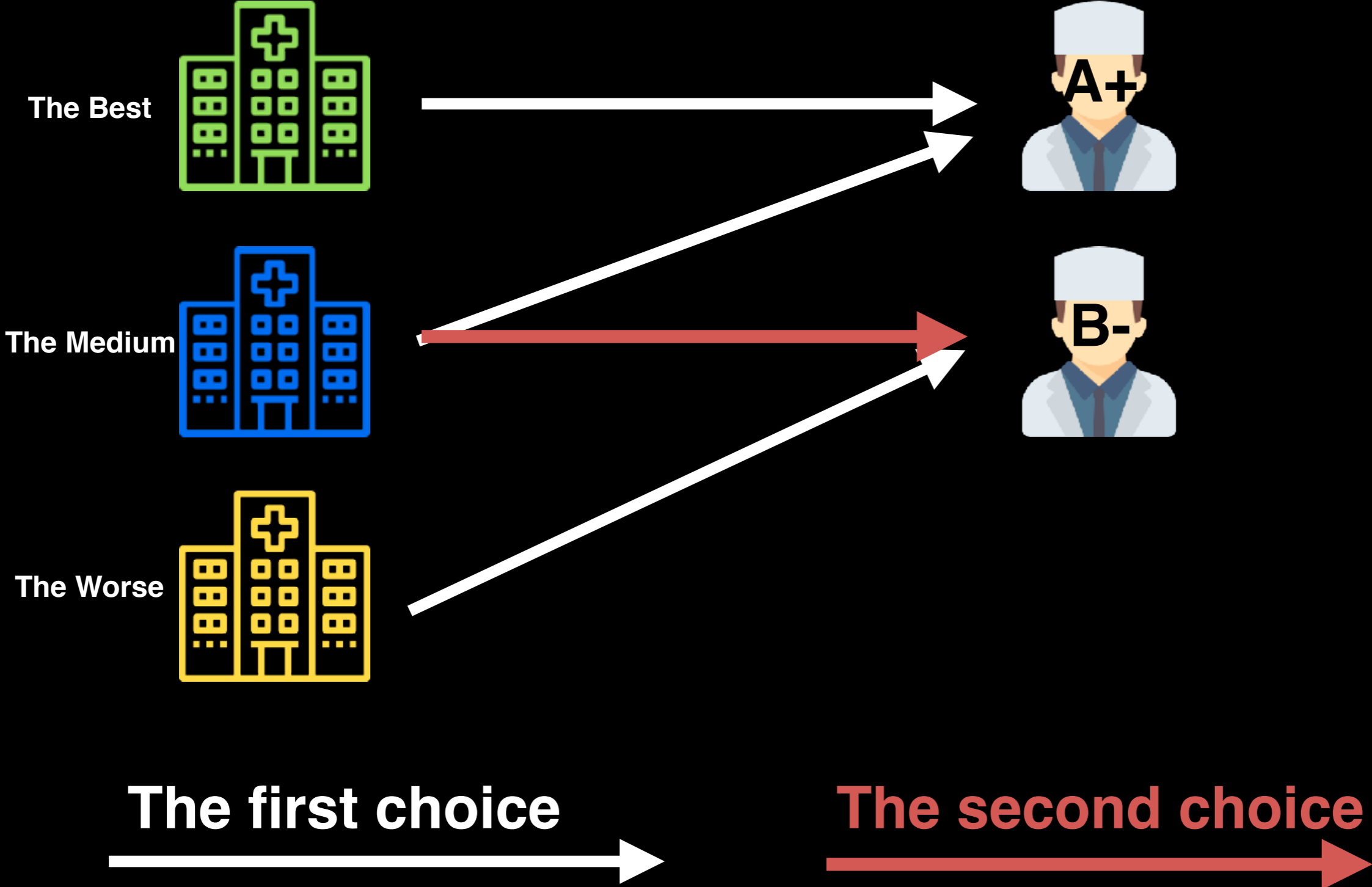
The problem of matching

To compete for scarce medical school graduates, hospitals began to try to hire interns earlier, almost two years before graduation.

How they fix it

- **A third party involved — medical schools**
- **Not to release information about students before a specified day.**

Matching Process



Matching Problems



16+ working hours
for old doctor.






The wrong first offer put them out of the game.

HOW TO FIX IT?






The Clearinghouse stand out to solve the problem.



