

# **Black Obesity Rates in America Explained: Exploring Black obesity in America as a product of social and economic dynamics, through graphic vizualizations**

While we see the statistics, we don't split them by state. When we split them by state, we don't split them by race. When we split them by race, we don't split them by a social factor. When we split them by a social factor, we don't split them by an economic factor. I think you get the point.. there is always a story behind the numbers one sees at the surface. One set of statistics is always influenced by another set of statistics.

In this project, I aim to visually display the proportionality in being black and being obese in states around the country. I aim to do this by comparing black state obesity rates to white state obesity rates, white state obesity rates to average state obesity rates. Then, I will split Black state obesity rates and White state obesity rates by factors such that disproportionately harm Black people such as population, income inequality and incarceration rates.

In [40]:

```
import csv
import pylab
import matplotlib.pyplot as plt
import pandas as pd
import numpy as np

source = 'Workbook3.csv'
table = []
states = []

data = pd.read_csv(source)

print(data)
```

	State	Obesity	Black Obesity	Caucasian
0	Texas	32.4	39.8	30.1
1	California	24.2	31.4	23.1
2	Kentucky	34.6	40.2	34.4
3	Georgia	30.7	37.1	29.5
4	Wisconsin	30.7	38.1	31.0
5	Oregon	30.1	30.8	29.3
6	Virginia	29.2	41.0	27.9
7	Tennessee	33.8	46.4	31.8
8	Louisiana	36.2	42.6	33.4
9	New York	25.0	33.4	24.7
10	Michigan	31.2	39.9	30.9
11	Idaho	28.6	NaN	27.8
12	Florida	26.8	35.4	26.2
13	Alaska	29.8	44.7	30.0
14	Montana	23.6	NaN	24.0
15	Minnesota	26.1	30.4	27.5
16	Nebraska	31.4	39.9	31.7
17	Washington	26.4	33.7	28.3
18	Ohio	29.8	37.5	31.2
19	Illinois	30.8	39.5	30.3
20	Missouri	32.4	39.1	31.6
21	Iowa	32.1	33.6	36.3
22	South Dakota	30.4	20.0	30.0
23	Arkansas	34.5	44.2	34.0
24	Mississippi	35.6	45.4	37.1
25	Colorado	20.2	28.9	20.3
26	North Carolina	30.1	41.1	29.3
27	Utah	24.5	26.3	24.7
28	Oklahoma	33.9	37.6	33.4
29	Wyoming	29.0	43.3	27.9
30	West Virginia	35.6	43.6	37.0
31	Indiana	31.3	42.2	32.1
32	Massachusetts	24.3	35.1	24.0
33	Nevada	26.7	29.2	25.7
34	Connecticut	25.3	37.1	24.4
35	District of Columbia	22.1	36.2	10.4
36	Rhode Island	26.0	31.8	26.9
37	Alabama	35.6	45.0	33.1
38	South Carolina	31.7	42.0	29.6
39	Maine	30.0	24.8	29.8
40	Hawaii	22.7	29.8	17.5
41	Arizona	28.4	32.4	26.1
42	New Mexico	28.8	31.2	24.3
43	Maryland	28.9	39.1	28.1
44	Delaware	29.7	37.4	29.7
45	Pennsylvania	30.0	36.8	30.1
46	Kansas	34.2	41.2	32.0
47	Vermont	25.1	22.8	26.7
48	New Jersey	25.6	36.4	25.7
49	North Dakota	31.0	19.6	31.9
50	New Hampshire	26.3	25.9	27.4

