

# Exploratory Data Analysis of Officer Traffic Stops

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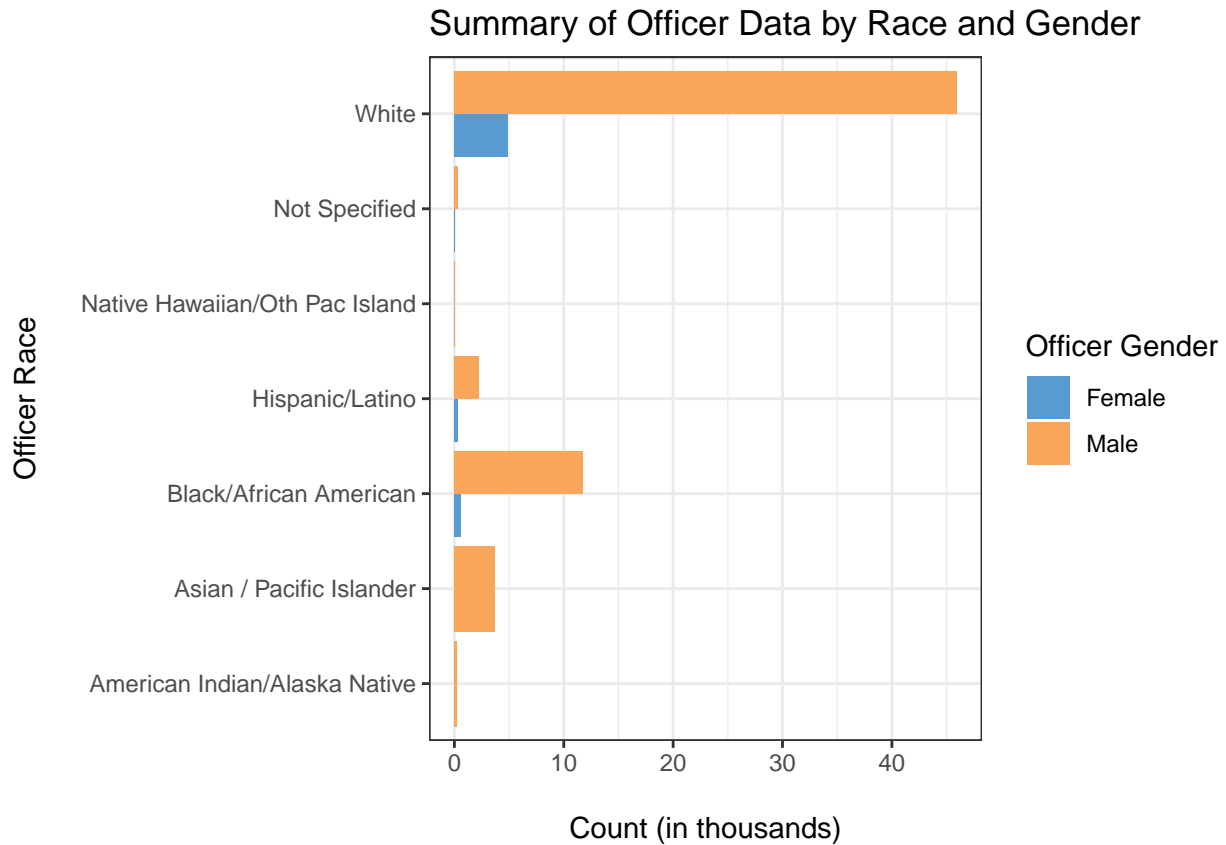
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On a first glance at the data, we can see that this data covers traffic stops by police officers in Charlotte, North Carolina over the year 2016. Let's explore first the race, gender and years of service of officers.

