## A Very Short (Bijective!) Proof of Touchard's Catalan Identity

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### <u>.pdf</u> <u>.ps</u> <u>.tex</u>

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# It is still fun to find bijective proofs of identities, even if they are shaloshable!

Added March 24, 2015: It turns out that our nice bijection was too nice not to have been known before. See the <u>insightful comments</u> by Dominique Gouyo-Beauchamp, Kyle Petersen, and Dennis Stanton.

# Maple Package

• <u>TOUCHARD</u>, A short Maple package, implementing the bijection (and its inverse), and checking, empirically, that it is indeed a bijection!

#### An Input and Output file for the Maple package TOUCHARD

• If you want to confirm that everything works fine up to n=9

the <u>input</u> yields the <u>output</u>

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