

## Maximum weight matching

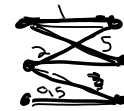
- Bipartite graphs are tremendously useful for modeling:
  - Jobs and machines
  - Employers, employees
  - Ads with ad slots
  - Men with women

## Matching

- Set of edges with no common endpoints.



- Maximum weight matching: maximum sum of weights on edges.



## Max weighted matching problem

- Given a weighted bipartite graph, how can we find a maximum weight matching efficiently?

## Ascending auction algorithm for integer weights (n by m)

Fix bid increment

prices on items :

Initially prices 0, and matching empty

As long as matching not maximum,

Pick unmatched bidder  $i$ , have him bid on item  $j$  in

If  $j$  unmatched, then  $M(i) := j$ ,

else, say  $M(k)=j$ ,

Remove  $(k,j)$  from matching and add  $(i,j)$ , i.e.  $M(i) := j$

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