A Glance at the Differences between ACT and SAT Enrollment in America

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Methods and Tools

Jupyter Notebook : Numpy, Scipy, Matplotlib, Pandas, Seaborn

1. Data extraction and cleaning
    - Data sets as provided or from additional sources (see Reference Slide)
2. Data Exploration
    - Descriptive Statistics
3. Data Visualisation
    - Data distribution
    - Correlation plotting
4. Additional Research

Data Cleaning

- Data was imported using pandas from .csv
  - ```
    read_act_2017 = pd.read_csv('act_2017.csv')
    act_2017 = pd.DataFrame(read_act_2017)
    ```
- Data was then looked at descriptively
- Any erroneous values were spotted and cleaned
- Any inaccurate data type was changed
- ACT and SAT scores for 2017 and 2018 were then merged into a dataframe

```
act_2017.describe()
```

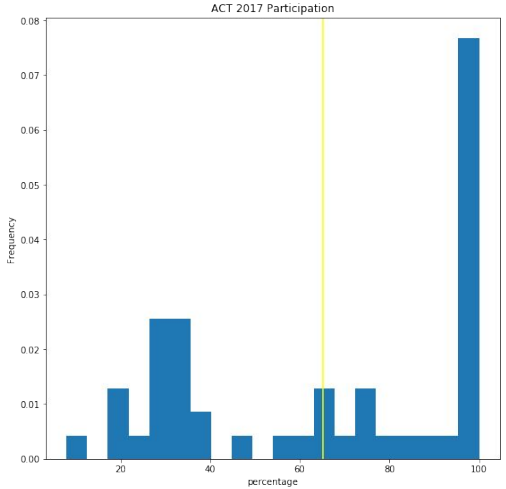
	English	Math	Reading	Science
count	52.000000	52.000000	52.000000	52.000000
mean	20.919231	21.173077	22.001923	21.040385
std	2.332132	1.963602	2.048672	3.151113
min	16.300000	18.000000	18.100000	2.300000
25%	19.000000	19.400000	20.475000	19.900000
50%	20.550000	20.900000	21.700000	21.150000
75%	23.300000	23.100000	24.125000	22.525000
max	25.500000	25.300000	26.000000	24.900000
```

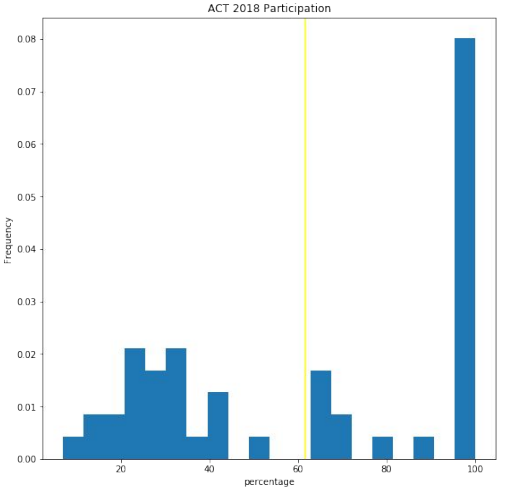
Data Visualisation

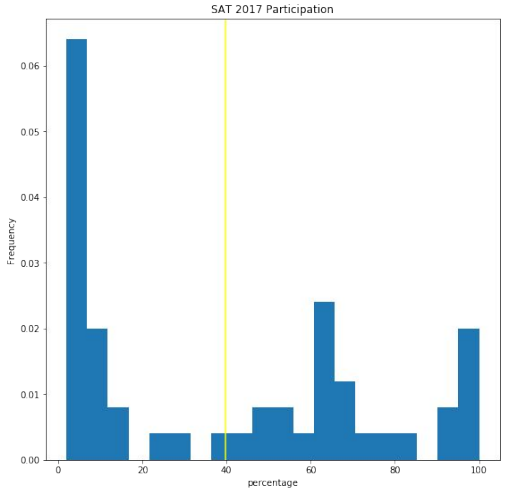
Histograms were used to visually determine if the data were normally distributed.