In [49]:

```
df = pd.DataFrame(data)
```

In [50]:

```
print(df)
```

	State	Obesity	Black Obesity	Caucasian
0	Texas	32.4	39.8	30.1
1	California	24.2	31.4	23.1
2	Kentucky	34.6	40.2	34.4
3	Georgia	30.7	37.1	29.5
4	Wisconsin	30.7	38.1	31.0
5	Oregon	30.1	30.8	29.3
6	Virginia	29.2	41.0	27.9
7	Tennessee	33.8	46.4	31.8
8	Louisiana	36.2	42.6	33.4
9	New York	25.0	33.4	24.7
10	Michigan	31.2	39.9	30.9
11	Idaho	28.6	NaN	27.8
12	Florida	26.8	35.4	26.2
13	Alaska	29.8	44.7	30.0
14	Montana	23.6	NaN	24.0
15	Minnesota	26.1	30.4	27.5
16	Nebraska	31.4	39.9	31.7
17	Washington	26.4	33.7	28.3
18	Ohio	29.8	37.5	31.2
19	Illinois	30.8	39.5	30.3
20	Missouri	32.4	39.1	31.6
21	Iowa	32.1	33.6	36.3
22	South Dakota	30.4	20.0	30.0
23	Arkansas	34.5	44.2	34.0
24	Mississippi	35.6	45.4	37.1
25	Colorado	20.2	28.9	20.3
26	North Carolina	30.1	41.1	29.3
27	Utah	24.5	26.3	24.7
28	Oklahoma	33.9	37.6	33.4
29	Wyoming	29.0	43.3	27.9
30	West Virginia	35.6	43.6	37.0
31	Indiana	31.3	42.2	32.1
32	Massachusetts	24.3	35.1	24.0
33	Nevada	26.7	29.2	25.7
34	Connecticut	25.3	37.1	24.4
35	District of Columbia	22.1	36.2	10.4
36	Rhode Island	26.0	31.8	26.9
37	Alabama	35.6	45.0	33.1
38	South Carolina	31.7	42.0	29.6
39	Maine	30.0	24.8	29.8
40	Hawaii	22.7	29.8	17.5
41	Arizona	28.4	32.4	26.1
42	New Mexico	28.8	31.2	24.3
43	Maryland	28.9	39.1	28.1
44	Delaware	29.7	37.4	29.7
45	Pennsylvania	30.0	36.8	30.1
46	Kansas	34.2	41.2	32.0
47	Vermont	25.1	22.8	26.7
48	New Jersey	25.6	36.4	25.7
49	North Dakota	31.0	19.6	31.9
50	New Hampshire	26.3	25.9	27.4

In [17]:

```
data["Black Obesity"]
```

Out[17]:

0	39.8
1	31.4
2	40.2
3	37.1
4	38.1
5	30.8
6	41.0
7	46.4
8	42.6
9	33.4
10	39.9
11	NaN
12	35.4
13	44.7
14	NaN
15	30.4
16	39.9
17	33.7
18	37.5
19	39.5
20	39.1
21	33.6
22	20.0
23	44.2
24	45.4
25	28.9
26	41.1
27	26.3
28	37.6
29	43.3
30	43.6
31	42.2
32	35.1
33	29.2
34	37.1
35	36.2
36	31.8
37	45.0
38	42.0
39	24.8
40	29.8
41	32.4
42	31.2
43	39.1
44	37.4
45	36.8
46	41.2
47	22.8
48	36.4
49	19.6
50	25.9

Name: Black Obesity, dtype: float64

In [18]:

```
data["Obesity"]
```

Out[18]:

0	32.4
1	24.2
2	34.6
3	30.7
4	30.7
5	30.1
6	29.2
7	33.8
8	36.2
9	25.0
10	31.2
11	28.6
12	26.8
13	29.8
14	23.6
15	26.1
16	31.4
17	26.4
18	29.8
19	30.8
20	32.4
21	32.1
22	30.4
23	34.5
24	35.6
25	20.2
26	30.1
27	24.5
28	33.9
29	29.0
30	35.6
31	31.3
32	24.3
33	26.7
34	25.3
35	22.1
36	26.0
37	35.6
38	31.7
39	30.0
40	22.7
41	28.4
42	28.8
43	28.9
44	29.7
45	30.0
46	34.2
47	25.1
48	25.6
49	31.0
50	26.3

Name: Obesity, dtype: float64

In [19]:

```
data["Caucasian"]
```

Out[19]:

0	30.1
1	23.1
2	34.4
3	29.5
4	31.0
5	29.3
6	27.9
7	31.8
8	33.4
9	24.7
10	30.9
11	27.8
12	26.2
13	30.0
14	24.0
15	27.5
16	31.7
17	28.3
18	31.2
19	30.3
20	31.6
21	36.3
22	30.0
23	34.0
24	37.1
25	20.3
26	29.3
27	24.7
28	33.4
29	27.9
30	37.0
31	32.1
32	24.0
33	25.7
34	24.4
35	10.4
36	26.9
37	33.1
38	29.6
39	29.8
40	17.5
41	26.1
42	24.3
43	28.1
44	29.7
45	30.1
46	32.0
47	26.7
48	25.7
49	31.9
50	27.4

