

Correlation:
SAT and ACT
scores
-
State
temperatures



Context

Why colder countries are richer than hot nations: Theories explain how wealth is linked to temperature - and they hold true for Australia's warmest and coolest cities

(Daily mail - Jul. 2020)

A study showed that for every 1 degree fall in average temperature, the GDP per capita rises by \$762

(Eat my news - Apr. 2021)

The economic advantages of life in a cold country

(CBC - Jan. 2010)

Problem statement

Is there a relation?

US State temperatures

-

US State SAT and ACT
participation rates and scores

Data

1. 2018 SAT scores by State

State	Participation	Evidence-Based Rea...	Math	Total
Alabama	6%	595	571	1166
Alaska	43%	562	544	1106

2. 2018 ACT scores by State

State	Participation	Composite
Alabama	100%	19.1
Alaska	33%	20.8

3. 2018 Temperatures by State

state	avg_hum_spr	avg_hum_sum	avg_hum_fall	avg_hum_wint
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avg_temp_spr	avg_temp_sum	avg_temp_fall	avg_temp_wint
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avg_precip_spr	avg_precip_sum	avg_precip_fall	avg_precip_wint
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avg_pressure_spr	avg_pressure_sum	avg_pressure_fall	avg_pressure_wint
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Data preparation and merge

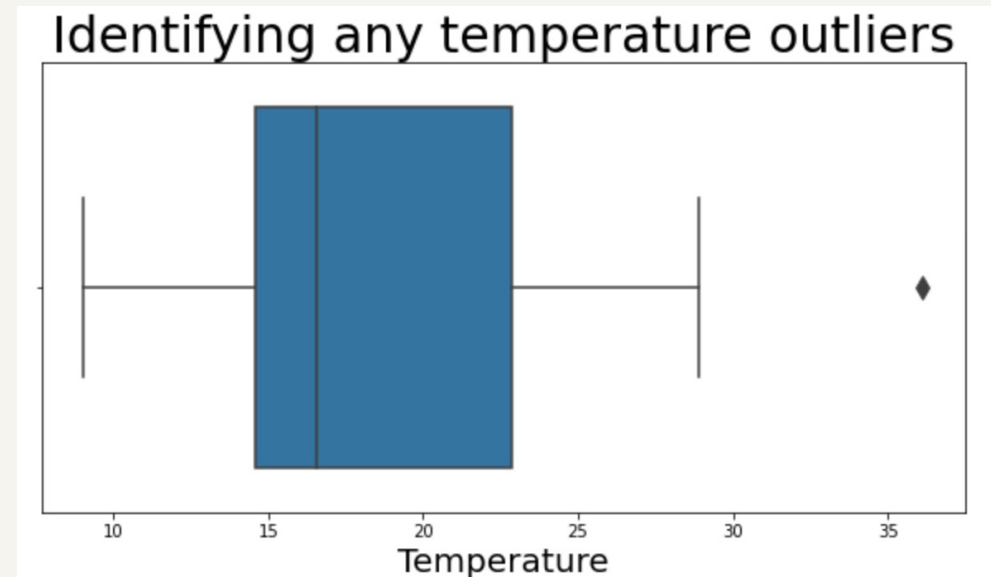
Goal: Make datasets suitable for study



Summary Statistics

Observations:

- ACT mean participation is 17.5% higher
 - STD is similar for both test scores
- Max. and min. scores are within their boundaries.