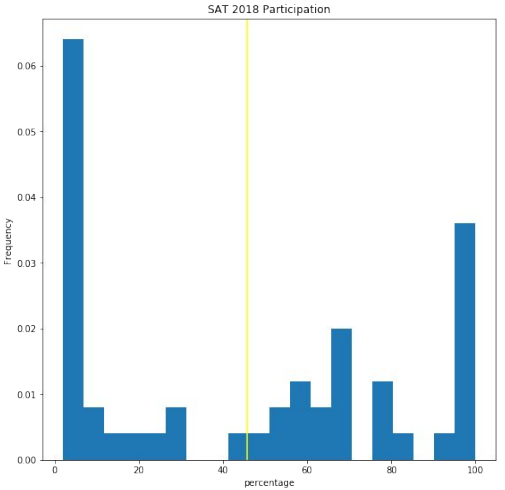
All numerical data was determined for non-normal distribution using Shapiro Wilks after.

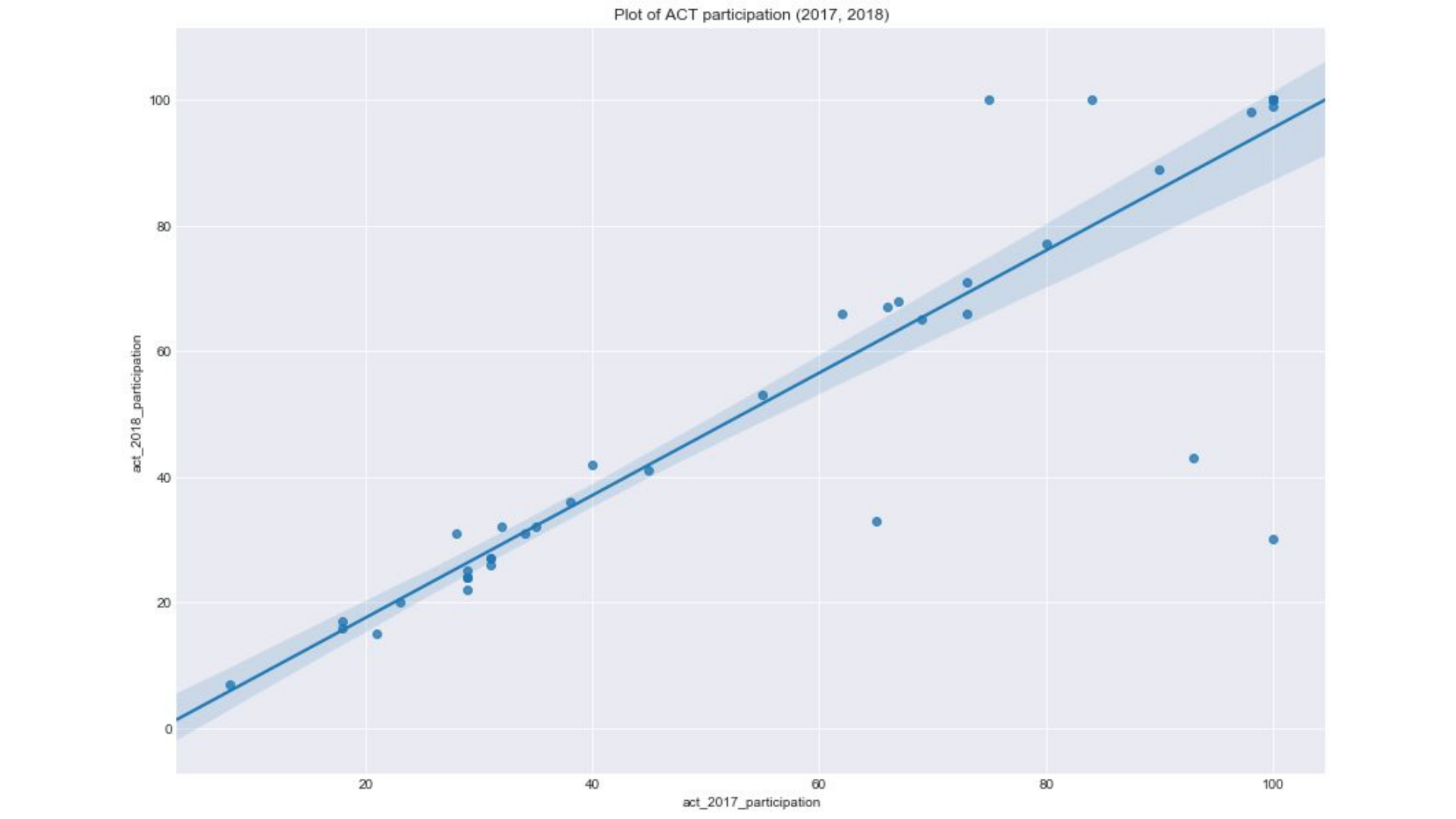
Only ACT 2017 Reading and Science were not significant for non-normal distribution.