Name: Caucasian, dtype: float64

## GRAPH #1: BLACK OBESITY RATE BY STATE VS AVG OBESITY RATE BY STATE

In [20]:

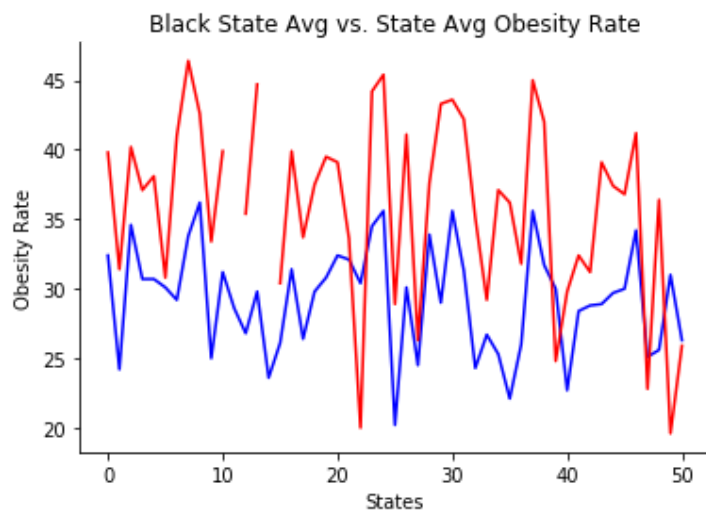
```
fix, ax = plt.subplots()

ax.plot(data.index, data["Obesity"], color = "b")
ax.plot(data.index, data["Black Obesity"], color = "r")

ax.set_title("Black State Avg vs. State Avg Obesity Rate")

ax.spines["top"].set_visible(False)
ax.spines["right"].set_visible(False)
plt.xlabel('States')
plt.ylabel('Obesity Rate')

plt.show()
```



As one can conclude from the graph, the black obesity rate per state is generally larger than the state's average obesity rate, indicating that Blacks are definitely more obese than any other population.

## GRAPH #2: WHITE OBESITY RATE BY STATE VS AVG OBESITY RATE BY STATE



In [21]:

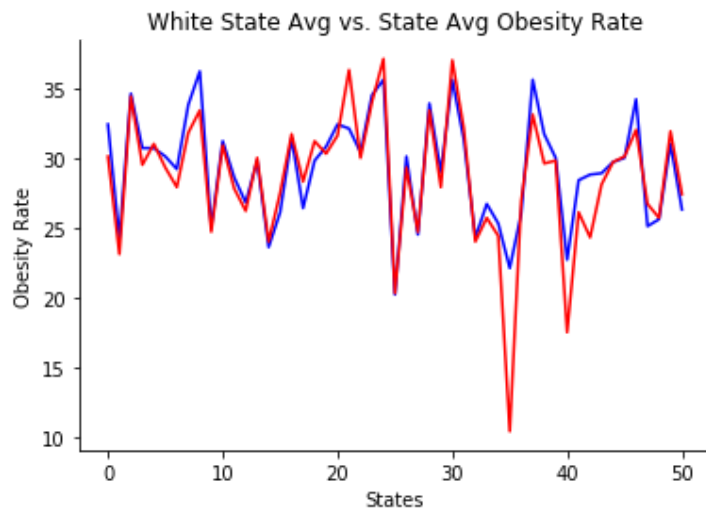
```
fix, ax = plt.subplots()

ax.plot(data.index, data["Obesity"], color = "b")
ax.plot(data.index, data["Caucasian"], color = "r")

ax.set_title("White State Avg vs. State Avg Obesity Rate")

ax.spines["top"].set_visible(False)
ax.spines["right"].set_visible(False)
plt.xlabel('States')
plt.ylabel('Obesity Rate')

plt.show()
```



White obesity rates are more in line with the average state obesity rate.

