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Can we get more students to take the SAT?



Problem Statement

Students in the United States(U.S) either take the ACT or SAT as a requirement for college admission. Participation rate(%) in the SAT across states are not uniform. Through analysis of SAT historical data, this project aims to provide insights and recommendation for the College Board on improving SAT participation (%).

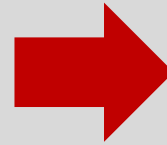
Historically, the other alternative for college admission is the **ACT**...

Datasets from official ACT and SAT websites:

- ACT 2017, 2018
- SAT 2017, 2018

Test components					
	state	part_sat_2018	erw_sat_2018	math_sat_2018	total_sat_2018
0	Alabama	0.06	595	571	1166
1	Alaska	0.43	562	544	1106
2	Arizona	0.29	577	572	1149
3	Arkansas	0.05	592	576	1169
4	California	0.60	540	536	1076
5	Colorado	1.00	519	506	1025
6	Connecticut	1.00	535	519	1053
7	Delaware	1.00	505	492	998
8	District Of Columbia	0.92	497	480	977
9	Florida	0.56	550	549	1099
10	Georgia	0.70	542	522	1064
11	Hawaii	0.56	480	530	1010
12	Idaho	1.00	508	493	1001
13	Illinois	0.99	513	506	1019
14	Indiana	0.63	542	532	1074
15	Iowa	0.03	634	631	1265
16	Kansas	0.04	633	631	1265
17	Kentucky	0.04	630	618	1248
18	Louisiana	0.04	615	595	1210
19	Maine	0.99	512	501	1013

States



Which states have the lowest SAT participation rate (normalized)?

	state	part_sat_2017		state	part_sat_2018
34	North Dakota	0.02	34	North Dakota	0.02
24	Mississippi	0.02	50	Wyoming	0.03
15	Iowa	0.02	41	South Dakota	0.03
25	Missouri	0.03	27	Nebraska	0.03
44	Utah	0.03	49	Wisconsin	0.03

Fig.2. SAT 2017, 2018 participation rates by states

Which states have the highest ACT participation rate (normalized)?

	state	part_act_2017		state	part_act_2018
0	Alabama	1.0	0	Alabama	1.0
3	Arkansas	1.0	3	Arkansas	1.0
5	Colorado	1.0	17	Kentucky	1.0
17	Kentucky	1.0	18	Louisiana	1.0
18	Louisiana	1.0	24	Mississippi	1.0
23	Minnesota	1.0	25	Missouri	1.0
24	Mississippi	1.0	26	Montana	1.0
25	Missouri	1.0	27	Nebraska	1.0
26	Montana	1.0	28	Nevada	1.0
28	Nevada	1.0	33	North Carolina	1.0
33	North Carolina	1.0	35	Ohio	1.0
36	Oklahoma	1.0	36	Oklahoma	1.0
40	South Carolina	1.0	40	South Carolina	1.0
42	Tennessee	1.0	42	Tennessee	1.0
44	Utah	1.0	44	Utah	1.0
49	Wisconsin	1.0	49	Wisconsin	1.0
50	Wyoming	1.0	50	Wyoming	1.0

Fig.3. ACT 2017, 2018 participation rates by states

Is there a useful link between ACT and SAT?

Fig.1. SAT 2018 mean scores, by state, by component

	state	part_sat_2017
34	North Dakota	0.02
24	Mississippi	0.02
15	Iowa	0.02
25	Missouri	0.03
44	Utah	0.03
41	South Dakota	0.03
27	Nebraska	0.03
49	Wisconsin	0.03
23	Minnesota	0.03
50	Wyoming	0.03
3	Arkansas	0.03
16	Kansas	0.04
17	Kentucky	0.04
18	Louisiana	0.04
0	Alabama	0.05
42	Tennessee	0.05
36	Oklahoma	0.07
13	Illinois	0.09
26	Montana	0.10
5	Colorado	0.11

