

1. Reduce to hamiltonian path counting. There's an edge between  $v_i$  and  $v_j$ , iff  $i + j$  is a perfect square.  $O(2^n \cdot n^2)$ .
2. dfs. If we generate  $A$  at random, then for each edge it only has  $O(\frac{1}{\sqrt{U}})$  probability of being a perfect square. There are only  $U^n$  choices for the input, so under certain assumptions, even in the worst case the average degree of the graph is  $O(1)$ , and the running time is still  $O(c^n)$  (instead of  $O(n!)$ ).

## References