## GRAPH #3: WHITE OBESITY RATE BY STATE VS BLACK OBESITY RATE BY STATE

In [22]:

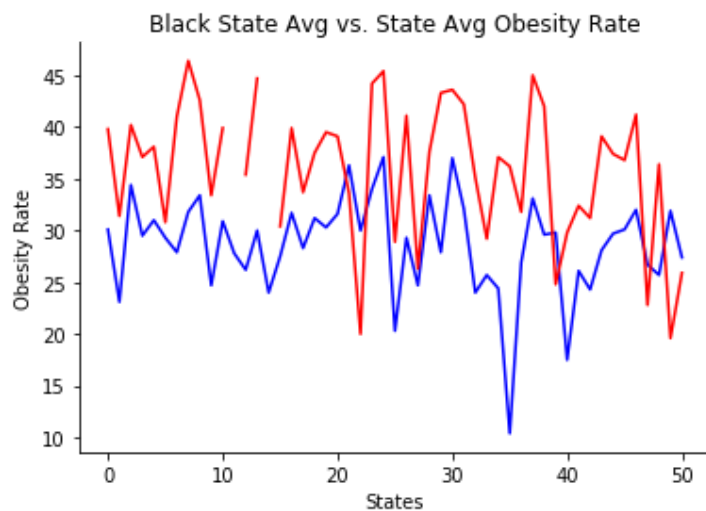
```
fix, ax = plt.subplots()

ax.plot(data.index, data["Caucasian"], color = "b")
ax.plot(data.index, data["Black Obesity"], color = "r")

ax.set_title("Black State Avg vs. State Avg Obesity Rate")

ax.spines["top"].set_visible(False)
ax.spines["right"].set_visible(False)
plt.xlabel('States')
plt.ylabel('Obesity Rate')

plt.show()
```



It can quickly be noted that the state averages for Black obesity are a lot higher than the state averages for White obesity.

## GRAPH #4: WHITE OBESITY RATE BY STATE VS BLACK OBESITY RATE BY STATE VS AVG STATE OBESITY RATE

In [24]:

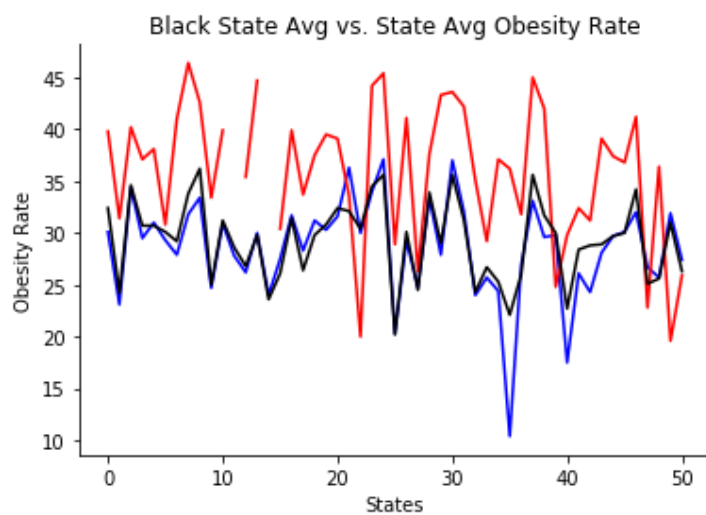
```
fix, ax = plt.subplots()

ax.plot(data.index, data["Caucasian"], color = "b")
ax.plot(data.index, data["Black Obesity"], color = "r")
ax.plot(data.index, data["Obesity"], color = "black")

ax.set_title("Black State Avg vs. State Avg Obesity Rate")

ax.spines["top"].set_visible(False)
ax.spines["right"].set_visible(False)
plt.xlabel('States')
plt.ylabel('Obesity Rate')

plt.show()
```



In [52]:

```
print(df["State"])
```

```
0          Texas
1    California
2      Kentucky
3       Georgia
4    Wisconsin
5       Oregon
6     Virginia
7    Tennessee
8    Louisiana
9     New York
10    Michigan
11     Idaho
12    Florida
13     Alaska
14    Montana
15    Minnesota
16    Nebraska
17    Washington
18     Ohio
19    Illinois
20    Missouri
21     Iowa
22    South Dakota
23    Arkansas
24    Mississippi
25    Colorado
26    North Carolina
27     Utah
28    Oklahoma
29    Wyoming
30    West Virginia
31    Indiana
32    Massachusetts
33     Nevada
34    Connecticut
35    District of Columbia
36    Rhode Island
37    Alabama
38    South Carolina
39     Maine
40    Hawaii
41    Arizona
42    New Mexico
43    Maryland
44    Delaware
45    Pennsylvania
46    Kansas
47    Vermont
48    New Jersey
49    North Dakota
50    New Hampshire
Name: State, dtype: object
```