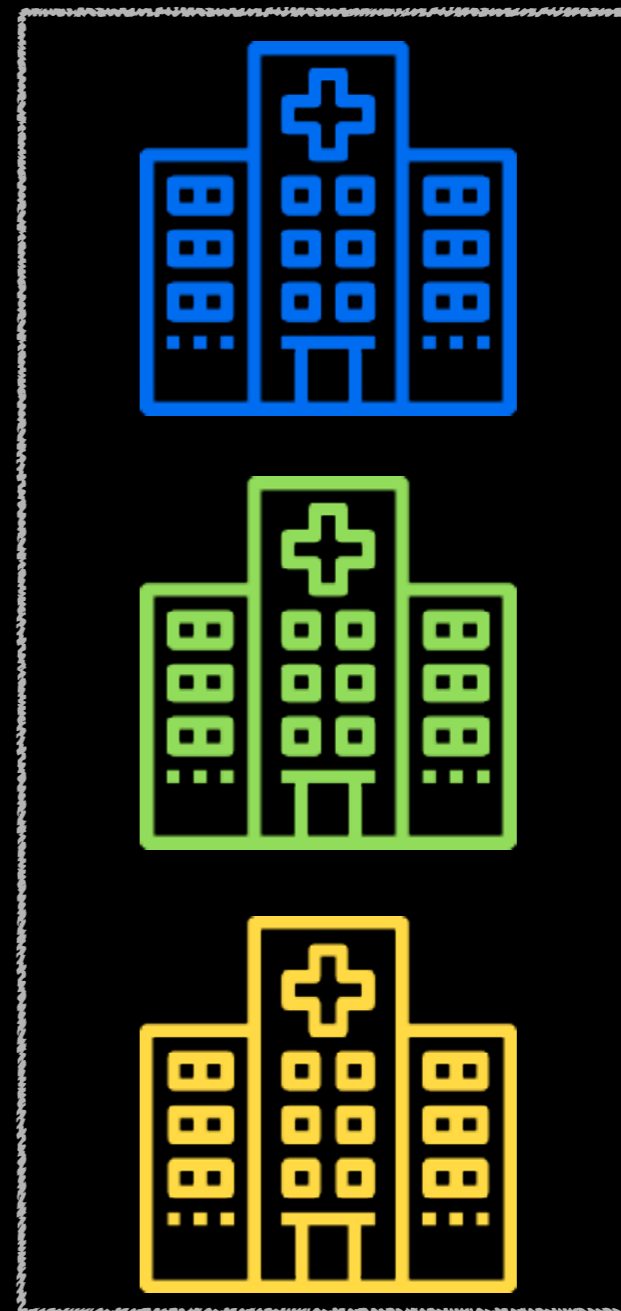
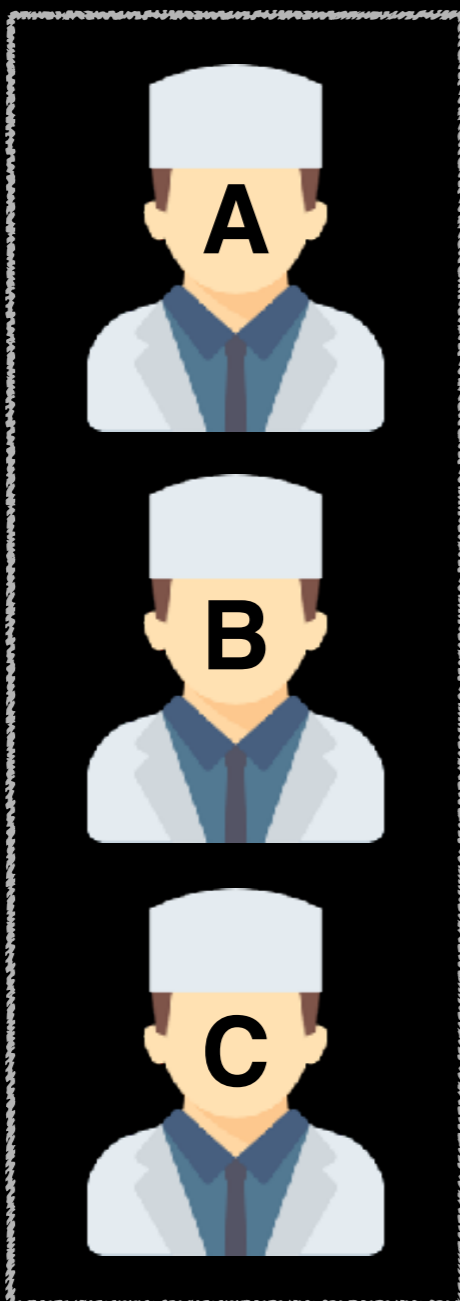
1. 
2. 
3. 



1. 
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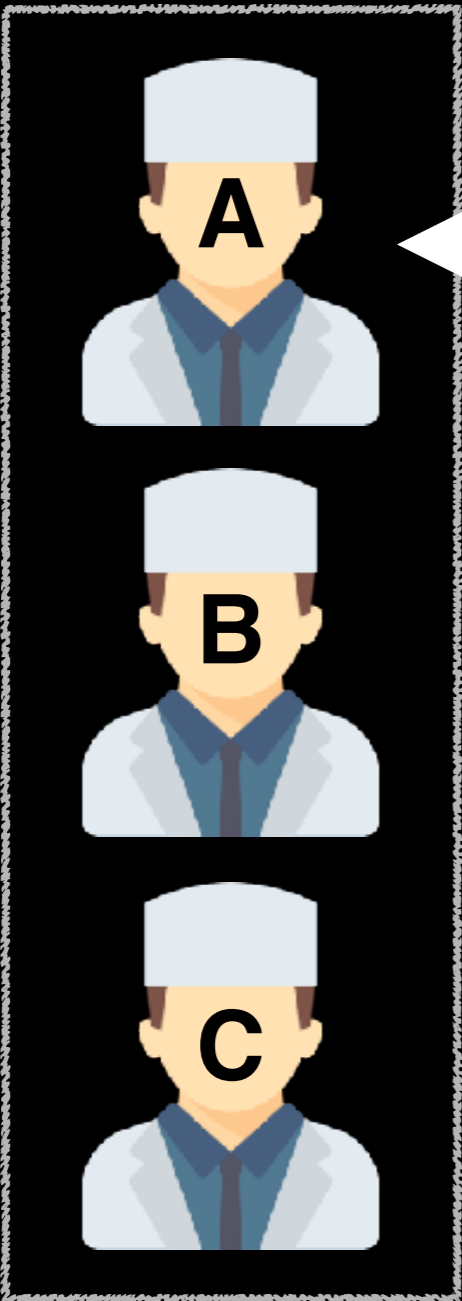