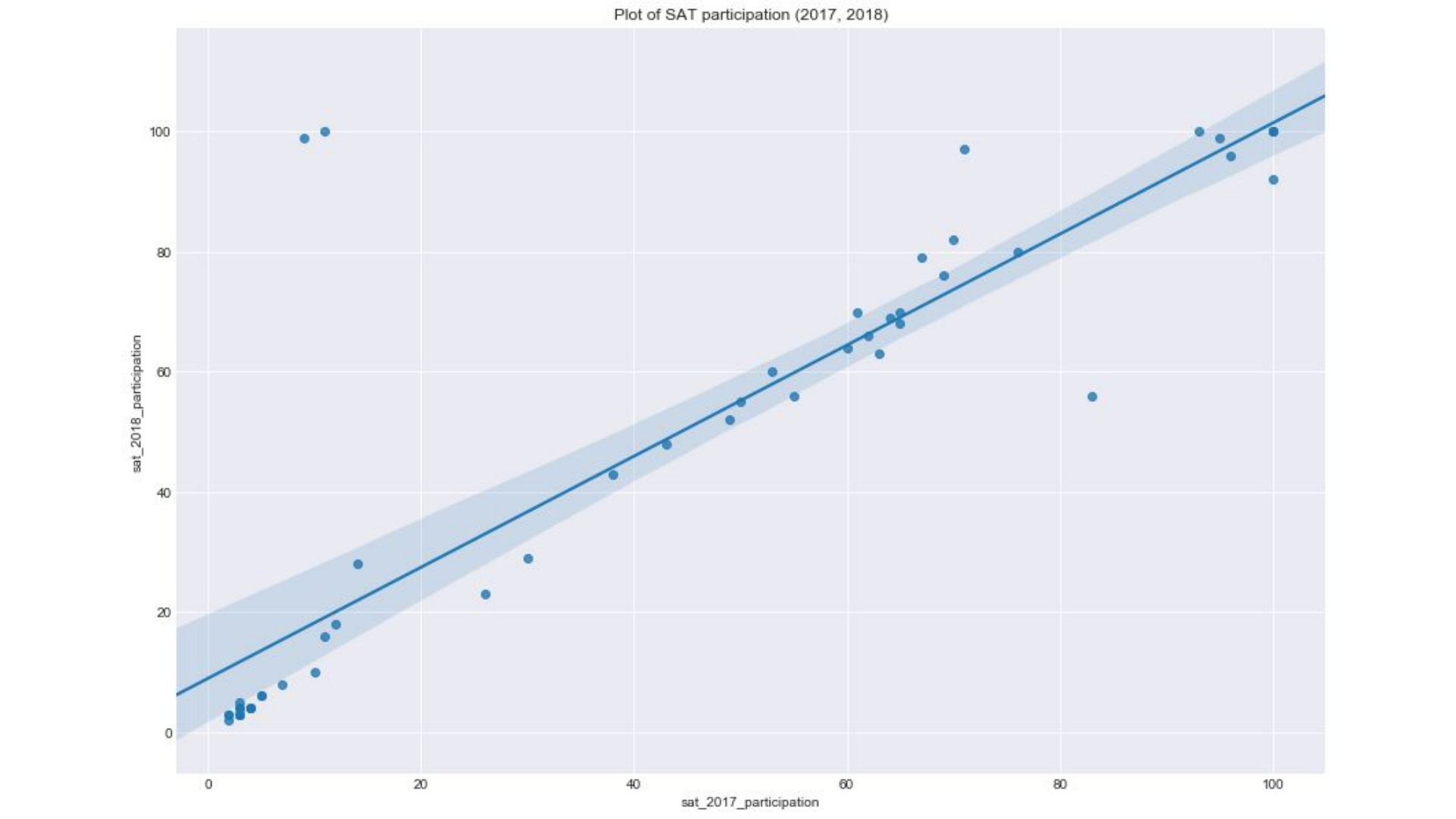






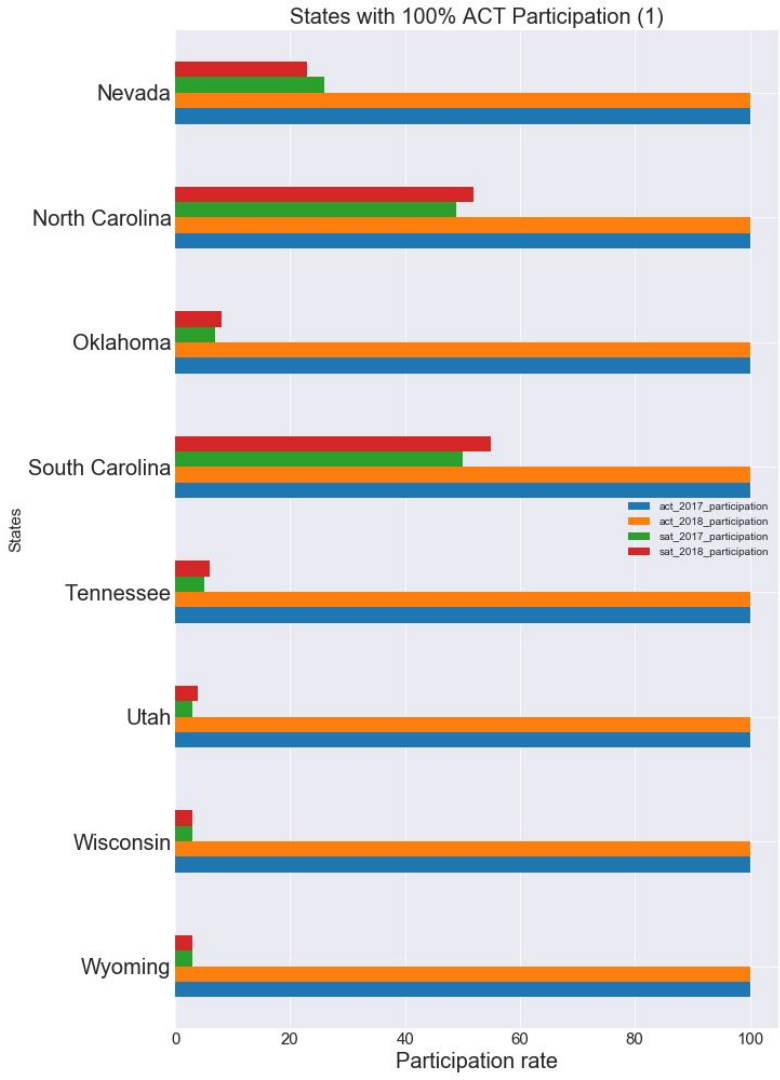


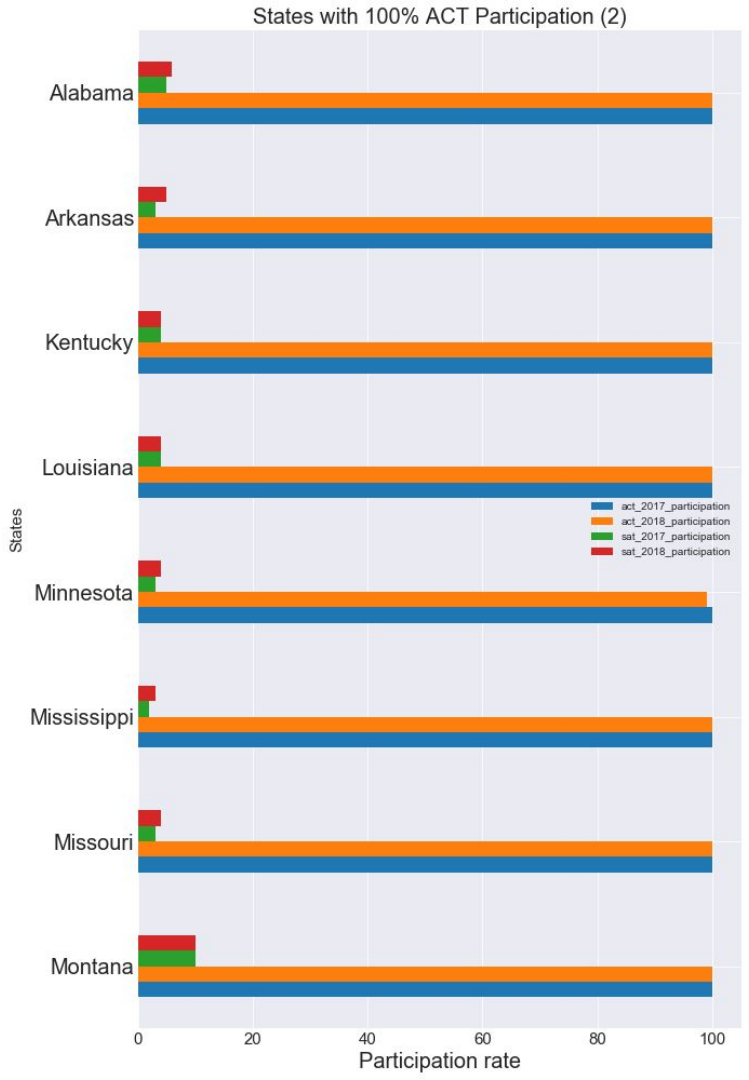

Plot of ACT participation (2017, 2018)
act_2018_participation
act_2017_participation
0
20
40
60
80
100
20
40
60
80
100

