

**Wormald, Nicholas C.**

**Generating random regular graphs.** (English) Zbl 0543.68048  
*J. Algorithms* 5, 247-280 (1984).

Summary: An algorithm is described which generates a random labeled cubic graph on  $n$  vertices. Also described is a procedure which, if successful, generates a random  $(0,1)$ -matrix with prescribed row and column sums. The latter yields procedures which, if successful, generate random labeled graphs with specified degree sequence and random labeled bipartite graphs with specified degree sequences. These procedures can be implemented so that each trial requires time which is linear in the number of vertices plus edges, but in generating a random  $r$ -regular graph, the probability of success of a given trial is about  $\exp((1 - r^2)/4)$ , which is prohibitively small for large  $r$ . Comparisons are made between the complexities of the two methods of generating random cubic graphs. The two general schemes presented derive from methods which have been used to enumerate regular graphs, both asymptotically and exactly.

**MSC:**

**68R10** Graph theory (including graph drawing) in computer science  
**05C80** Random graphs (graph-theoretic aspects)

Cited in **1** Review  
Cited in **4** Documents

**Keywords:**

algorithm; random labeled cubic graph; random  $(0,1)$ -matrix; random labeled graphs; random labeled bipartite graphs; regular graphs

**Full Text:** [DOI](#)