Explanation

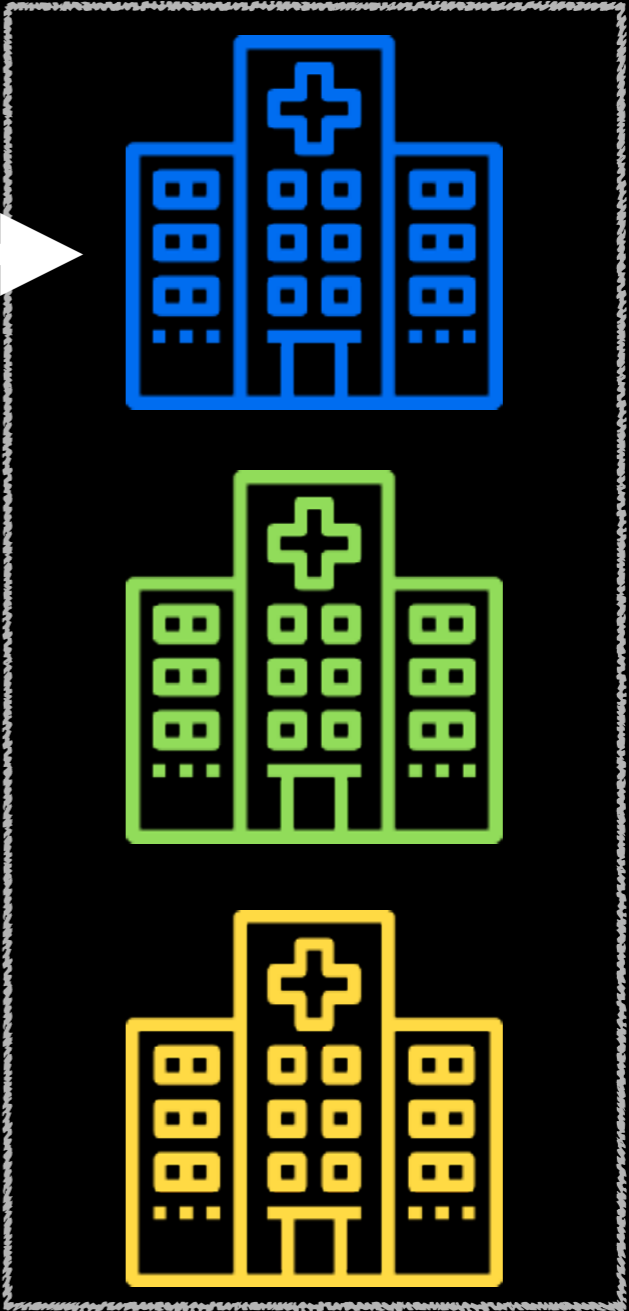


First Round

(1-1)



YA



Second Round

(2-1)



He have get
an offer already.

