Calculating Each Party's Overall Odds of Winning

Once we've determined the individual race odds, we can calculate each party's overall odds of winning by evaluating all possible combinations which can occur. In general, there are 2^n possible combinations where n is the number of races. In the 2022 Midterms, there are **35** Senate races with a total of **2^35** or over **34 billion** possible outcomes.

Each party currently controls 50 seats in the Senate. For the purpose of this exercise, let's assume that each party will win the seats they currently hold with the exception for the following 4 races and that we have these hypothetical odds

Race	Dem %	Rep %
AZ	70	30
GA	60	40
NV	45	55
PA	65	35

In this scenario, the party count is:

Democrats	47
Republicans	49
Pending races	4

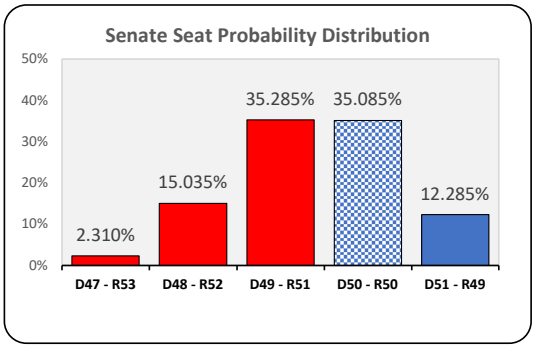
With 4 races there are 2^4 = 2x2x2x2 = 16 possible outomes as follows:

# Dem wins	# Ways to win:	AZ		GA		NV		PA		Odds of Occurring *		Sum %
0	1 Way	0.30	x	0.40	x	0.55	x	0.35	=	2.310%	=	2.310%
1	4 Ways	0.30	x	0.40	x	0.55	x	0.65	=	4.290%	}	15.035%
		0.30	x	0.40	x	0.45	x	0.35	=	1.890%		
		0.30	x	0.60	x	0.55	x	0.35	=	3.465%		
		0.70	x	0.40	x	0.55	x	0.35	=	5.390%		
2	6 Ways	0.30	x	0.40	x	0.45	x	0.65	=	3.510%	}	35.285%
		0.30	x	0.60	x	0.55	x	0.65	=	6.435%		
		0.70	x	0.40	x	0.55	x	0.65	=	10.010%		
		0.30	x	0.60	x	0.45	x	0.35	=	2.835%		
		0.70	x	0.40	x	0.45	x	0.35	=	4.410%		
		0.70	x	0.60	x	0.55	x	0.35	=	8.085%		
3	4 Ways	0.30	x	0.60	x	0.45	x	0.65	=	5.265%	}	35.085%
		0.70	x	0.40	x	0.45	x	0.65	=	8.190%		
		0.70	x	0.60	x	0.55	x	0.65	=	15.015%		
		0.70	x	0.60	x	0.45	x	0.35	=	6.615%		
4	1 Way	0.70	x	0.60	x	0.45	x	0.65	=	12.285%	=	12.285%
	16 Ways									**100.000%**		

*For each outcome, the Odds of Occurring is equal to the product of the individual race probabilities for that event. For example, the odds of the Republicans winning every race is equal the product of the odds of them winning each individual race: 0.30 x 0.40 x 0.55 x 0.35 = 0.02310 = 2.310%. Likewise, the odds of the Democrats winning every race is equal to the product of the odds of them winning each individual race: 0.70 x 0.60 x 0.45 x 0.65 = 0.12285 = 12.285%.

# Dem wins	Summary	Result	Odds
0	D47 - R53	Rep win	2.310%
1	D48 - R52	Rep win	15.035%
2	D49 - R51	Rep win	35.285%
3	D50 - R50	Dem win	35.085%
4	D51 - R49	Dem win	12.285%

Overall Odds	Win%
Democrats	47.37%
Republicans	52.63%



Use *The Senate Wizard℠* to obtain these same results. Move the probability slider for each race to 100% for the races each party is defending, except for the 4 races which can be set to its odds with its own slider

The Senate Wizard handles all 35 races and calculates each party's Overall Odds of winning by evaluating all 34+ billion possible outcomes, using whatever odds it's given. Each slider defaults to the market-odds for its race