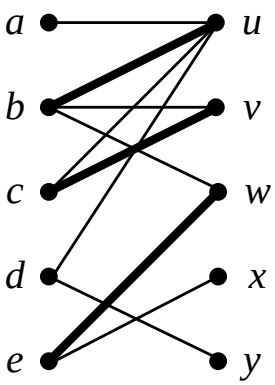
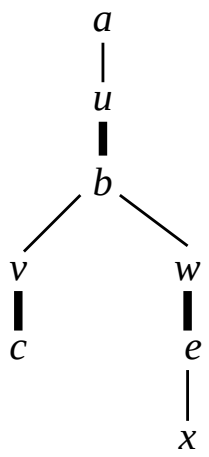
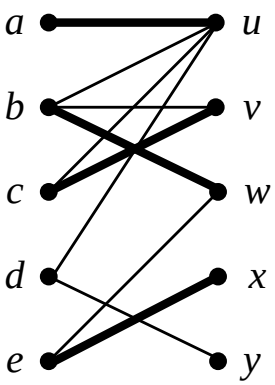


(a) A matching



(b) The alternating tree



(c) Augmented matching

Start with the empty matching N.
For each man, set the next-to-propose woman to the woman of his highest preference.
So long as N contains less than n edges, repeat:
    Take a man m not engaged (a vertex of M not matched by N).
    Let w be the next-to-propose woman for m.
    If w is not engaged (not matched by N), add the pair (m,w) to N.
    else do the following:
        Let $(m',w) \in N$ currently.
        If m has higher preference than m' to w, replace (m',w) by (m,w) in N,
        else keep N as it is.
    Update the next-to-propose woman for m to his next preference.
Return N.

	1	2	3	4
A	E	H	F	G
B	H	G	E	F
C	E	H	F	G
D	H	F	E	G

Men's choices

	1	2	3	4
E	D	C	B	A
F	C	B	A	D
G	B	D	C	A
H	B	C	A	D

Women's choices

	A	B	C	D
E	4	3	2	1
F	3	2	1	4
G	4	1	3	2
H	3	1	2	4

Women's choices

Man's action	Woman's reaction	Current matching (N)
–	–	$\emptyset$
A proposes to E	E accepts A	$\{(A,E)\}$
B proposes to H	H accepts B	$\{(A,E),(B,H)\}$
C proposes to E	E replaces A by C	$\{(B,H),(C,E)\}$
D proposes to H	H rejects D	
A proposes to H	H rejects A	
B is already engaged		
C is already engaged		
D proposes to F	F accepts D	$\{(B,H),(C,E),(D,F)\}$
A proposes to F	F replaces D by A	$\{(A,F),(B,H),(C,E)\}$
B is already engaged		
C is already engaged		
D proposes to E	E replaces C by D	$\{(A,F),(B,H),(D,E)\}$
A is already engaged		
B is already engaged		
C proposes to H	H rejects C	
D is already engaged		
A is already engaged		
B is already engaged		
C proposes to F	F replaces A by C	$\{(B,H),(C,F),(D,E)\}$
D is already engaged		
A proposes to G	G accepts A	$\{(A,G),(B,H),(C,F),(D,E)\}$