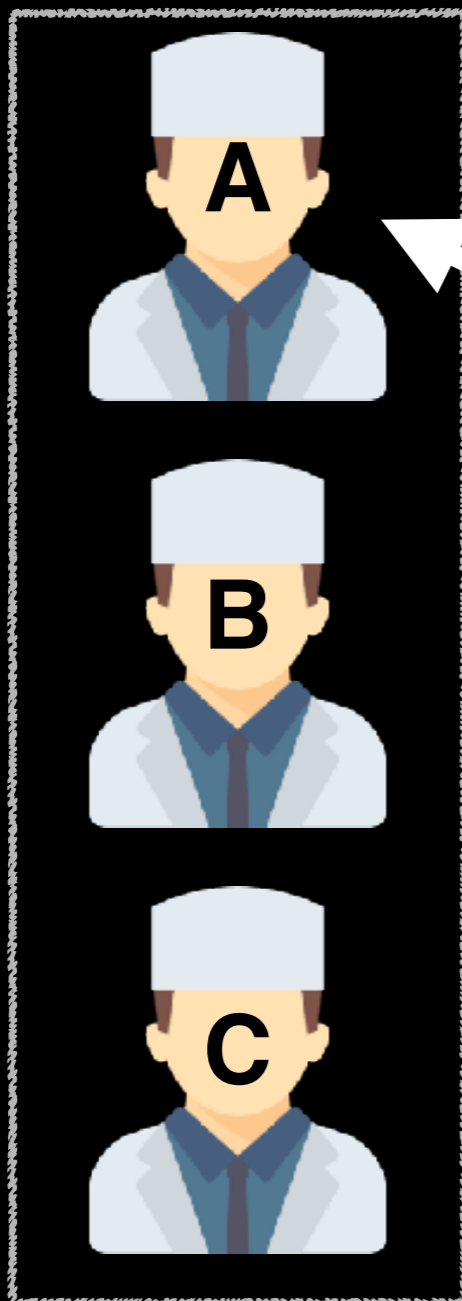


YA

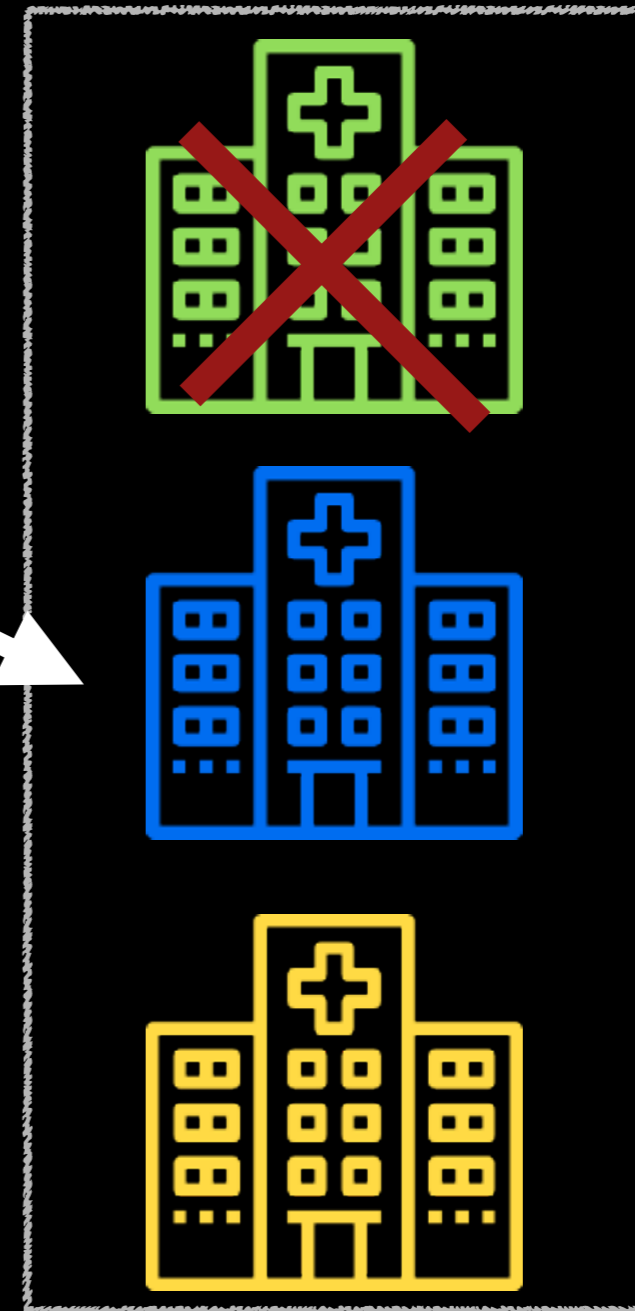


Third Round

(1-2)



YA



Full of
intern

Fourth Round

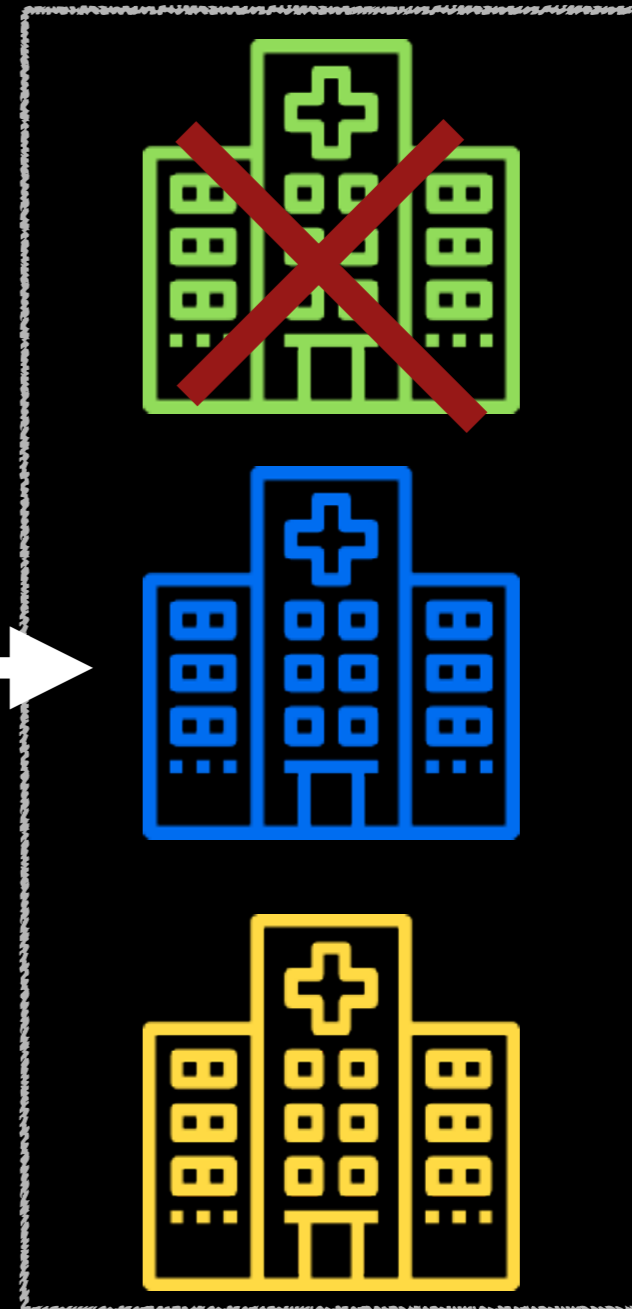
(2-2)



He have get
an offer already.



YA



Full of
intern

Looks perfect, but...