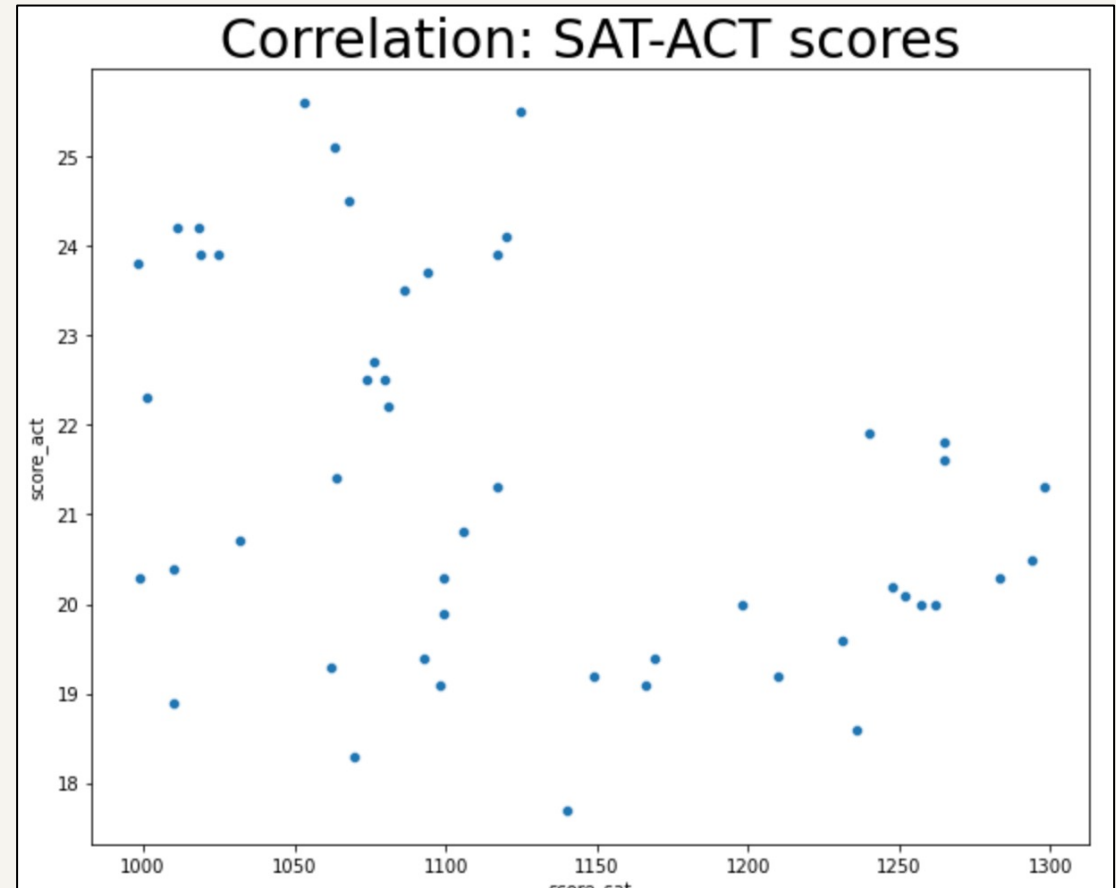
Correlation

Key insights:

	score_sat	participation_%_sat	score_act	participation_%_act	avg_temp
score_sat	1.000000	-0.770420	-0.376341	0.598675	-0.019780
participation_%_sat	-0.770420	1.000000	0.746531	-0.859521	-0.092106
score_act	-0.376341	0.746531	1.000000	-0.857155	-0.380861
participation_%_act	0.598675	-0.859521	-0.857155	1.000000	0.075502
avg_temp	-0.019780	-0.092106	-0.380861	0.075502	1.000000

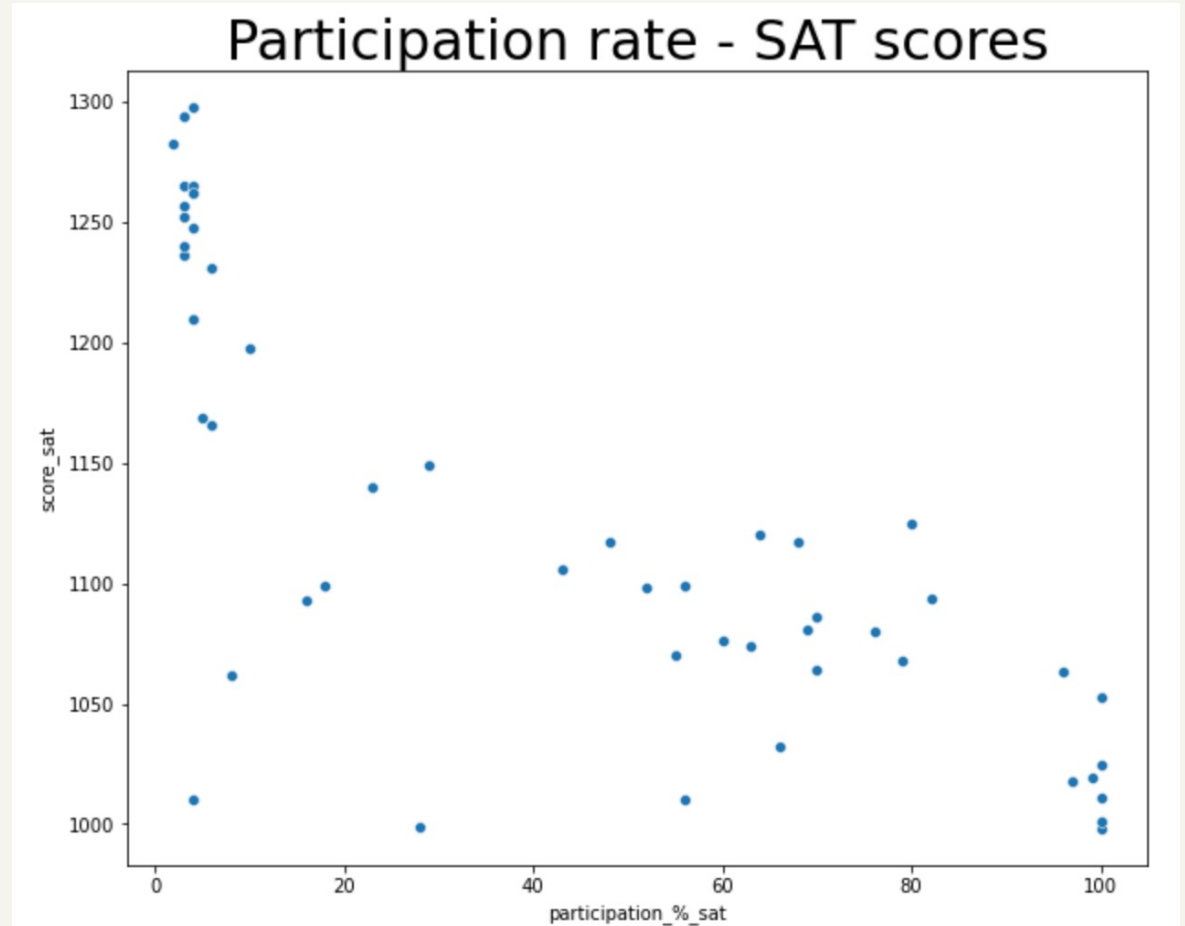
(+ / -)	Meaning
1	Perfect
0.75 - 1	Strong
0.5 - 0.75	Moderate
< 0.5	Weak