Fig.5. SAT 2017 lowest participation rate by states

	state	part_sat_2018
5	Colorado	1.00
6	Connecticut	1.00
7	Delaware	1.00
22	Michigan	1.00
12	Idaho	1.00
19	Maine	0.99
13	Illinois	0.99
39	Rhode Island	0.97
29	New Hampshire	0.96
8	District Of Columbia	0.92
30	New Jersey	0.82
21	Massachusetts	0.80
32	New York	0.79
20	Maryland	0.76
38	Pennsylvania	0.70
10	Georgia	0.70
47	Washington	0.69
46	Virginia	0.68
43	Texas	0.66
45	Vermont	0.64

Fig.6. SAT 2018 highest participation rate by states

- It can be observed that there was a significant increment in the SAT participation rate for Illinois and Colorado by ~90% from 2017 to 2018
- Due to change in policy, SAT is mandatory to all high schools juniors for college admissions from 2017

1 - https://www.coloradokids.org/wp-content/uploads/2016/01/ACTvsSAT_FINAL.pdf2 - <https://testive.com/colorado-sat-change-2017/>3 - <https://www.chicagotribune.com/news/ct-illinois-chooses-sat-met-20160211-story.html>4 - <https://testive.com/illinois/>

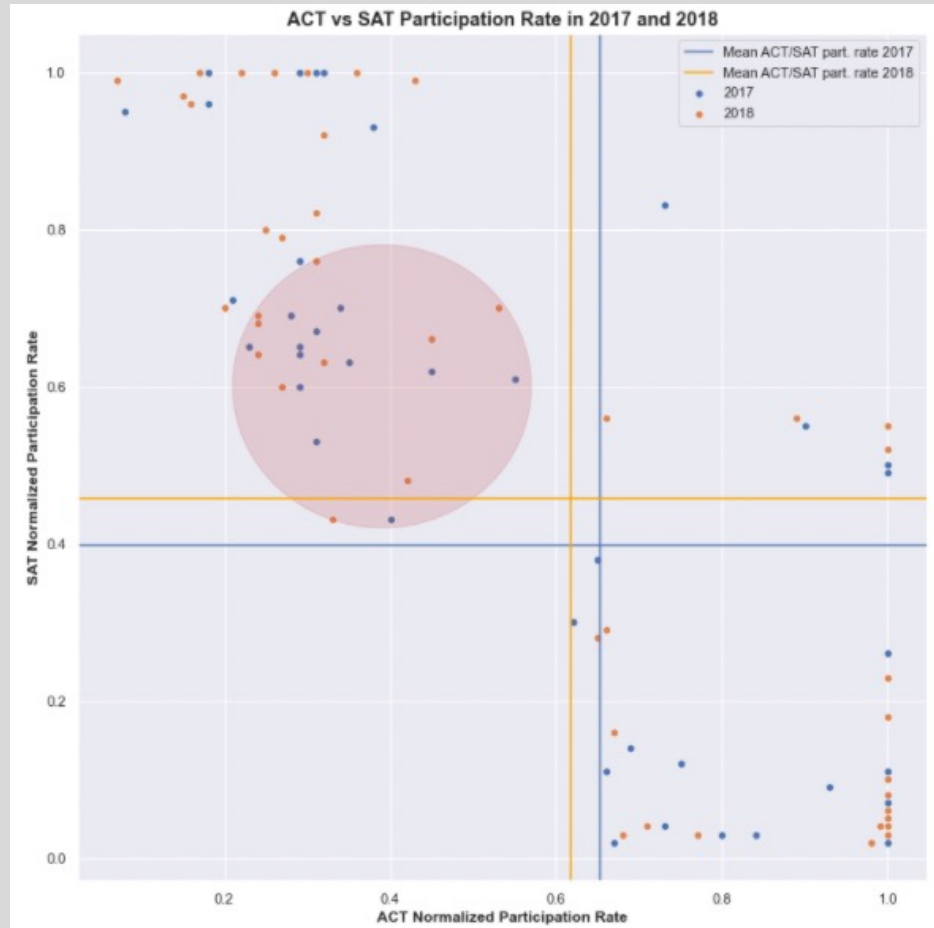


Fig.4. SAT vs ACT participation rate by state 2017 and 2018

If a state has higher than average SAT participation rate, there is a ~95% chance that it will have below average ACT participation rate. This trend is consistent for both 2017 and 2018.