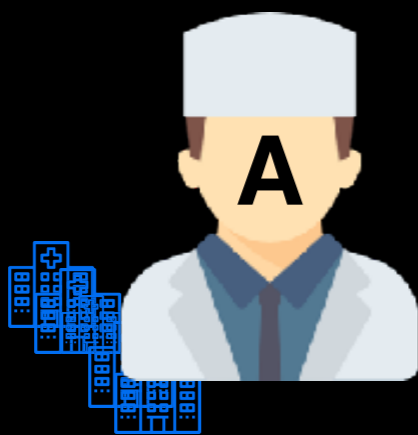


Hardy Hendren :

**There is a flaw
in the proposed design.**

The flaw

Student realized it wasn't safe to confide their true preference.



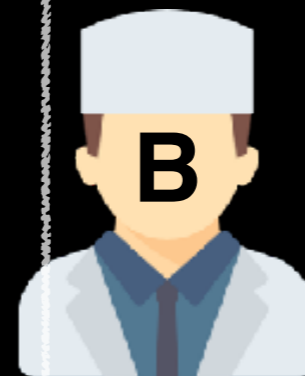
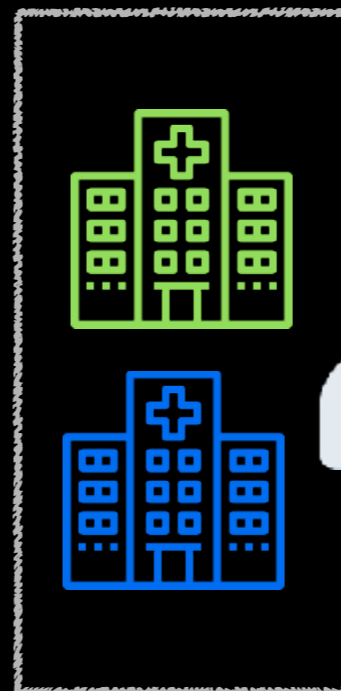
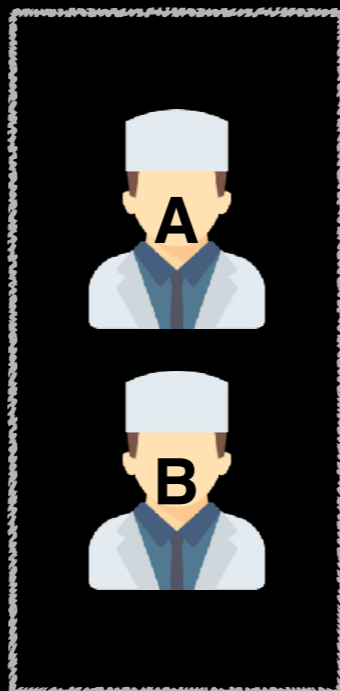
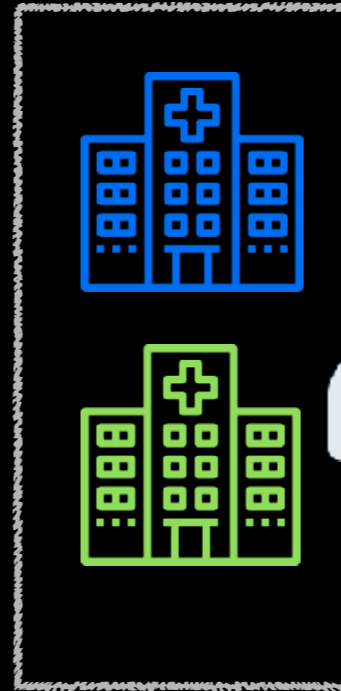
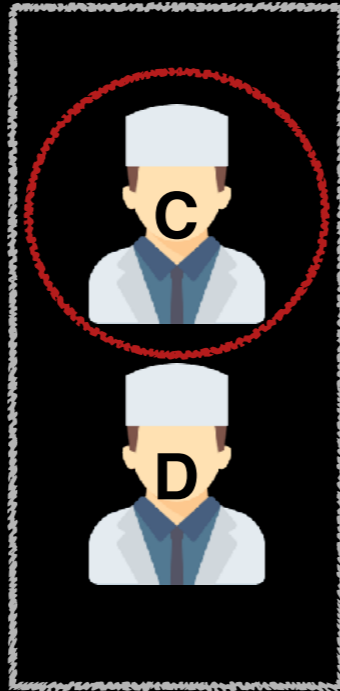
A is a great student



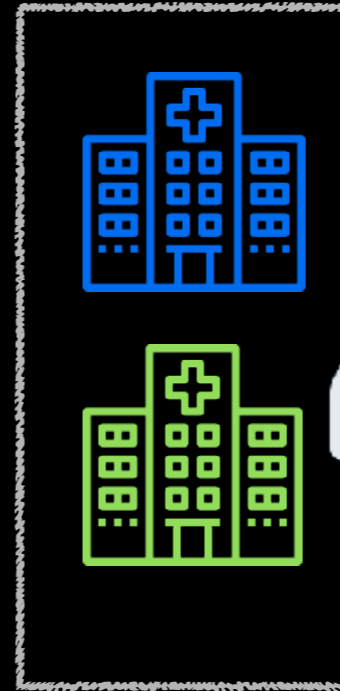
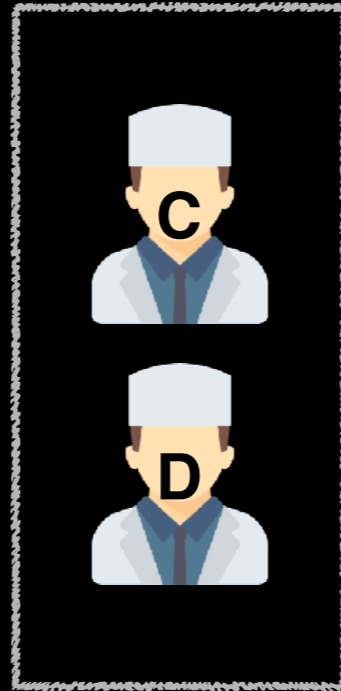
Blue and green hospital are very popular

