

2020 US Senate Elections

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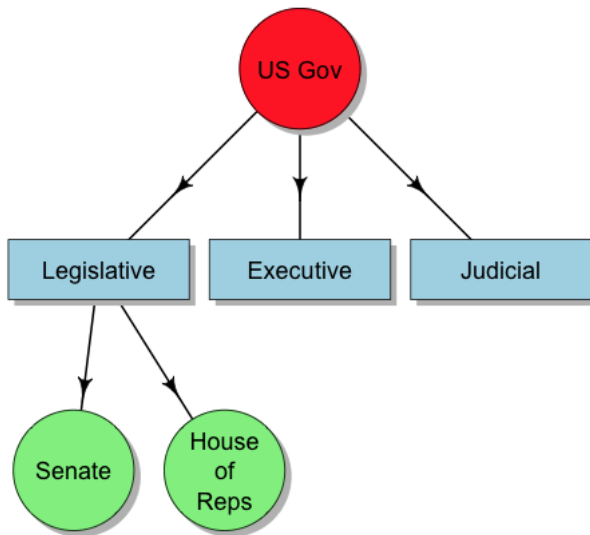
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Overview

- 1 Government Structure
- 2 Party Breakdown of Current Senate
- 3 Forecast of Party Breakdown after 2020 Senate Election

Overview of US Government



The Senate and the House of Representatives

Senate

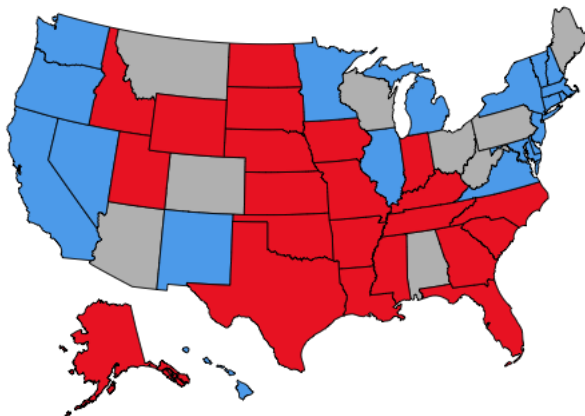
- 100 members; 2 from each state
- 6-year terms (staggered across even years)

House of Representatives

- 435 members; number from each state determined by population
- 2-year terms (every even year)

Current Senate Map

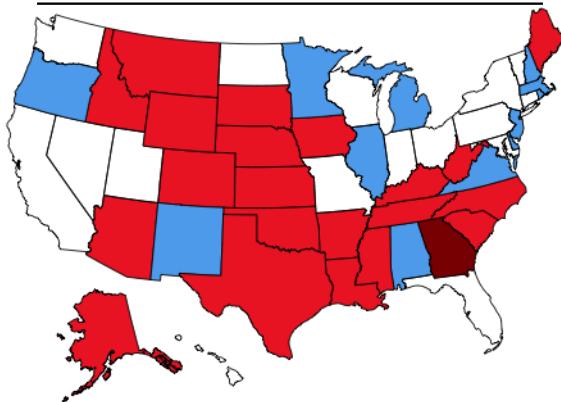
	Rep	Dem
Current	53	47



1 of each 2 dem 2 rep NA

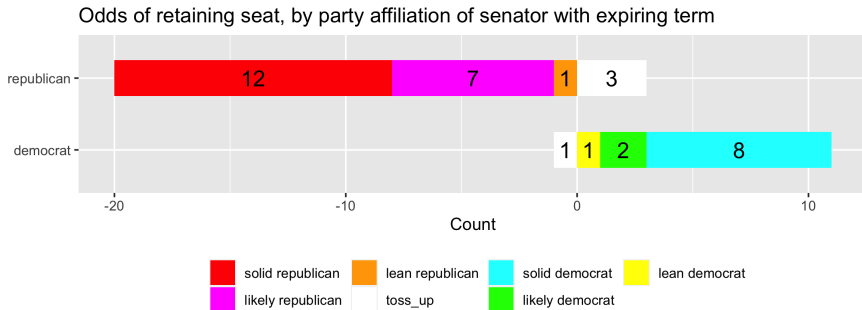
Senators with Seats up for Election in 2020

	Rep	Dem
Current	53	47
To be contested in 2020	23	12



2 republican 1 republican 1 democrat NA

Breakdown of Result Probabilities



Toss-Up Races

Rep-controlled	Dem-controlled
Martha McSally, AZ	Doug Jones, AL
Cory Gardner, CO	
Susan Collins, ME	

Formalizing Probabilities

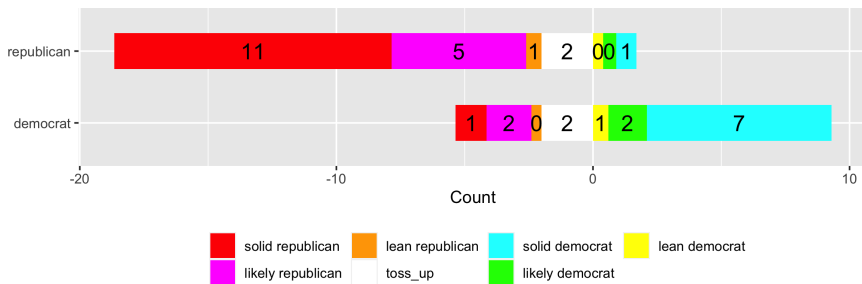
We define the following probabilities:

Category	Probability
Solid	.9
Likely	.75
Lean	.6
Toss-Up	.5

Then, assuming an independence assumption amongst races, we have eight binomial random variables, $\{R_S, R_{Li}, R_{Le}, R_T, D_T, D_{Le}, D_{Li}, D_S\}$. More succinctly, $\{X_i\}$, where $X \in P = \{R, D\}$ and $i \in R = \{S, Li, Le, T\}$. Let each of these variables take on 1 if a democrat wins and 0 otherwise. Now, we need

$$\mathbb{P}\left(\sum_{X \in P} \sum_{i \in R} X_i \geq 15\right)$$

Odds of retaining seat, by party affiliation of senator with expiring term



Party	R_S	R_{Li}	R_{Le}	T	D_{Le}	D_{Li}	D_S	Seats	Total
Rep	11	5	1	2	0	0	1	20	50
Dem	1	2	0	2	1	2	7	15	50

The End