Correlation: SAT-ACT scores



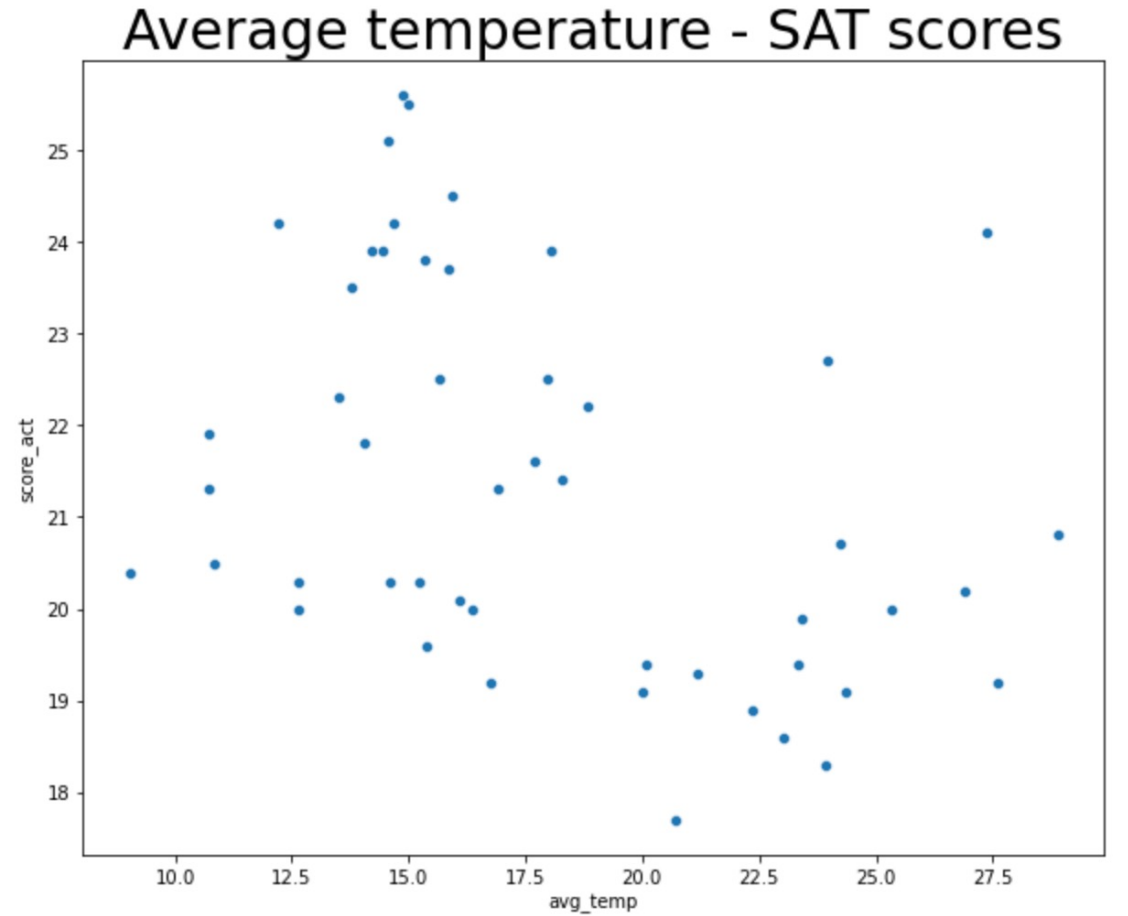
(-0.37: very weak)

