

	A	B	C	D	E
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2	10.11.2023	45219			
3	ECE 202 Lecture 16	ECE 202 E3	this excel doc calculates the probability of getting a certain number of heads at 50% heads and 55% heads		
4	Adapting N = 4 coins to N <= 20	Adapting for N = 10 and P = .55			
5					
6	number of coins (N <= 20)	10			
7	predict total # of microstates (n)	= 2^B6			
8	predict total # of macrostates	= 1+B6	q (probability of inverse result)	Most Likely Number of heads FAIR	Most Likely Number of heads WEIGHTED
9	Weighted Probability (P)	0.55	= 1-B9	= A25	= A26
10	Fair Probability(P)	0.5	= 1-B10		
11					
12		count microstates	Check NEW vs. OLD ---->	= ABS(C16-D16)	
13		= SUM(B20:B30)		(should be 0%)	
14			OLD, FAIR	NEW, FAIR	NEW, WEIGHTED
15	check total # of macrostates	check total # of microstates	check total probability	check total probability	check total probability
16	= COUNT(A20:A38)-B8	= SUM(B20:B30)-B7	= SUM(C20:C30)	= SUM(D20:D30)	= SUM(D20:D38)
17	(should be zero)	(should be zero)	(should be 100%)	(should be 100%)	(should be 100%)
18			heads 50% of the time	heads 50% of the time	heads 55% of the time
19	Macrostate n (# of heads showing)	# of microstates	Fair Probability P(n) OLD	Fair Probability P(n) NEW	Weighted Probability P(n) NEW
20	0	= FACT(B\$6) / (FACT(A20) * FACT(B\$6-A20))	= B20/\$B\$7	= \$B\$10^\$A20 * \$C\$10^(\$B\$6-\$A20) * \$B20	= \$B\$9^\$A20 * \$C\$9^(\$B\$6-\$A20) * \$B20
21	= A20+1	= FACT(B\$6) / (FACT(A21) * FACT(B\$6-A21))	= B21/\$B\$7	= \$B\$10^\$A21 * \$C\$10^(\$B\$6-\$A21) * \$B21	= \$B\$9^\$A21 * \$C\$9^(\$B\$6-\$A21) * \$B21
22	= A21+1	= FACT(B\$6) / (FACT(A22) * FACT(B\$6-A22))	= B22/\$B\$7	= \$B\$10^\$A22 * \$C\$10^(\$B\$6-\$A22) * \$B22	= \$B\$9^\$A22 * \$C\$9^(\$B\$6-\$A22) * \$B22
23	= A22+1	= FACT(B\$6) / (FACT(A23) * FACT(B\$6-A23))	= B23/\$B\$7	= \$B\$10^\$A23 * \$C\$10^(\$B\$6-\$A23) * \$B23	= \$B\$9^\$A23 * \$C\$9^(\$B\$6-\$A23) * \$B23
24	= A23+1	= FACT(B\$6) / (FACT(A24) * FACT(B\$6-A24))	= B24/\$B\$7	= \$B\$10^\$A24 * \$C\$10^(\$B\$6-\$A24) * \$B24	= \$B\$9^\$A24 * \$C\$9^(\$B\$6-\$A24) * \$B24
25	= A24+1	= FACT(B\$6) / (FACT(A25) * FACT(B\$6-A25))	= B25/\$B\$7	= \$B\$10^\$A25 * \$C\$10^(\$B\$6-\$A25) * \$B25	= \$B\$9^\$A25 * \$C\$9^(\$B\$6-\$A25) * \$B25
26	= A25+1	= FACT(B\$6) / (FACT(A26) * FACT(B\$6-A26))	= B26/\$B\$7	= \$B\$10^\$A26 * \$C\$10^(\$B\$6-\$A26) * \$B26	= \$B\$9^\$A26 * \$C\$9^(\$B\$6-\$A26) * \$B26
27	= A26+1	= FACT(B\$6) / (FACT(A27) * FACT(B\$6-A27))	= B27/\$B\$7	= \$B\$10^\$A27 * \$C\$10^(\$B\$6-\$A27) * \$B27	= \$B\$9^\$A27 * \$C\$9^(\$B\$6-\$A27) * \$B27
28	= A27+1	= FACT(B\$6) / (FACT(A28) * FACT(B\$6-A28))	= B28/\$B\$7	= \$B\$10^\$A28 * \$C\$10^(\$B\$6-\$A28) * \$B28	= \$B\$9^\$A28 * \$C\$9^(\$B\$6-\$A28) * \$B28
29	= A28+1	= FACT(B\$6) / (FACT(A29) * FACT(B\$6-A29))	= B29/\$B\$7	= \$B\$10^\$A29 * \$C\$10^(\$B\$6-\$A29) * \$B29	= \$B\$9^\$A29 * \$C\$9^(\$B\$6-\$A29) * \$B29
30	= A29+1	= FACT(B\$6) / (FACT(A30) * FACT(B\$6-A30))	= B30/\$B\$7	= \$B\$10^\$A30 * \$C\$10^(\$B\$6-\$A30) * \$B30	= \$B\$9^\$A30 * \$C\$9^(\$B\$6-\$A30) * \$B30