# FALL 1998: **COMP 7/8713: Advanced Algorithms**

Due Nov 30, in class

---

## Problems

23. (**R**)
    INSTANCE: Boolean formula in 3-CNF.
    QUESTION: Is there a truth assignment that makes exactly one literal per clause true?

    Prove that the above problem is NP-Complete.

24. (**R**) Solve problem 37.2-2, p973.
25. (**Ex**) Problem 18.1-1, p360.
26. (**R**) Use the potential method to solve 18.2-1, p363.
27. (**R**) Solve 35.2-5
28. (**EC**) Given $n$ points in the plane, a *rectilinear network* (also called a Manhattan network) is a connected network on the input points using only horizontal and vertical line segments. Consider the problem of constructing a minimum length rectilinear network so that between any pair of points $u$ and $v$, the network has a rectilinear shortest path from $u$ to $v$. Prove that the problem is NP-hard, or design a polynomial-time algorithm to solve it, or design a good approximation algorithm for it.
29. (**R**) Solve 34.4-1, p875.
30. (**Ex**) Solve the closest-pair problem using Voronoi diagrams. Prove that your algorithm is correct.