The flaw

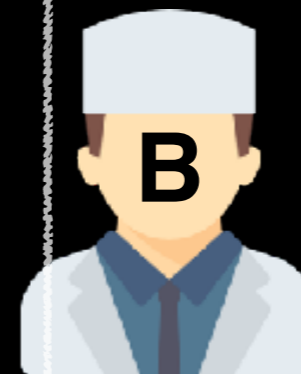
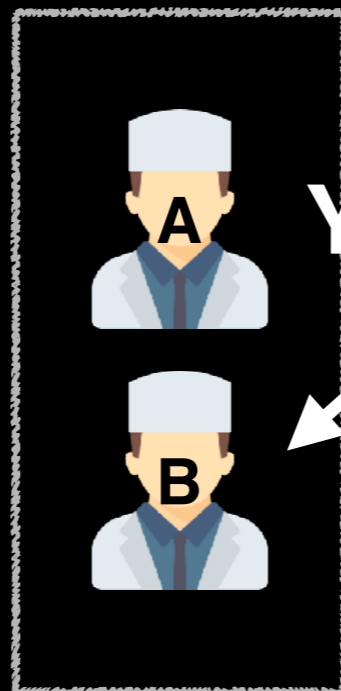
At the 1-1, full of intern



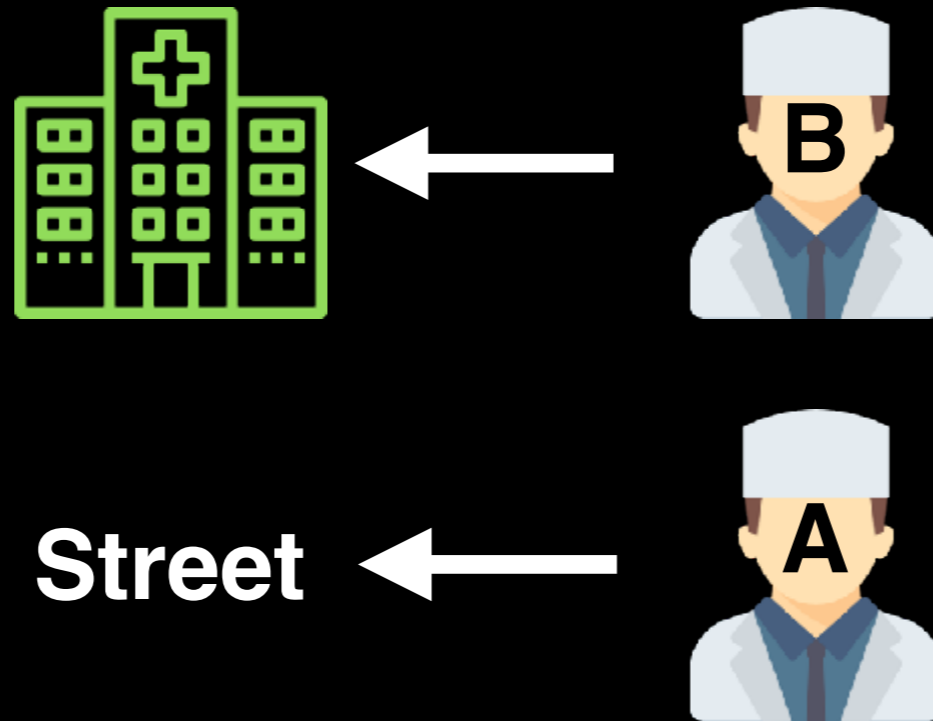
The flaw



At the 2-1, full of intern



Matching Result



**A lose green hospital
but B got it**

HOW TO FIX IT?

