British Informatics Olympiad Final

3–5 April, 1998

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Testing

Consider the problem "**Break Out**" printed below. Suppose this question had been set as one of the BIO programming tasks. How would you go about testing a program that was submitted for solving this task? You are free to mention anything you feel would be relevant; for example the tests you would apply, why you would use them and how you would judge them, and what restrictions you would place on the problem.

Break Out

A group of prisoners are trying to tunnel their way out of prison. The prison grounds can be considered to be a rectangular grid, with the prisoners situated on some of the intersections of the grid lines, and the tunnels following these lines (elsewhere the rock is too hard). To prevent the discovery of one tunnel leading the discovery of another, the tunnels are not allowed to intersect. Prisoners can escape if they can reach any point on the boundary of the prison. Given a set of prisoners (with positions) the objective is build a network of tunnels so they can all escape, and to print out how this is done.

An example problem, with a graphical solution, is shown below. Black circles denote prisoners, and heavy lines denote tunnels.