In [174]:

```
df.loc[[35,24,8,3,43,38,37,26,44,6, 47,39,50,21,11,29,15, 49, 22 ], ['State', 'Caucasian', 'Black Obesity']]
```

Out[174]:

	State	Caucasian	Black Obesity
35	District of Columbia	10.4	36.2
24	Mississippi	37.1	45.4
8	Louisiana	33.4	42.6
3	Georgia	29.5	37.1
43	Maryland	28.1	39.1
38	South Carolina	29.6	42.0
37	Alabama	33.1	45.0
26	North Carolina	29.3	41.1
44	Delaware	29.7	37.4
6	Virginia	27.9	41.0
47	Vermont	26.7	22.8
39	Maine	29.8	24.8
50	New Hampshire	27.4	25.9
21	Iowa	36.3	33.6
11	Idaho	27.8	NaN
29	Wyoming	27.9	43.3
15	Minnesota	27.5	30.4
49	North Dakota	31.9	19.6
22	South Dakota	30.0	20.0

In [175]:

```
df_2 = df.loc[[35,24,8,3,43,38,37,26,44,6, 47,39,50,21,11,29,15, 49, 22 ], ['State', 'Caucasian', 'Black Obesity']]
```

In [176]:

```
print(df_2)
```

	State	Caucasian	Black	Obesity
35	District of Columbia	10.4		36.2
24	Mississippi	37.1		45.4
8	Louisiana	33.4		42.6
3	Georgia	29.5		37.1
43	Maryland	28.1		39.1
38	South Carolina	29.6		42.0
37	Alabama	33.1		45.0
26	North Carolina	29.3		41.1
44	Delaware	29.7		37.4
6	Virginia	27.9		41.0
47	Vermont	26.7		22.8
39	Maine	29.8		24.8
50	New Hampshire	27.4		25.9
21	Iowa	36.3		33.6
11	Idaho	27.8		NaN
29	Wyoming	27.9		43.3
15	Minnesota	27.5		30.4
49	North Dakota	31.9		19.6
22	South Dakota	30.0		20.0

