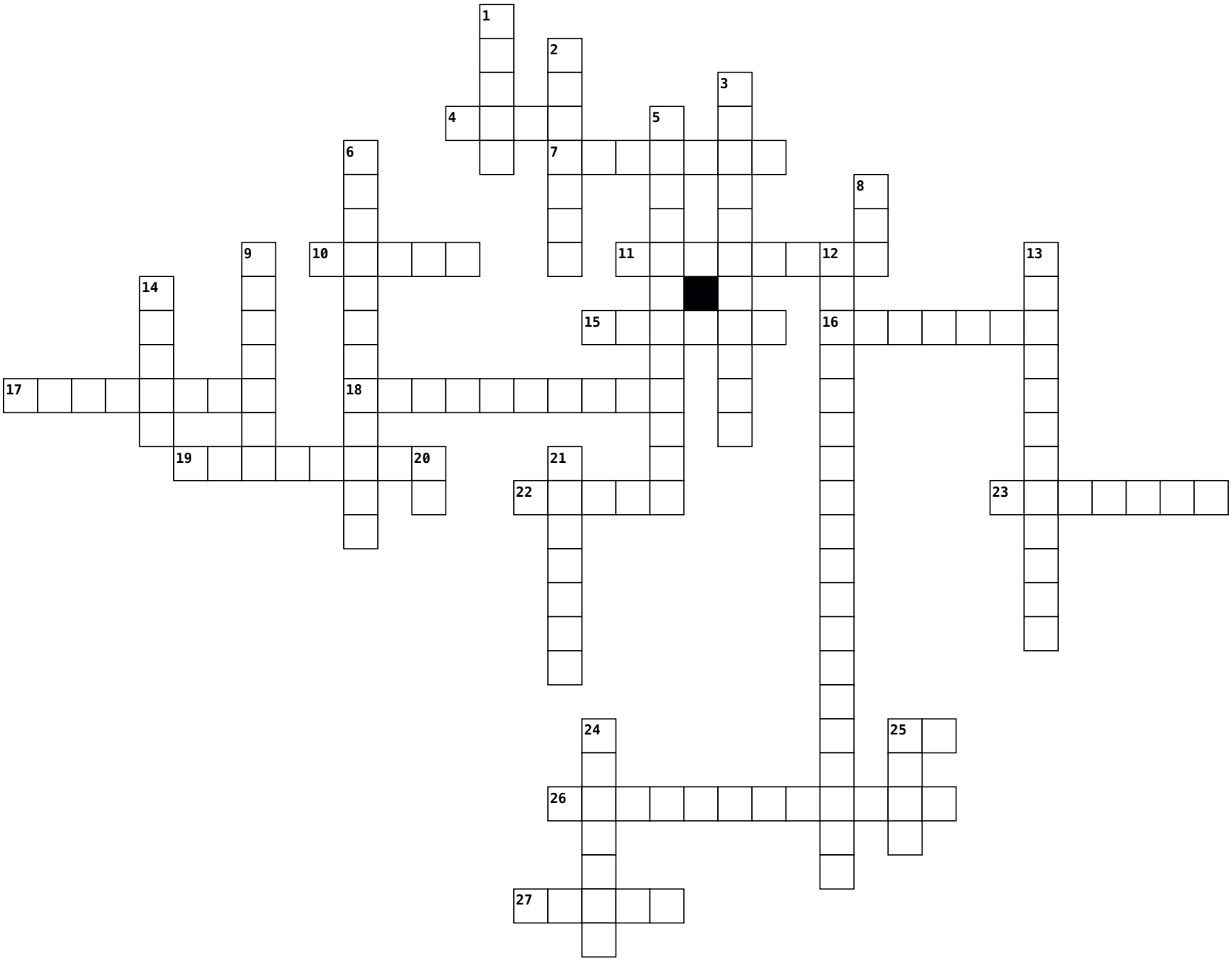
Crossword Puzzle: Sets, Relations and Lattices



Across

4. – The least upper bound of two elements in a lattice.

7. – Another term for greatest lower bound.

10. – The smallest element of a poset (denoted by 0 in lattices).

11. – The largest element of a poset (denoted by 1 in lattices).

15. – A set whose elements all belong to another set.

16. – A weaker condition than distributive, satisfied if $a \leq c \Rightarrow a \vee (b \wedge c) = (a \vee b) \wedge c$.

17. – Another term for least upper bound.

18. – All elements not in a given set but in the universal set.

19. – A subset of the Cartesian product of two sets.

22. – A diagram used to represent a finite poset without drawing transitive edges.

23. – A lattice with both least and greatest elements.

25. – The diamond lattice; modular but not distributive.

26. – A lattice where each element has a complement.

27. – The set of all elements related to a given element under an equivalence relation.

Down

1. – The operation combining all elements from two sets.

2. – An element with no smaller element below it in a poset.

3. – A relation that is reflexive, symmetric, and transitive.

5. – A lattice where meet and join distribute over each other.

6. – Common elements between two sets.

8. – A well-defined collection of distinct objects.

9. – An element with no greater element above it in a poset.

12. – Elements in either of two sets, but not in both.

13. – A relation that is reflexive, antisymmetric, and transitive.

14. – A set together with a partial order relation.

20. – The pentagon lattice; neither distributive nor modular.

21. – A poset where every two elements have a meet and join.

24. – A bounded, complemented, and distributive lattice.

25. – The greatest lower bound of two elements in a lattice.