Correlation: Participation - Scores



SAT: -0.77 (strong negative)
ACT: -0.86 (strong negative)

**Correlation:
State temp.
-
Scores**

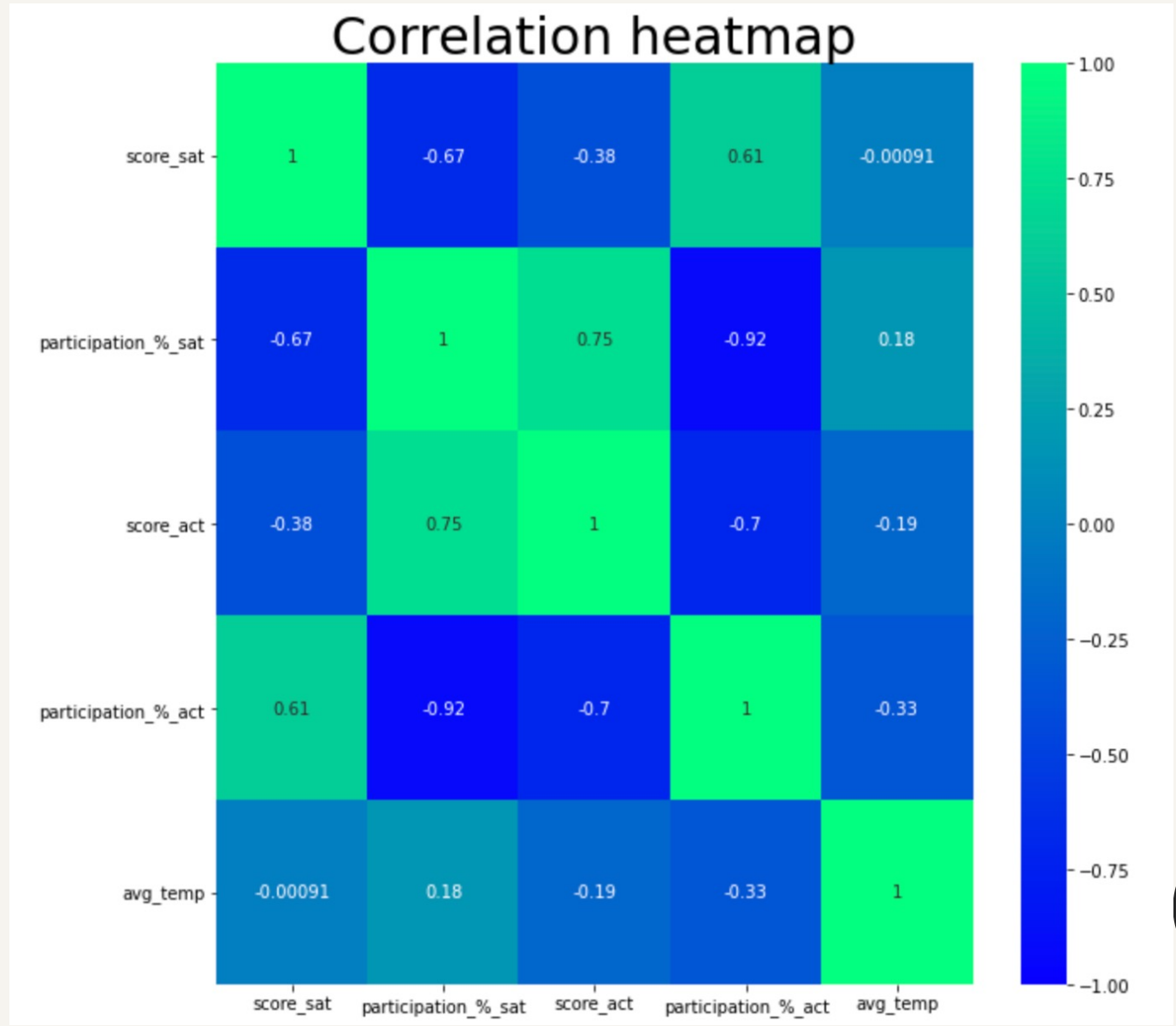


SAT: -0.02 (none)

ACT: -0.38 (weak negative)

**Correlation:
top / bottom
5 temp.**

No significant new insights



Conclusion

Does temperature affect test participation and scores?

NO evidence found.