In [213]:

```
def plot(df_2, x_dim, y_dim, z_dim):

    x = df_2[x_dim]
    y = df_2[y_dim]
    z = df_2[z_dim]

    colors=["red", "#00FF00"]

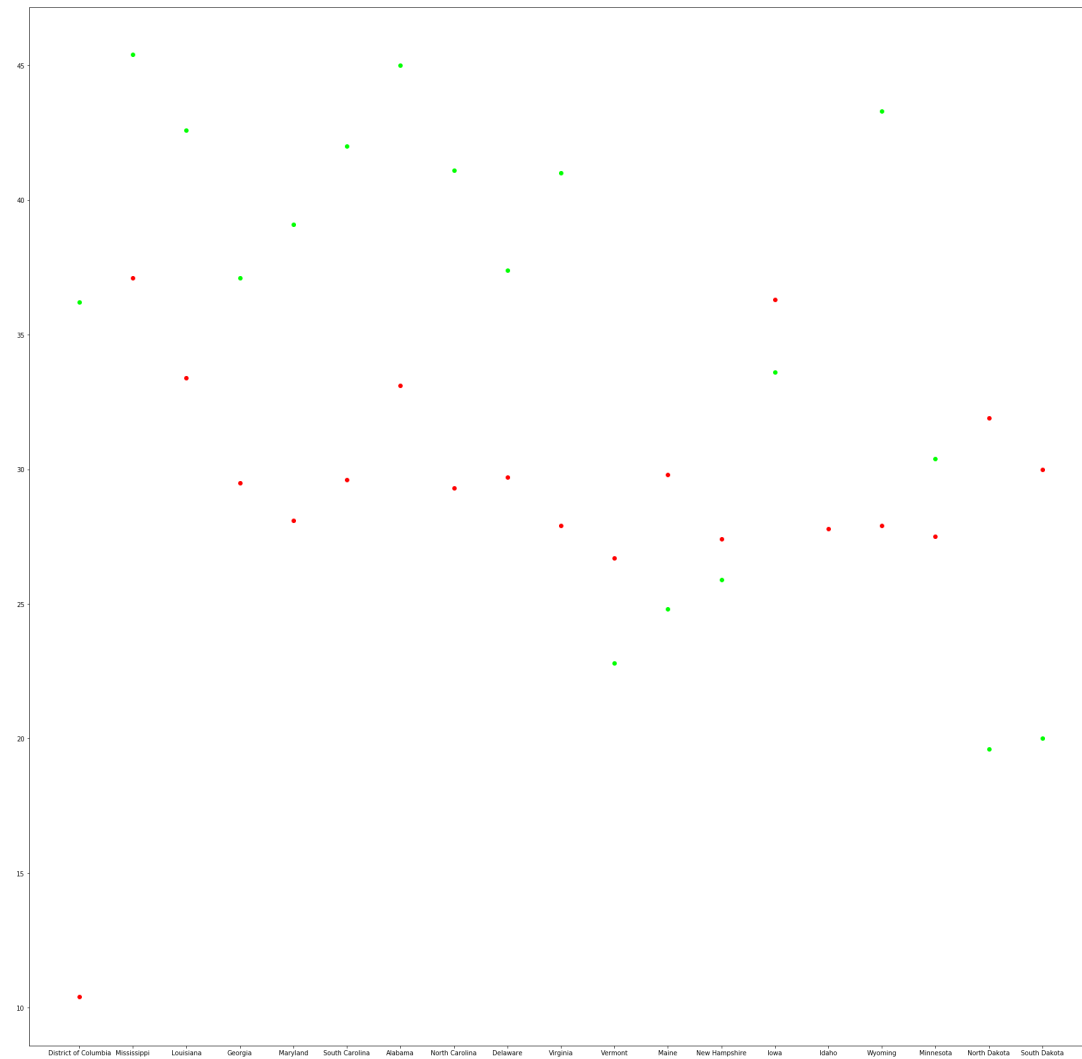
    fig, ax = plt.subplots(figsize=(30,30))
    ax.scatter(x,y, color=colors[1])
    ax.scatter(x,z, color=colors[0])

    plt.show()
```

## GRAPH #5: WHITE OBESITY RATE BY STATE VS BLACK OBESITY RATE BY STATE, IN THE STATES WITH THE TOP BLACK POPULATIONS & THE STATES WITH THE MOST WHITE POPULATIONS

In [214]:

```
plot(df_2, 'State', 'Black Obesity', 'Caucasian')
```



For this graph, I chose to visualize Black & white the obesity rates for the 10 states with the most Blacks & the 10 states with the most Whites. Black obesity rates from the 10 "Blackest" states (green) such as DC charted the highest on this scatterplot.

In [218]:

```
df.loc[[9,34,8,1,12 ], [ 'State', 'Caucasian', 'Black Obesity' ]]
```

Out[218]:

	State	Caucasian	Black Obesity
9	New York	24.7	33.4
34	Connecticut	24.4	37.1
8	Louisiana	33.4	42.6
1	California	23.1	31.4
12	Florida	26.2	35.4

In [219]:

```
df_3 = df.loc[[9,34,8,1,12 ], [ 'State', 'Caucasian', 'Black Obesity' ]]
```

