

1 Deferred Acceptance Algorithm

Which of the following are possible in a stable matching instance with n doctors and n hospitals.

In the deferred acceptance algorithm, a doctor might get matched with the same hospital twice.

- Possible
- Impossible

Correct

In the deferred acceptance algorithm, a doctor might get matched to all the n hospitals at least once.

- Possible
- Impossible

Correct

A doctor-optimal matching might be a hospital-optimal matching as well.

- Possible
- Impossible

Correct

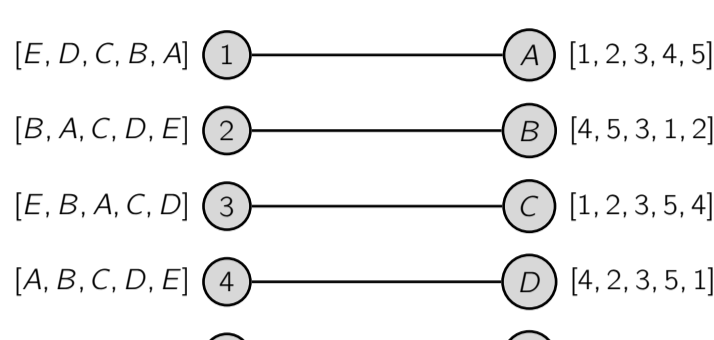
There might be a setting of hospitals' and doctors' preferences where no stable matching exists.

- Possible
- Impossible

Correct

2 Stable Matching Example

Consider the following graph where A, B, C, D, E are doctors and $1, 2, 3, 4, 5$ are hospitals. The preferences are listed next to each node from most preferred on the left to the least preferred on the right.



How many blocking pairs are there in the given matching?

Correct

What is the doctor optimal matching?

A's match:

Correct

B's match:

Correct

C's match:

Correct

D's match:

Correct

E's match:

Correct

What is the hospital optimal matching?

A's match:

Correct

B's match:

Correct

C's match:

Correct

D's match:

Correct

E's match:

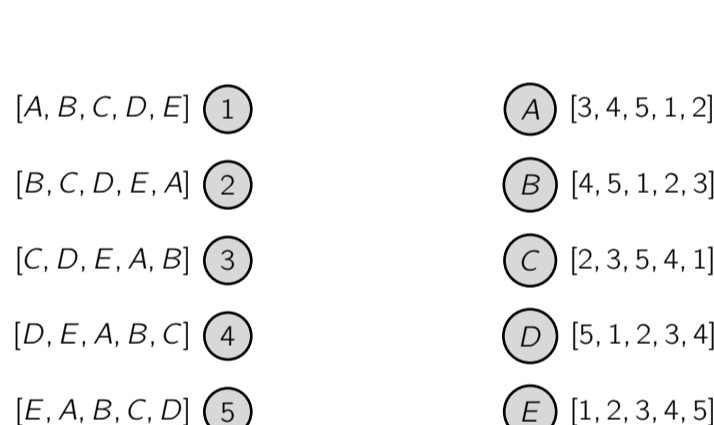
Correct

Are there other stable matchings (different from what we've found) in this example?

- Yes
- No

Correct

Now consider the following example (no matching specified). Similar to the last example A, B, C, D, E are doctors and $1, 2, 3, 4, 5$ are hospitals.



What is the doctor optimal matching?

A's match:

Correct

B's match:

Correct

C's match:

Correct

D's match:

Correct

E's match:

Correct

What is the hospital optimal matching?

A's match:

Correct

B's match:

Correct

C's match:

Correct

D's match:

Correct

E's match:

Correct

Are there other stable matchings (different from what we've found) in this example?

- Yes
- No

Correct

3 Number of Stable Matchings

Is there a polynomial-time algorithm that receives the list of preferences of doctors and hospitals and determines if the stable matching is *unique* or if there are multiple stable matchings?

- Yes
- No

Correct

Suppose that there are two states who want to run a joint doctor-hospital matching program. The first state has n hospitals and n doctors, and the second state has m hospitals and m doctors. Every doctor prefers all the in-state hospitals to all the out-of-state hospitals, and similarly every hospital prefers in-state doctors to out-of-state doctors.

Could there be a stable matching where a hospital and doctor from different states are matched?

- Yes
- No

Correct

Suppose that in this two-state program, the doctor-optimal and hospital-optimal stable matchings are completely disjoint (no doctor-hospital pair is common between the two). What can be the total number of stable matchings that exist?

- 2
- 3
- 11
- None of the above.

Correct