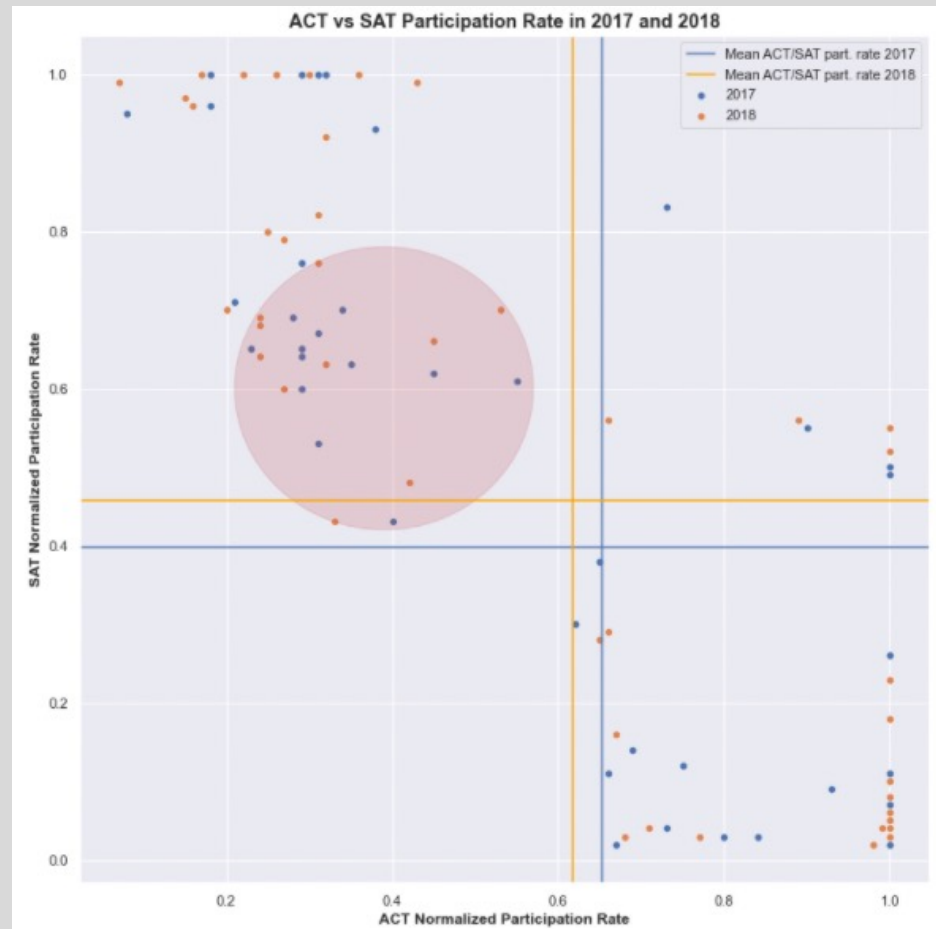


Fig.4. SAT vs ACT participation rate by state 2017 and 2018

16 states that fall within the red circle

California, Connecticut, District of Columbia, Georgia, Idaho, Indiana, Maryland, Massachusetts, Michigan, New Jersey, New York, Oregon, Texas, Vermont, Virginia, Washington

With the observation and analysis:

It is recommended that the resources should focus on the 16 states that have a slightly below average ACT participation rate where the College Board can have an agreement with the 16 states to have SAT mandatory for their college admissions to increase the SAT participation rate.