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**0. Practice sheet for the lecture:**  
**Vorlesung über Graphentheorie (DS II)**

**Felsner, Heldt**

4. October

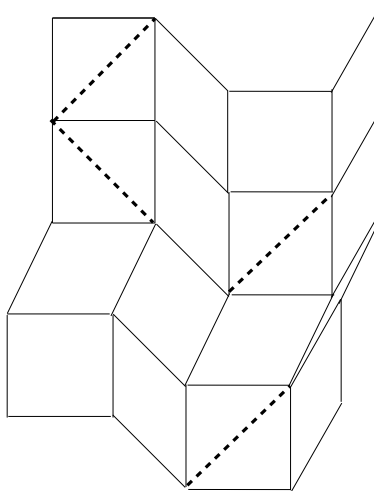
Delivery date: none.

<http://www.math.tu-berlin.de/~felsner/Lehre/dsII11.html>

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- (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  $4 \times 4$  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.