In [225]:

```
def plot(df_3, x_dim, y_dim, z_dim):

    x = df_3[x_dim]
    y = df_3[y_dim]
    z = df_3[z_dim]

    colors=[ "red", "#00FF00" ]

    fig, ax = plt.subplots(figsize=(9,9))
    ax.scatter(x,y, color=colors[1])
    ax.scatter(x,z, color=colors[0])

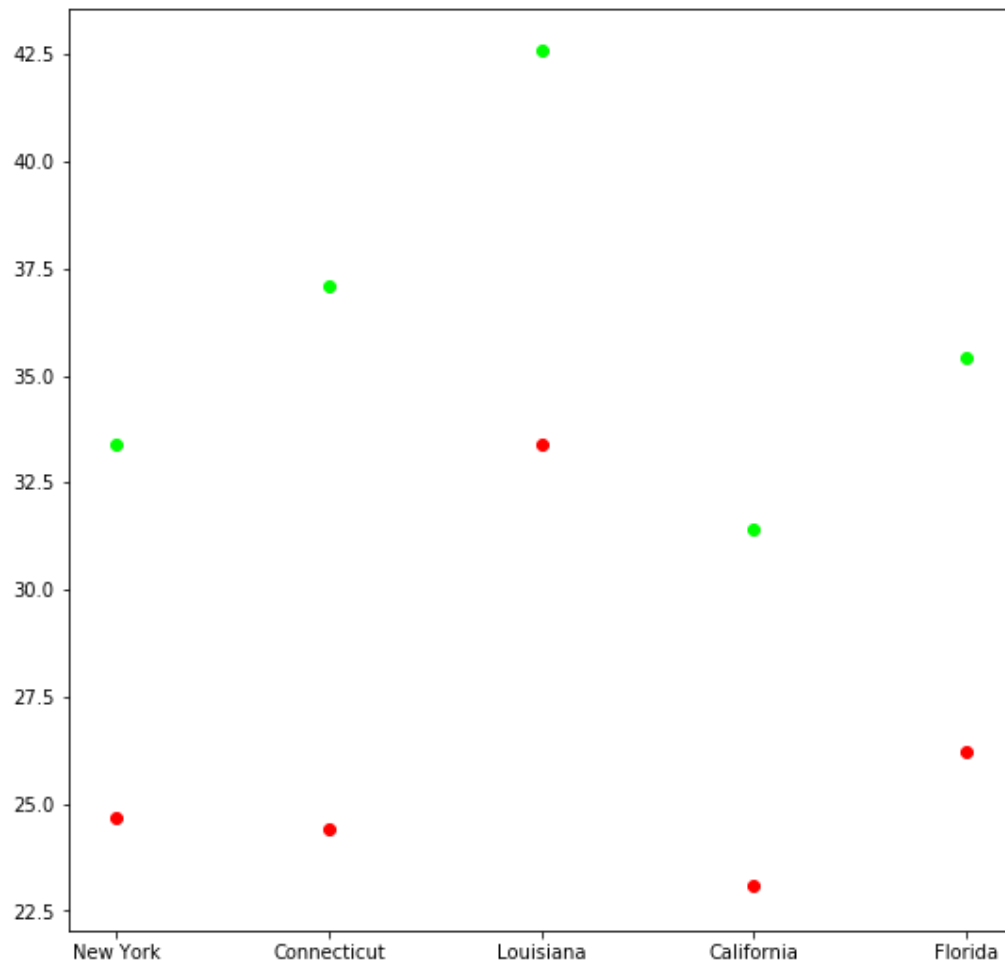
    plt.show()
```

## GRAPH #6: WHITE OBESITY RATE BY STATE VS BLACK OBESITY RATE BY STATE, BY INCOME GAP



In [226]:

```
plot(df_3, 'State', 'Black Obesity', 'Caucasian')
```



In this graph, I chose to compare Black and White obesity rates in the top 5 states with the highest income gap. Blacks, who are at the wrong side of the gap in all of these states, have significantly higher obesity rates than Whites, who are near the top of the income ranking. This implies that because Blacks do not earn a lot of income, they are subject to poor diets, which lead to obesity. This can also imply that blacks are subject to lifestyles that are unhealthy and also earn them a little bit of money.

In [227]:

```
df_4 = df.loc[[0,20,41,24,23,37], ['State', 'Caucasian', 'Black Obesity']]
```

