Re: Permutations counting problem

Source: http://sci.tech−archive.net/Archive/sci.math/2004−10/4071.html

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From: Rani Sharoni (*rani_sharoni_at_hotmail.com*)
Date: 10/14/04

Date: Thu, 14 Oct 2004 11:41:09 +0200

Gerry Myerson wrote:
> In article <df893da6.0410130102.523af172@posting.google.com>,
> rani_sharoni@hotmail.com (Rani Sharoni) wrote:
>
>> What is the number of enumerations, starting from identity, of all
>> n−length permutations, without repetitions, where each step is a
>> transposition (i.e. changing exactly two elements)?
>>
>> Let's call such enumeration a "low const path".
>>
>> Examples of two low cost paths for 3−length permutation:
>> 123 ; identity 123 ; identity
>> 132 ; (2,3) 321 ; (1,3)
>> 231 ; (1,3) 231 ; (1,2)
>> 213 ; (2,3) 213 ; (2,3)
>> 312 ; (1,3) 312 ; (1,3)
>> 321 ; (2,3) 132 ; (1,2)
>>
*>> I counted 3*2*2=12 paths for 3−length.*
>
> Let me see if I understand the problem.
>
> You have a graph. There is one vertex for each permutation on n
> symbols, and there is an edge between vertices if you can get
> from the one permutation to the other by a single transposition.
> You want the number of hamiltonian paths in this graph.

Exactly

> I have no idea how to answer it,

Same here.
It looks like a simple counting problem but I can't even think about
reasonable algorithm that enumerates all paths

> but this looks like a more
> mathematician−friendly way to ask it.

I hope so

> *If you can calculate it for a few small values of n, you can*
> *try looking up the terms in Sloane's online encyclopedia of*
> *integer sequences.*

Good idea.

Thanks,
Rani