Table 1: Summary of Officer Data

Officer Race	Officer Gender	Count
White	Male	45,939
Black/African American	Male	11,708
White	Female	4,861
Asian / Pacific Islander	Male	3,731
Hispanic/Latino	Male	2,198
Black/African American	Female	606
Not Specified	Male	338
Hispanic/Latino	Female	321
American Indian/Alaska Native	Male	221
Not Specified	Female	90
Native Hawaiian/Oth Pac Island	Male	62

We omit the NAs in the data, because we can see that there are 261 NAs in the data. Also, there are unspecified data for officer races of 460 officers.

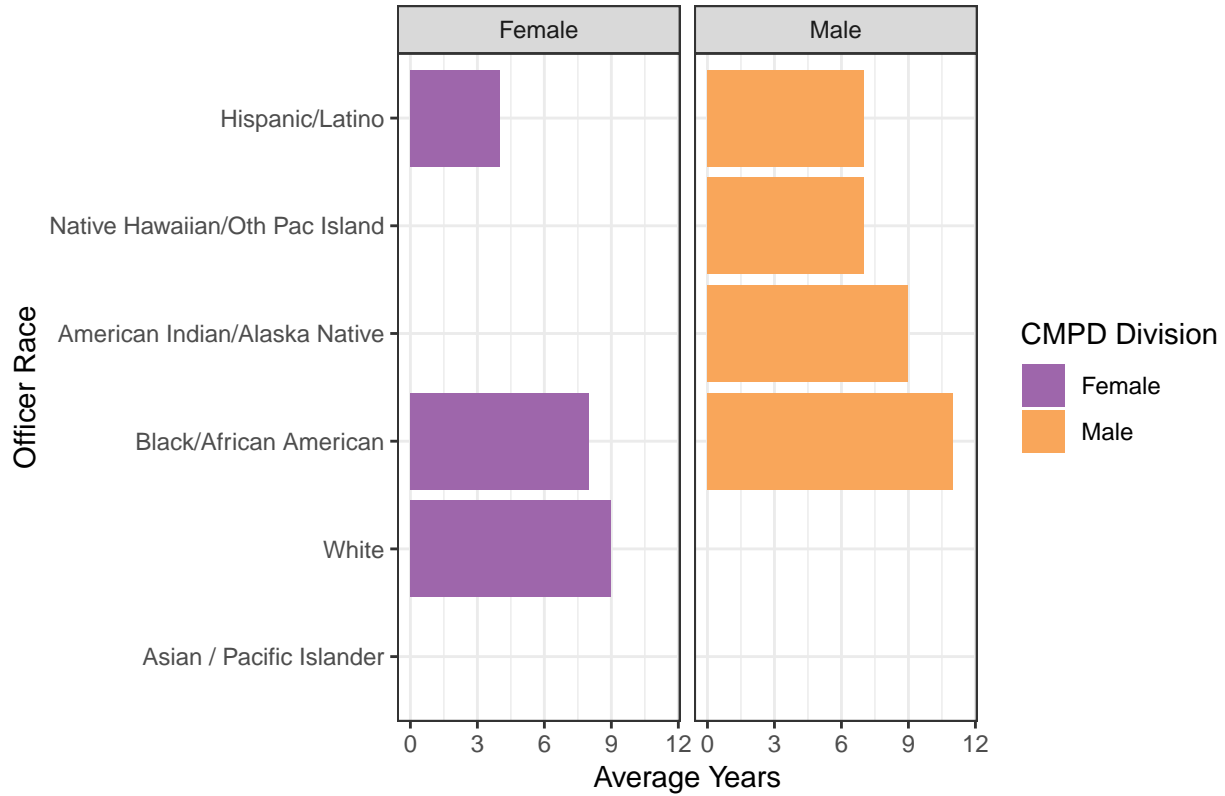


We observe that most of the stops were being conducted by *white male* officers, followed by *black/African American* officers, followed by *white female* officers. *Asian* and *Hispanic/Latino* officers conducted the least number of stops during 2006.

Table 2: Officer Data by Average Years of Service

Officer Race	Gender	Average Years of Service
Asian / Pacific Islander	Male	12
White	Male	12
Black/African American	Male	11
American Indian/Alaska Native	Male	9
White	Female	9
Black/African American	Female	8
Hispanic/Latino	Male	7
Native Hawaiian/Oth Pac Island	Male	7
Hispanic/Latino	Female	4

### Summary of Officers by Race and Average Years of Ser



Now, let us summarise and visualize the officer data by their respective CMPD divisions.

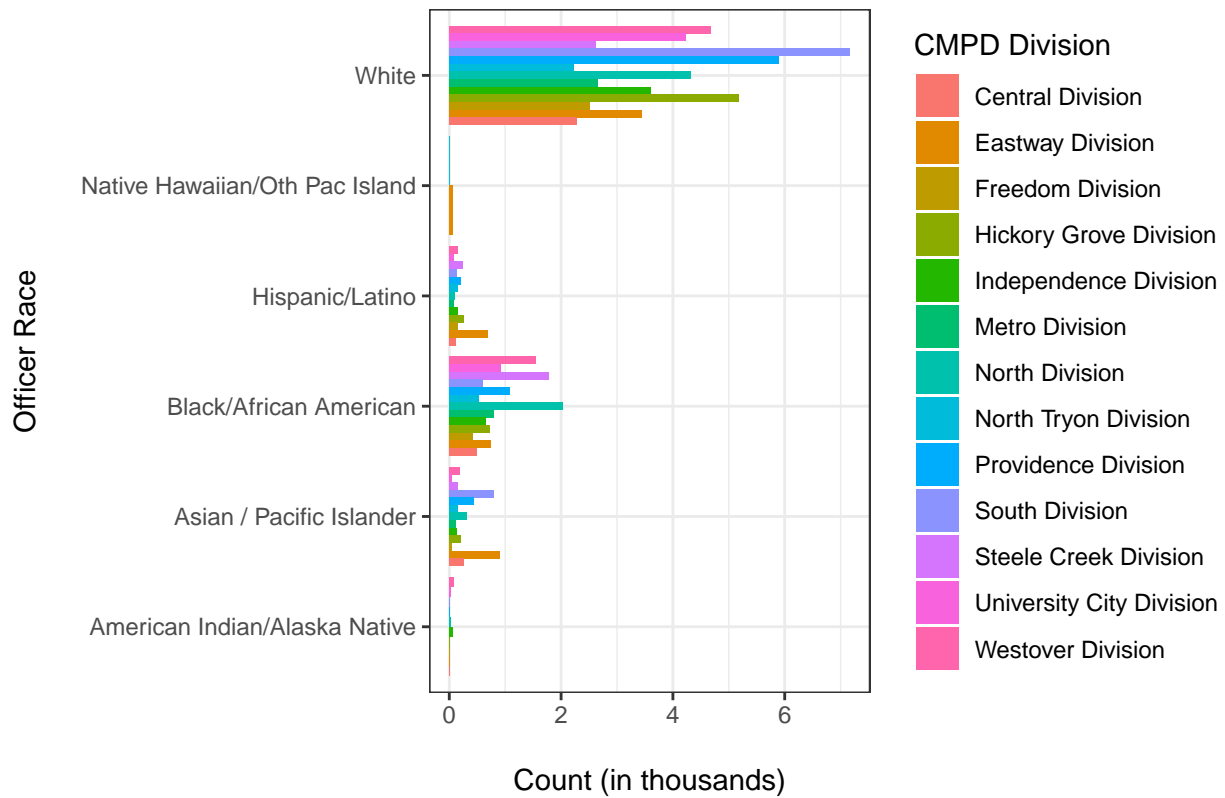
Table 3: Summary of Officer Data by CMPD Division

CMPD Division	Count
South Division	8,699
Providence Division	7,634
North Division	6,782
Westover Division	6,642
Hickory Grove Division	6,383
Eastway Division	5,833
University City Division	5,302
Steele Creek Division	4,788
Independence Division	4,613
Metro Division	3,652
Central Division	3,148
Freedom Division	3,130
North Tryon Division	3,041

We observe that there is a high number of NAs in the CMPD Division data of officers, which is 9586. We also observe that the highest number of officers were from *South Division*, *Providence Division*, *North Division*, *Westover Division* and *Hickory Grove Division* respectively in decreasing numbers.

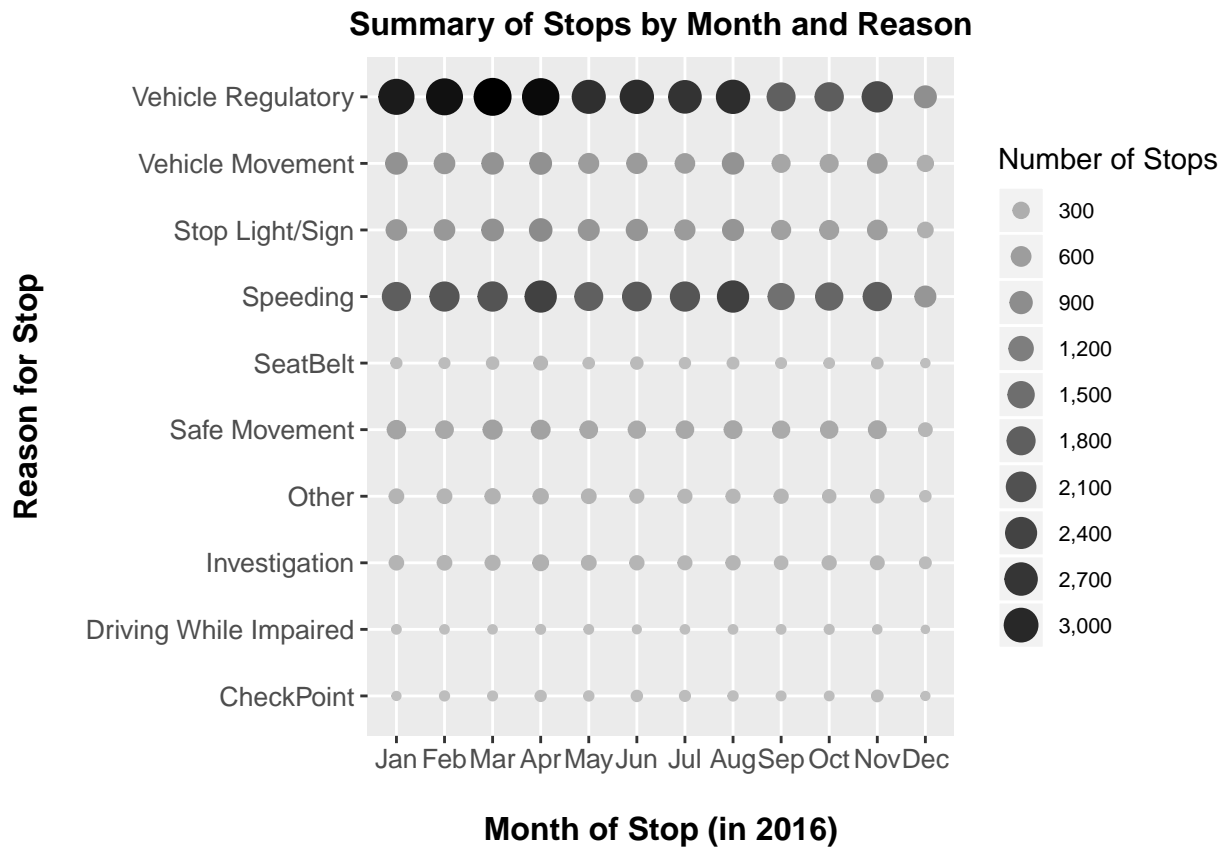
Let us now visualize the officer data that we have previously summarized.

### Summary of Officer Data by Race and CMPD division



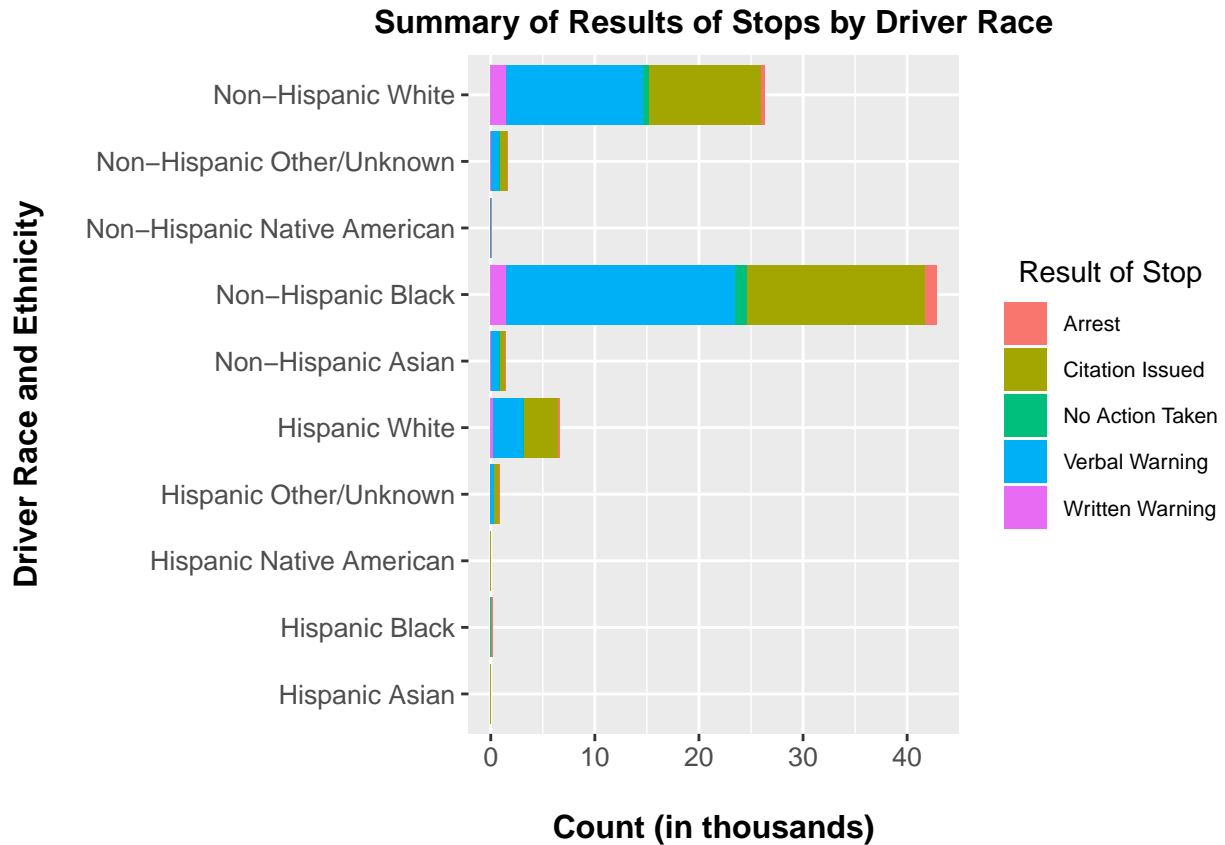
We observe that the highest number of stops were being conducted by officers of *white* race from the “*South Division*”, followed by *Providence Division* and *Hickory Grove Division*. A lot of stops were also being conducted by *black/African American* officers.

Let us now visualize the number of stops by months of 2016.