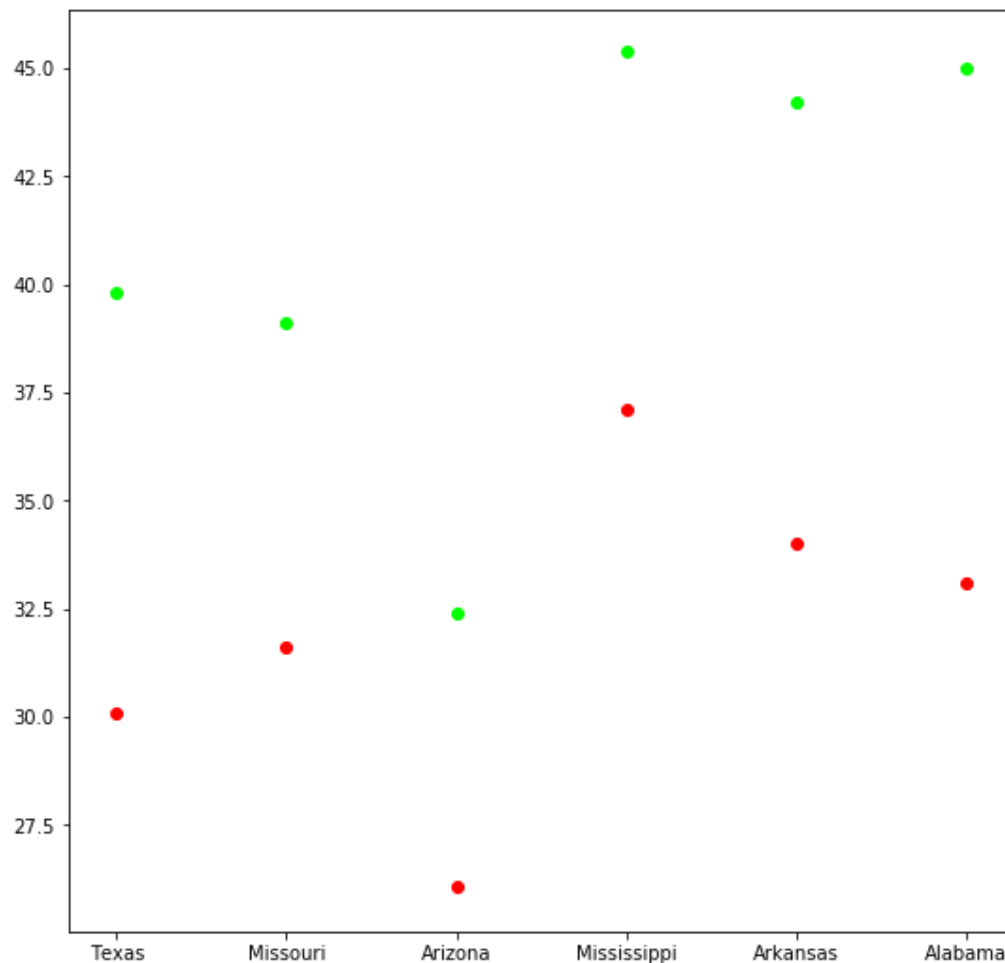
In [228]:

```
def plot(df_4, x_dim, y_dim, z_dim):  
  
    x = df_4[x_dim]  
    y = df_4[y_dim]  
    z = df_4[z_dim]  
  
    colors=["red", "#00FF00"]  
  
    fig, ax = plt.subplots(figsize=(9,9))  
    ax.scatter(x,y, color=colors[1])  
    ax.scatter(x,z, color=colors[0])  
  
    plt.show()
```

## GRAPH #7: WHITE OBESITY RATE BY STATE VS BLACK OBESITY RATE BY STATE, BY INCOME GAP

In [229]:

```
plot(df_4, 'State', 'Black Obesity', 'Caucasian')
```



In this graph, I chose to compare Black obesity rates vs White obesity rates in states where there are the highest levels of incarceration present. Of course, mass incarceration in America disproportionately affects Black people. The 5 states with the highest levels of mass incarceration show a large disparity between Black obesity (green) and White obesity. This implies that obesity is also a function of social immobility. When you are incarcerated and then you come out, you are confined to a "corner" of society in that you are (for the most part) denied opportunities to educate yourself and get a job. Someone being left with that little of options will almost certainly fall prey to a common epidemic such as obesity, simply because they don't know any better and/or cannot afford a better life.

## Conclusion:

The conclusion is, when you split state obesity data by race, Black obesity rates are higher than White obesity rates. Additionally, when you split state obesity data by social factors such as incarceration rates and income inequality rates, Black obesity rates are higher than White obesity rates.

The ultimate point is, the obesity epidemic that disproportionately affects Black people in America is no mere coincidence, and can be explained by socioeconomic factors that are marring Black communities across the country. Thus, to tackle obesity, one must not start with a simple nutritional education, but to tackle other fundamental areas where Blacks are struggling, for a decrease in obesity will follow.

In [ ]: