Suppose that we want to model Plinko/Galton board by supposing that a ball (1) is equally likely to bounce in either direction off of the first peg, and (2) will bounce in the same direction that it previously bounced with probability p. For example, when $p = 1$, it will always bounce in the same direction, when $p = 1/2$ it is equally likely to bounce in either direction at any peg, and when $p = 0$, it will alternate left-right-left-right (or vice versa).

$p = 1/3$	$p = 2/3$	$p = 5/6$
1	1	1
1 1	1 1	1 1
1 4 1	2 2 2	5 2 5
1 8 8 1	4 5 5 4	25 11 11 25
1 12 28 12 1	8 12 14 12 8	125 60 62 60 125
1 16 64 64 16 1	16 28 37 37 28 16	625 325 346 346 325 625
1 20 116 212 116 20 1	32 64 94 106 94 64 32	3125 1750 1915 1972 1915 1750 3125
1 24 184 520 520 184 24 1	64 144 232 289 289 232 144 64	15625 9375 10525 11131 11131 10525 9375 15625
1 28 268 1052 1676 1052 268 28 1	128 320 560 760 838 760 560 320 128	78125 50000 57500 62320 63982 62320 57500 50000 78125

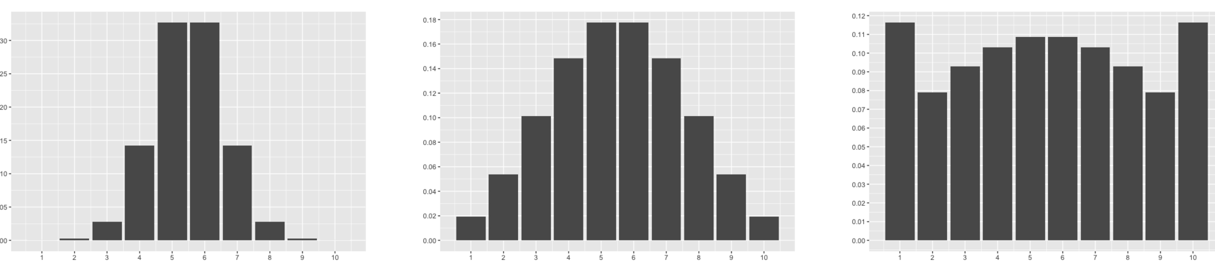

Figure 1: Illustrations for numerators of $p = 1/3$, $p = 2/3$ and $p = 5/6$, followed by probably mass functions of the respective tenth rows.

Question. For an arbitrary $p \in [0, 1]$, and a triangle with n rows, what is the distribution of balls in bin k?

Related.

1. What is the least/greatest value of p such that at the $(2n)$-th row, the middle is equal to the extreme? How about for the $(2n + 1)$-st row?
2. What if this is done on a different geometry like a cylinder or a tetrahedron?
3. How does this relate to lattice walks? (E.g. see A348595.)
4. As $n \to \infty$, does this converge in distribution to a normal distribution? If so, what is the variance?

References.

A035002: Table of numerators for $p = 2/3$.

A348595: Related to table of numerators for $p = 1/3$.