1.1. Is it true that if you sort the vertices by the exit time of the DFS (like in topological sorting algorithm), then the number of edges going from right to left will be minimal possible?

1.2. Is it true that you can make the topological sorting of digraph if you sort the vertices by the entry time in increasing order?

1.3. Find a Hamiltonian path in the given acyclic digraph, or say that it does not exist. $O(n + m)$.

1.4. For each vertex of the graph, find the vertex with the minimum number reachable from it. $O(n+m)$.

1.5. In the city there are n crossroads connected by m one-way roads. It is necessary to establish several quick response points in the city. It costs c_i to set a response point at the intersection i. How much money do you need to spend to make all the intersections reachable from at least one response point?

1.6. Given a number n and m pairs (a_i, b_i). You need to build a directed graph on n vertices with the minimum number of edges, in which for each pair there is a path from a_i to b_i.

1.7. Find the solution for the given 2-SAT problem which is lexicographically minimal (that is, a sequence of values x_1, x_2, ..., x_n is lexographically minimal of all sequences on which the formula is true).

1.8. Consider the specific case of 2-SAT problem where for each bracket $(X|Y)$ there is a symmetrical bracket $(!X|!Y)$ (and for $(!X|Y)$ respectively $(X|!Y)$). Find the solution of that problem with minimal possible number of variables set to true.

Find a 2-SAT solution with the minimum number of variables equal to 1. Just kidding, this is an NP-complete problem. But if for each bracket $(X|Y)$ there is a paired bracket $(!X|!Y)$ (and for $(!X|Y)$ respectively $(X|!Y)$), then the problem can be solved ... How?