



Stability and Marriage Problems

 Files	
 Link	
 Status	Done
 Type	Lecture

Finding a matching

An algorithm for matching. Produces a stable matching (not possible for one of the sides to leave the current partner for a better one), the matching is better for the party that is proposing.

This video explains the procedure https://www.youtube.com/watch?v=0m_YW1zVs-Q but it is not exactly how Frank wants you to do it. Frank wants the numbers written in a very specific way so grading is easy and you can see those in the examples below. So try to stick to that.

Also another difference between the video and Frank is that Frank goes back to already matched individuals that lost their matching in a subsequent step. While in the video, he does them all, then goes back to ones that do not have a matching anymore.

Example 1

	1	2	3	4
A:	F	K	G	L
B:	G	K	F	L
C:	L	G	F	K
D:	L	F	G	K
E:	K	G	L	F

and

	1	2	3	4	5
F:	C	B	A	E	D
G:	D	A	B	E	C
K:	E	C	A	D	B
L:	E	A	B	C	D

	1	2	3	4
A:	F ¹	K ¹⁰	G ¹¹	L ¹²
B:	G ²	K ⁷	F ⁹	L ¹⁵
C:	L ³	G ¹³	F ¹⁴	K
D:	L ⁴	F ⁵	G ⁶	K
E:	K ⁸	G	L	F

and

	1	2	3	4	5
F:	C ¹⁴	B ⁹	A ¹	E	D ⁵
G:	D ⁶	A ¹¹	B ²	E	C ¹³
K:	E ⁸	C	A ¹⁰	D	B ⁷
L:	E	A ¹²	B ¹⁵	C ³	D ⁴

(A, L)
(B, -)
(C, F)
(D, G)
(E, K)

Example 2

	1	2	3	4
A:	F			
B:	G	K	F	L
C:	L	G		
D:	L	F	G	K
E:	K	G		

and

	1	2	3	4	5
F:	C	B	A	E	D
G:	D	A	B		
K:	E	C			
L:	E	A	B		

able propose:

	1	2	3	4
A:	F	1		
B:	G	2	8	L
C:	3	4	9	
D:	5	6	7	K
E:	10	G		

and

	1	2	3	4	5
F:	C	9	1	E	6
G:	2	A	2	4	
K:	10	C	8		
L:	E	A	B	3	5

Example 3

Here there is a small mistake where I skipped 4 and went directly to 5... just subtract one from all the numbers equal or above 5

	1	2	3	4	5
Anny:	Freddy ¹	Harry	Kenny	Gerry	Lenny
Betty:	Gerry ²	Kenny ⁹	Freddy	Harry	Lenny
Conny:	Lenny ³	Harry	Gerry	Freddy	Kenny
Dolly:	Harry ⁴	Lenny ⁶	Freddy ⁷	Gerry ⁸	Kenny
Emmy:	Harry ⁵	Kenny	Gerry	Lenny	Freddy

	1	2	3	4	5
Freddy:	Conny	Betty	Anny ¹	Emmy	Dolly ⁷
Gerry:	Dolly ⁸	Anny	Betty ²	Emmy	Conny
Harry:	Emmy ⁵	Anny	Dolly ⁴	Betty	Conny
Kenny:	Emmy	Conny	Anny	Dolly	Betty ⁹
Lenny:	Emmy	Anny	Betty	Conny ³	Dolly ⁶

	1	2	3	4	5
Anny:	Freddy ¹	Harry	Kenny ⁷	Gerry	Lenny ⁹
Betty:	Gerry ²	Kenny ⁹	Freddy	Harry	Lenny ¹⁰
Conny:	Lenny ³	Harry	Gerry	Freddy ¹	Kenny ⁶
Dolly:	Harry ⁴	Lenny ⁶	Freddy ⁷	Gerry ⁸	Kenny
Emmy:	Harry ³	Kenny ⁵	Gerry	Lenny ⁸	Freddy

	1	2	3	4	5
Freddy:	Conny ¹	Betty	Anny ¹	Emmy	Dolly ⁷
Gerry:	Dolly ²	Anny	Betty ²	Emmy	Conny
Harry:	Emmy ³	Anny	Dolly ⁴	Betty	Conny
Kenny:	Emmy ⁵	Conny ⁶	Anny ⁷	Dolly	Betty ⁹
Lenny:	Emmy ⁸	Anny ⁹	Betty ¹⁰	Conny ³	Dolly ⁶