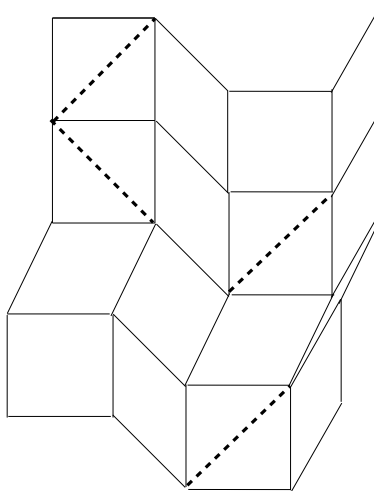(1)   Suppose that you are given an $n \times n$ grid of unit–length rods, jointed at their ends. You may
      brace some subset S of the small squares with diagonal segments (of length $\sqrt{2}$).
      Which choices of S suffice to make the grid rigid in the plane?

      Example of a grid:

      This 4×4 grid has 4 diagonal segments (dashed). It is not rigid, since we can rotate the
      horizontal rods of the second column (beside others).

      This exercise was taken from Peter Winkler's book: *Mathematical Mind Benders,* A K Peters,
      Ltd., 2007, ISBN: 978-1-56881-336-3.