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Dynamic representations of islands with Mathematica

Let a rectangular grid of size mxn be given. A height is assigned to each cell of the grid. We call a rectangular shaped part of the grid an island, if all of its cells are higher than its neigbouring cells. By fixed gridsize and neigbourhood-relation there exist optimal island-configurations, i.e, distribution of heights where the number of islands are maximal. We aim to explore those configurations. Our approach can be treated as a case study for computer-supported systematic theory exploration. In this talk we focus on the demonstration of available computer visualization tools which may make the exploration interesting and effective. Most of the tools developed by us are interactive. Our work is done in the Mathematica system.