IS DREIDEL EXPECTED TO LAST $O(NUTS^2)$ SPINS?

Doron ZEILBERGER [1]

According to my Maple package `DREIDEL` (downloadable from my website), the expected number of spins, in a 2-player Dreidel game, that starts with each player having $NUTS$ nuts, and terminates as soon as one of the players runs out of nuts, equals, for $NUTS = 1, \ldots, 25$:

[0, 2.400000000, 8.329934935, 18.11361402, 32.14410851, 50.57079312,

73.42689226, 100.7185523, 132.4464689, 168.6106885, 209.2111984,

254.2479934, 303.7210720, 357.6304337, 415.9760785, 478.7580063,

545.9762172, 617.6307111, 693.7214880, 774.2485480, 859.2118910,

948.6115170, 1042.447426, 1140.719618, 1243.428093] .

Hence it seems very likely that the expected duration of such a Dreidel game is $O(NUTS^2)$, or more precisely, $a*(NUTS)^2+b*NUTS+c+o(NUTS)$, where $a = 2.21814\ldots$, $b = -5.9804585\ldots$, and $c = 6.601118\ldots$. I am offering *Hanukkah gelt* in the amount of \$25, for settling this conjecture. I am offering an additional \$25 for a (positive) confirmation of my conjecture (for which I do not have any evidence) that it takes, on the average, $O(NUTS^k)$ spins to complete a $k-player$ Dreidel game.

[1] Department of Mathematics, Temple University, Philadelphia, PA 19122, USA. `zeilberg@math.temple.edu` `http://www.math.temple.edu/~zeilberg/` . 30 Kislev, 5760 [Dec. 9, 1999]. Supported in part by the NSF. Exclusive for the Personal Journal of Ekhad and Zeilberger `http://www.math.temple.edu/~zeilberg/pj.html`