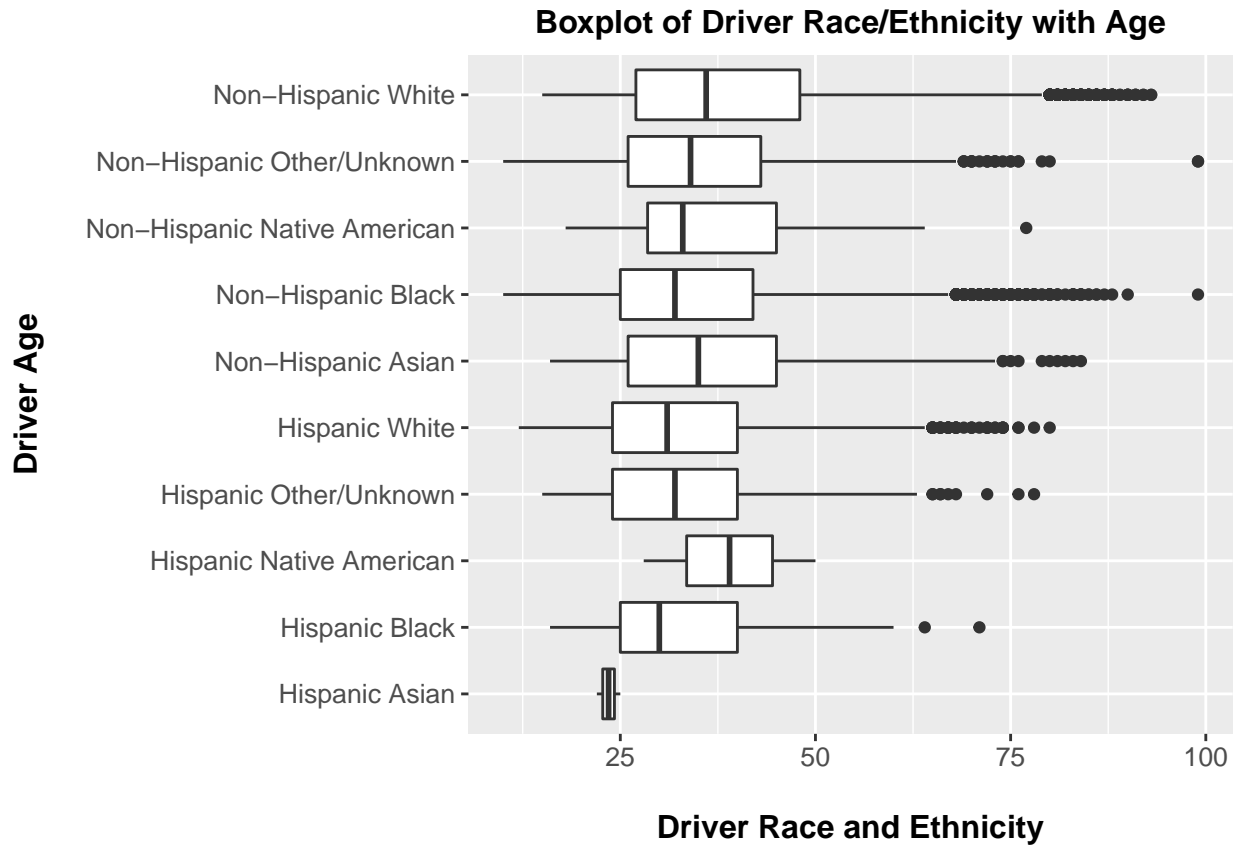


We observe that the maximum number of stops occurred for *vehicle regulatory* and *speeding* reasons.

Now, let us investigate the result of the stops as well as the race/ethnicity and age of the driver.



We observe that the majority of drivers which were stopped in 2016 were Non-Hispanic Black and Non-Hispanic White. We also observe that the result of the stop was a *verbal warning* followed by *citation issued*. This remained the same for all racial and ethnic groups of people. Let us further dive into the age distribution of these drivers, and whether a search was conducted by the officers.