New algorithm

step0 : submit preference



clearing house

New algorithm

step 1



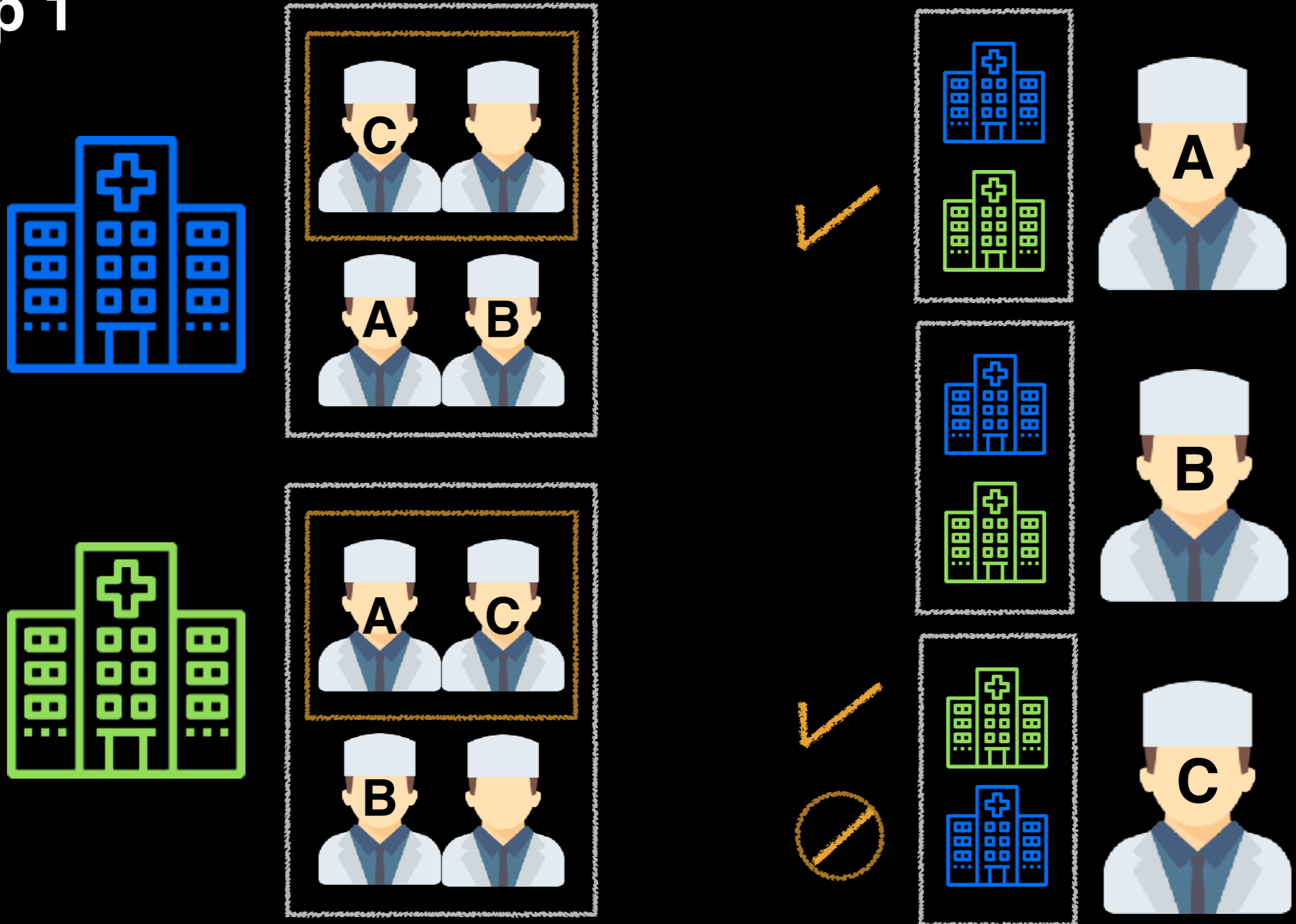
**Offer jobs to its
top-choice
candidates**



**accept the best one
he received
(tentatively)
reject others**

New algorithm

step 1

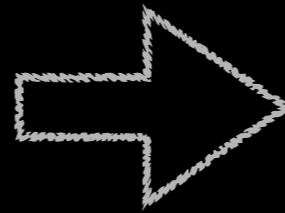


New algorithm

step n



**Offer jobs
to its next
choice**

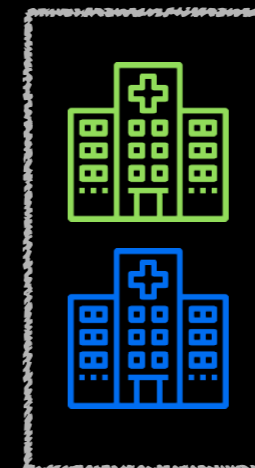
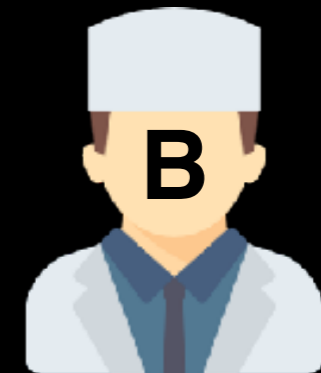
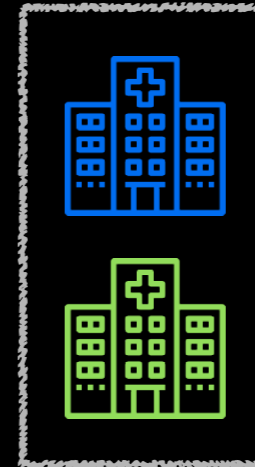
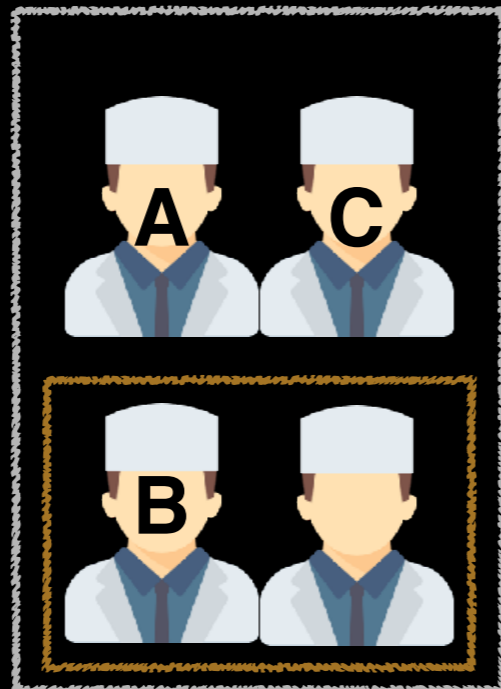
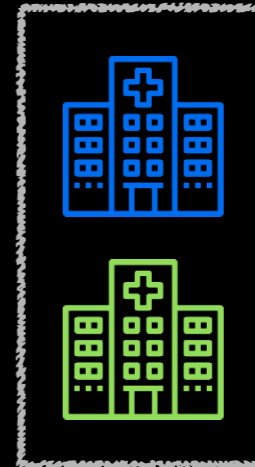
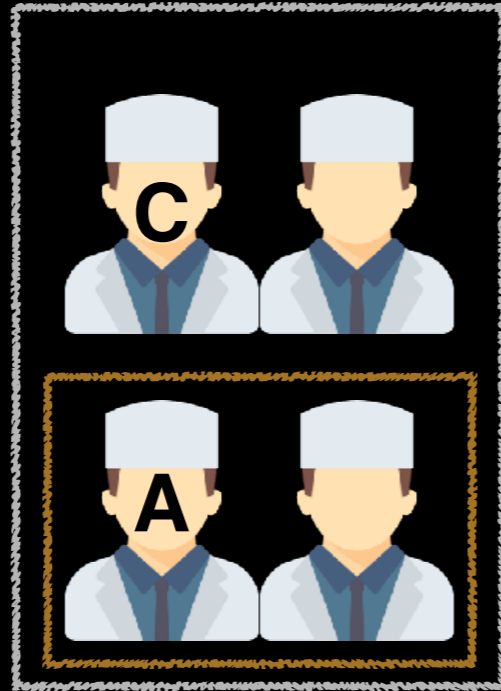


