1.1. An acyclic directed graph is given. Cover all its vertices with the minimum number of vertex-disjoint paths.

1.2. The maximum independent set problem. Given a bipartite graph. Choose the maximum number of vertices so that there is no edge connecting the selected vertices.

1.3. Given a bipartite graph and a maximum matching in it. Check if this is the only maximum matching in $O(n+m)$.

1.4. Prove that a d-regular bipartite graph (that is, a graph in which the degrees of all vertices are equal to d) has a perfect matching, and that a d-regular graph can be decomposed into d disjoint perfect matchings.

1.5. The defect of the set of vertices of the left part in the graph is $def(A) = |N(A)| - |A|$. Find a set with minimal defect in a bipartite graph.

1.6. There is a board $n \times n$, some cells of which have been removed. Put the maximum number of dominoes 2×1 on the board.

1.7. There is a board $n \times n$, some cells of which have been removed. Place the maximum number of chess knights so that they do not attack each other.

1.8. There is a board $n \times n$, some cells of which have been removed. Place the maximum number of rooks so that they do not attack each other (rooks attack through empty squares).

1.9. There is a board $n \times n$, each cell is either free or with a wall. Place the maximum number of rooks so that they do not attack each other (rooks do not attack through walls).