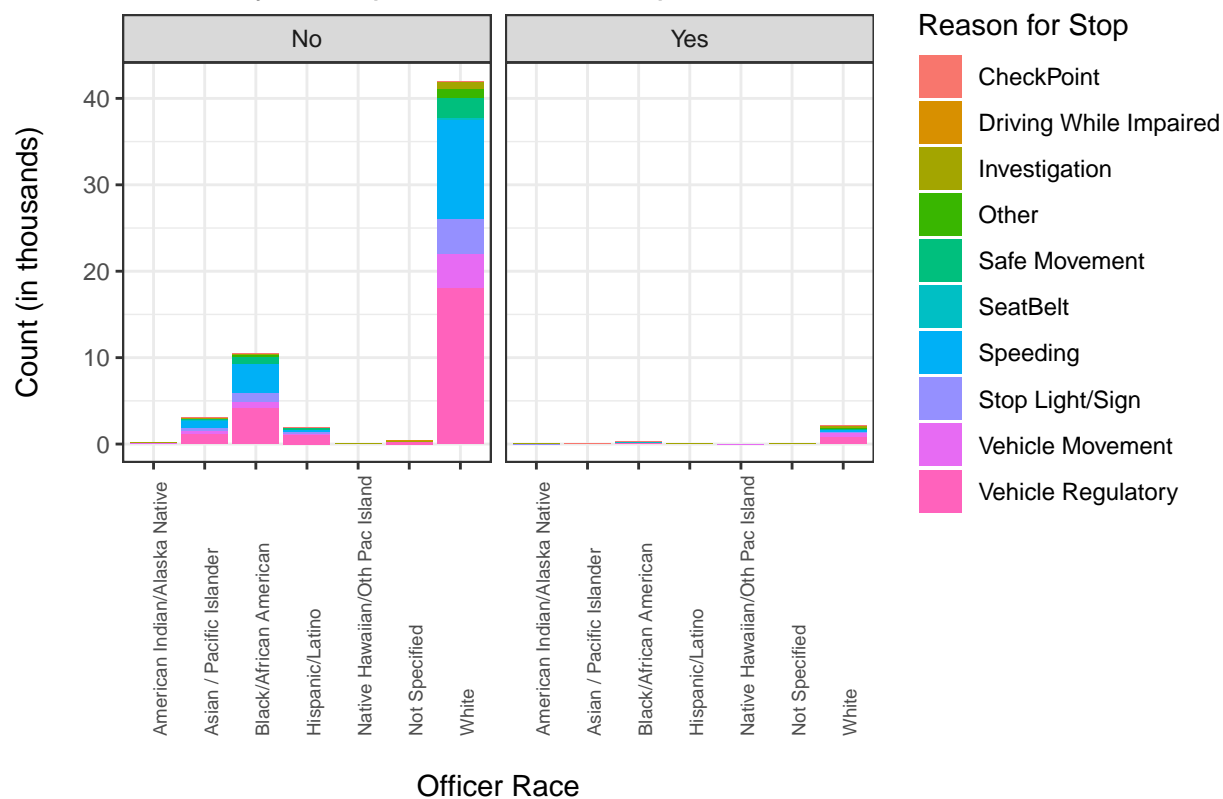
We can observe from the boxplot above that the drivers belonging to the race and ethnicity group of Non-Hispanic White and Non-Hispanic Black have the highest amount of outliers with respect to age. We investigate whether a search was conducted for these drivers.

Driver Race and Ethnicity	Search Conducted	Number
Non-Hispanic Black	No	40,365
Non-Hispanic White	No	25,882
Non-Hispanic Black	Yes	2,467
Non-Hispanic White	Yes	464

We observe that a search was not conducted for 94.24% of Non-Hispanic Black drivers, and for 98.24% of Non-Hispanic White drivers, which is a significant percentage of the drivers. We also notice a search was conducted for 5.76% of Non-Hispanic Black drivers, which is significantly higher than 98.24% of Non-Hispanic White drivers.

Let us now explore the reasons of stops which occurred for drivers of Non-Hispanic White and Non-Hispanic Black race and ethnicity. Let us also explore the officers which conducted these investigations.

### Summary of Stop Data of Non-Hispanic Black and White Drivers



Thus, we observe that the major reasons for stopping for Non-Hispanic White and Non-Hispanic Black drivers were also *vehicle regulatory* and *speeding*. Thus, there is no major outlier in this data.