

Matching games

1. A matching is stable if ...
 - (a) it is produced by random assignment
 - (b) the two sides have equal size
 - (c) everyone gets their first choice
 - (d) it has no blocking pair
2. A pair (s, r) blocks a matching if ...
 - (a) they are matched together
 - (b) neither has a partner
 - (c) they have the same preferences
 - (d) they are not matched together but each prefers the other to their current partner
3. The Gale-Shapley algorithm always ...
 - (a) fails when preferences differ
 - (b) returns every stable matching
 - (c) returns the matching that maximises total happiness
 - (d) terminates and returns a stable matching
4. The matching returned by Gale-Shapley is ...
 - (a) the same whoever proposes
 - (b) optimal for the receiving side
 - (c) optimal for the proposing side and worst for the receiving side
 - (d) optimal for both sides
5. A matching between two sets of equal size is ...
 - (a) a bijection pairing each member of one set with one member of the other
 - (b) a payoff matrix
 - (c) a set of blocking pairs
 - (d) a ranking of all participants
6. For any matching game, a stable matching ...
 - (a) exists only with an even number of participants
 - (b) is always unique
 - (c) may fail to exist
 - (d) always exists

7. The Gale-Shapley algorithm is guaranteed to ...
 - (a) run forever for some preferences
 - (b) produce an unstable matching
 - (c) terminate after finitely many proposals
 - (d) require a central planner
8. When a proposer is rejected, it ...
 - (a) is matched at random
 - (b) proposes to its top choice again
 - (c) leaves the market unmatched
 - (d) proposes to the next reviewer on its preference list
9. A reviewer in Gale-Shapley ...
 - (a) tentatively holds the best proposer seen so far and rejects the rest
 - (b) proposes to suitors
 - (c) accepts the first proposer permanently
 - (d) accepts everyone
10. Gale-Shapley is worst for ...
 - (a) the proposing side
 - (b) neither side
 - (c) both sides equally
 - (d) the receiving (non-proposing) side
11. A matching game's stable matching ...
 - (a) always exists, but need not be unique
 - (b) is always unique
 - (c) exists only with identical preferences
 - (d) may not exist
12. If every participant receives their first choice, the matching is ...
 - (a) stable
 - (b) blocked by every pair
 - (c) unstable
 - (d) impossible
13. In a matching game, each participant has ...

- (a) a strict preference ordering over the participants on the other side
 - (b) no information about the other side
 - (c) a payoff matrix against every other participant
 - (d) a single fixed partner assigned in advance
14. A matching pairs ...
- (a) members within the same set
 - (b) each member of one set with exactly one member of the other set
 - (c) some members, leaving others unmatched
 - (d) one member with several others
15. Stability matters because an unstable matching ...
- (a) contains a pair who would both abandon their partners for each other
 - (b) always gives everyone their last choice
 - (c) is impossible to compute
 - (d) uses more than two sets
16. In a matching game of size N , a proposer's preference is a map $f : S \rightarrow R^N$, that is ...
- (a) a subset of acceptable reviewers
 - (b) a full ordered list of all reviewers
 - (c) a single most-preferred reviewer
 - (d) a probability distribution over reviewers
17. Different executions of the Gale-Shapley algorithm (proposing in a different order) ...
- (a) can return different stable matchings
 - (b) always return the same stable matching
 - (c) return an unstable matching
 - (d) may fail to terminate
18. When a reviewer holding a proposal receives a new proposal they prefer, they ...
- (a) reject both proposers
 - (b) must accept both
 - (c) switch to the new proposer and reject the current one
 - (d) keep the current proposer regardless
19. The proof of suitor-optimality shows that no proposer is ever rejected by ...
- (a) a stable partner: a reviewer it is matched to in some stable matching

- (b) the reviewer at the top of its list
 - (c) more than one reviewer
 - (d) any reviewer at all
20. In the suitor-optimal stable matching, each reviewer receives ...
- (a) a randomly chosen partner
 - (b) the worst partner they could have in any stable matching
 - (c) the best partner they could have in any stable matching
 - (d) their first choice