**accept the best one
(tentatively)**

**reject others
(include the
previously
accepted one)**

New algorithm

step 2



New algorithm

end



**no offer
is rejected**

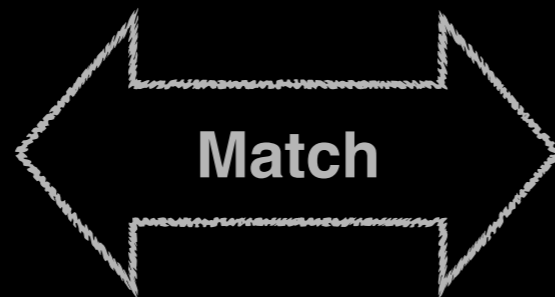


**accept offer he had
most recently accepted**

New algorithm

The final matching is always stable

simple logic :



**if he prefer Blue than Green,
Blue never offer him,
or he will rejected Green**



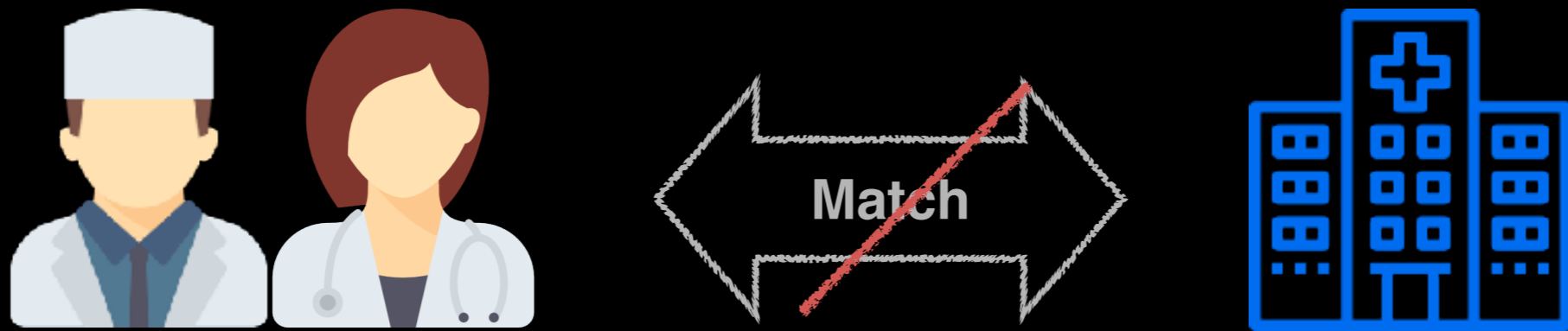
Blue has filled up with candidates it preferred to A

**Again,
Looks perfect, but...**



**There is a flaw
in the proposed design.**

Couple change the match



women started to enter medical school in significant numbers

married couples appeared and they need to live together

decline the offers suggested by the match

Couple change the match



leading member

one go through match first



the other's preference list would be edited to include only jobs in the same city

“you can't be happier than your spouse”

HOW TO FIX IT?

Couple change the match

revised step 1



Offer jobs to its top-choice candidates



start with the one they preferred most

Almost always possible to find a stable matching.

Conclusion

- **Centralize market fixed the early apply problem.**
 - It asked decisions in advance and finding the result quickly.
- **Stable match is the key of successful of the market.**
 - It was attractive for doctors and hospital.
- **The steps of match are important in match problem.**
 - It make it safe for doctors confide their true preference.
 - It solve the couple problem.

Discussion

- **It's hard for rural hospitals hired young students.**
 - Paid and future career are factors of the preference of students.
 - It's cheaper to hire the old doctors.
- **Control the market by hiding true preference.**
 - Incentive compatibility, Hurwicz et al. (2006, Nobel Prize in economics)
- **Can students list their choice as many as they want?**
- **Can student rejected the result that algorithm stopped by?**

Q&A