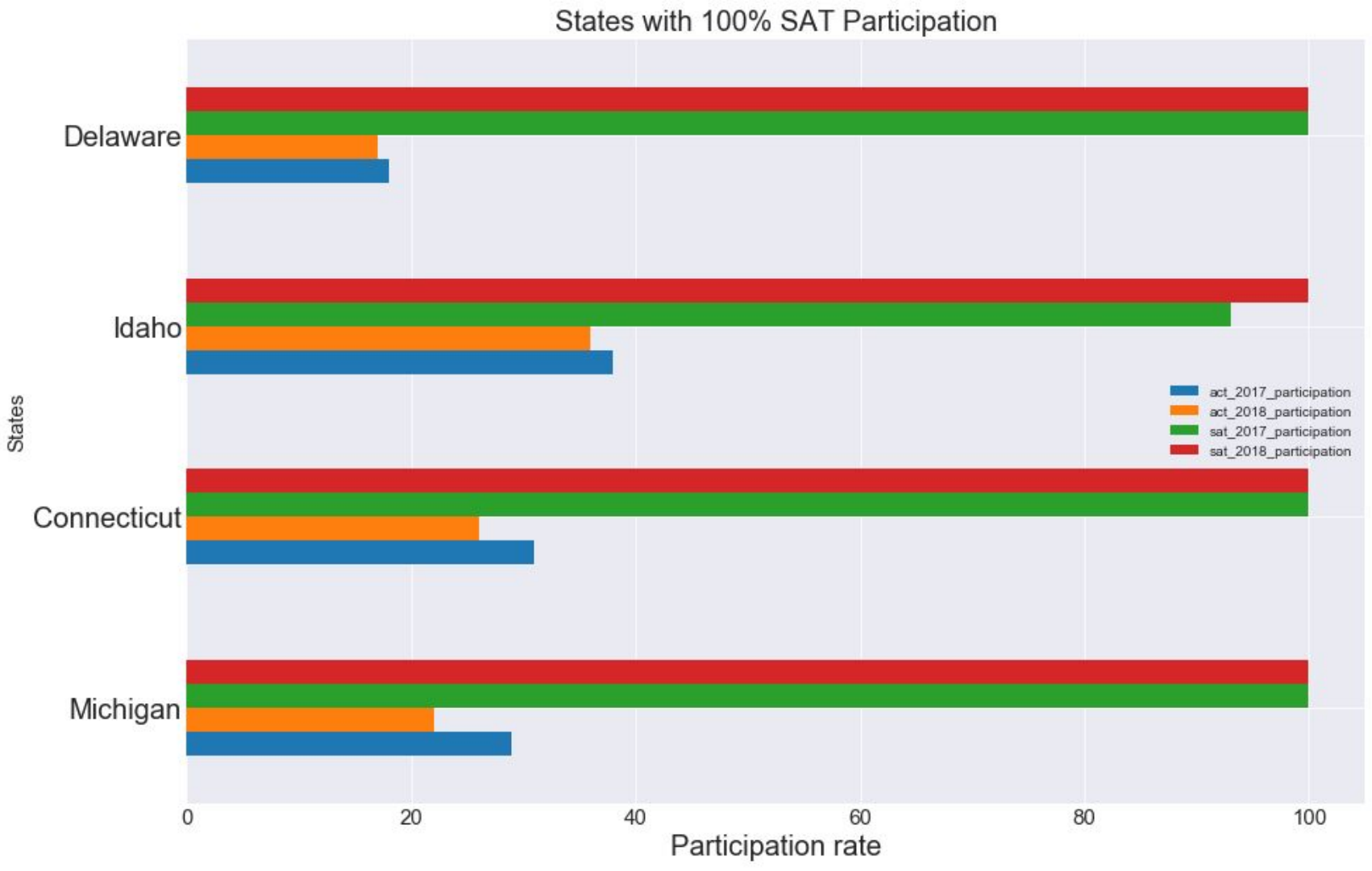

Plot of SAT participation (2017, 2018)
sat_2018_participation
sat_2017_participation
0
20
40
60
80
100

Data Visualisation (contd)

- Linear regression plots were used to look at the relationship with participation of 2017 and 2018.
  - Both plots showed an almost y = x gradient
  - However, the intercept for SAT participation is larger than that of ACT participation across the two years
    - Possible interpretation: There is a positive shift of students taking the SAT overall

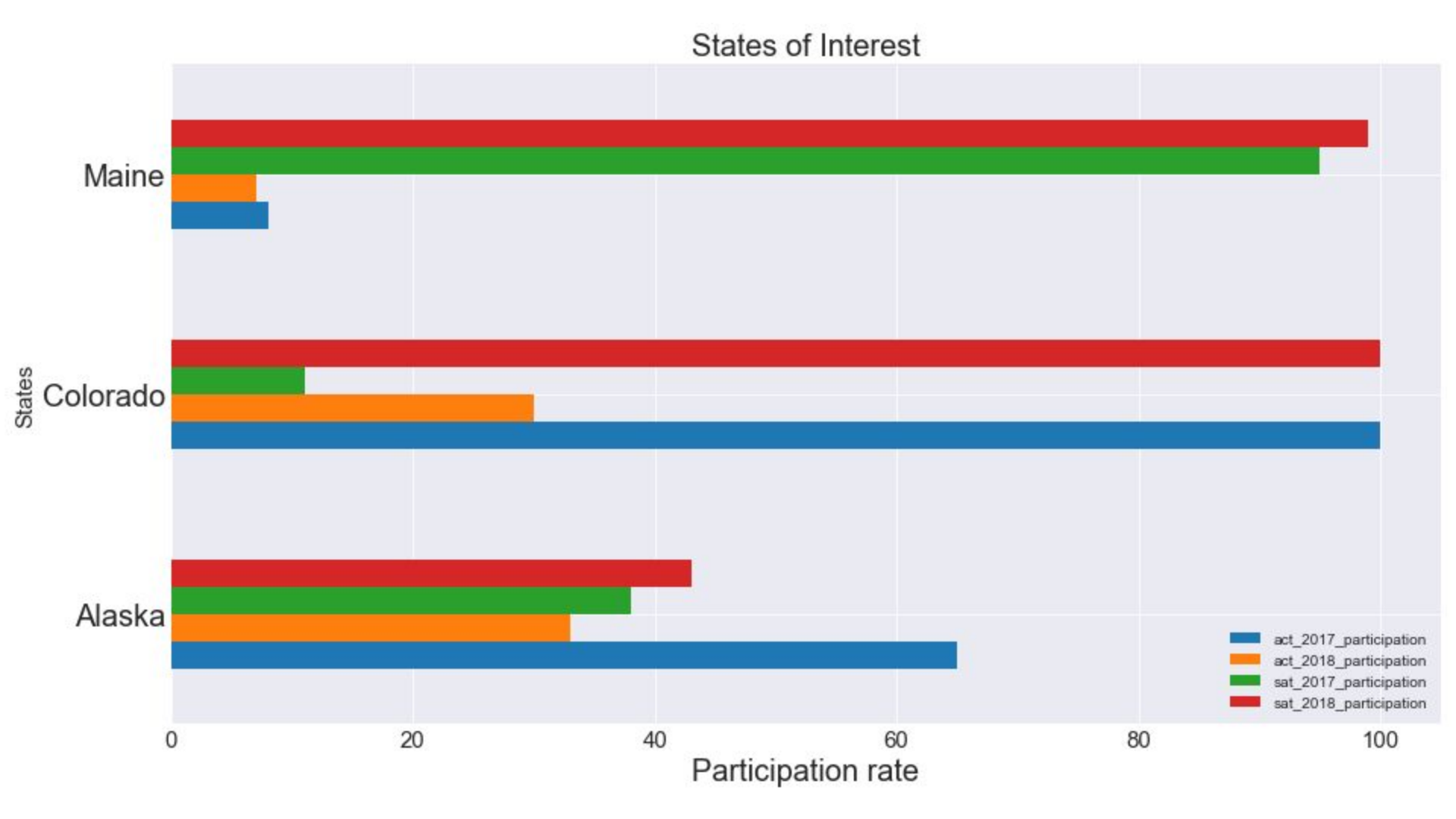

States with 100% ACT Participation (1)
Nevada
North Carolina
Oklahoma
South Carolina
Tennessee
Utah
Wisconsin
Wyoming
States
act_2017_participation
act_2018_participation
sat_2017_participation
sat_2018_participation
0
20
40
60
80
100
Participation rate


States with 100% ACT Participation (2)
Alabama
Arkansas
Kentucky
Louisiana
Minnesota
Mississippi
Missouri
Montana
States
act_2017_participation
act_2018_participation
sat_2017_participation
sat_2018_participation
0
20
40
60
80
100
Participation rate


States with 100% SAT Participation
Delaware
Idaho
Connecticut
Michigan
States
act_2017_participation
act_2018_participation
sat_2017_participation
sat_2018_participation
0
20
40
60
80
100
Participation rate

Data Visualisation (Contd)

- Visually, states that have 100% participation in a test, they are more likely to have lower than 50% participation in the other test


States of Interest
Maine
Colorado
Alaska
States
0
20
40
60
80
100
Participation rate
act_2017_participation
act_2018_participation
sat_2017_participation
sat_2018_participation

Points of Interest

- Colorado has a unique graph where it changed from 100% participation in ACT 2017 to 100% participation in SAT 2018.
  - This is because there was a change in high school testing in 2017 from ACT to SAT. (1)
- Alaska has a middling participation rate for both ACT and SAT.
  - This is because there is no state preferred test for Alaska. (2)
- Maine has a high SAT participation
  - This is because the state has requires SAT. (3)
  - However, Maine does not have 100% test participation in SAT
  - Possibility: They might not be in the public school system

(1) Source: "https://www.testive.com/colorado-sat-change-2017/"
(2) Source: " https://magoosh.com/hs/act/2017/states-that-require-the-act-or-sat/"
(3) Source: "https://magoosh.com/hs/act/2017/states-that-require-the-act-or-sat/"

Strategy for College Board

- There are less states participating fully in SATs as compared to ACTs
- It can be recommended that to improve participation rates, College Board can be encouraged to approach schools boards in states that do not have already require the SAT or ACT
  - E.G Oregon
    - Has consistently lower participation rates for both years for both tests
    - Possible Strategy:
      - To cooperate with the state to provide subsidised testing as Oregon does not have a preferred test and subsidised test seems to be a major indicator of choice.