

# NYPD Stop And Frisk Data Analysis



**ALY6015-21454: Intermediate Analytics**

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**Submitted by: Group 4**

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# What is Stop and Frisk Policy?

- Introduced in 1968, enabling a police officer to stop and question a person with reasonable suspicion
- Meant to prevent any unlawful activities
- Frisking is done to check for any possible illegal weapons or contrabands to be found
- Down the year, this policy was being claimed as racist activity, specially the black race harassment



# Data Overview

## Data Properties:

- Precinct level count data
- Year range: 2003-2015
- No Null values
- Gender: Male/ Female

## Races Analyzed during stops:

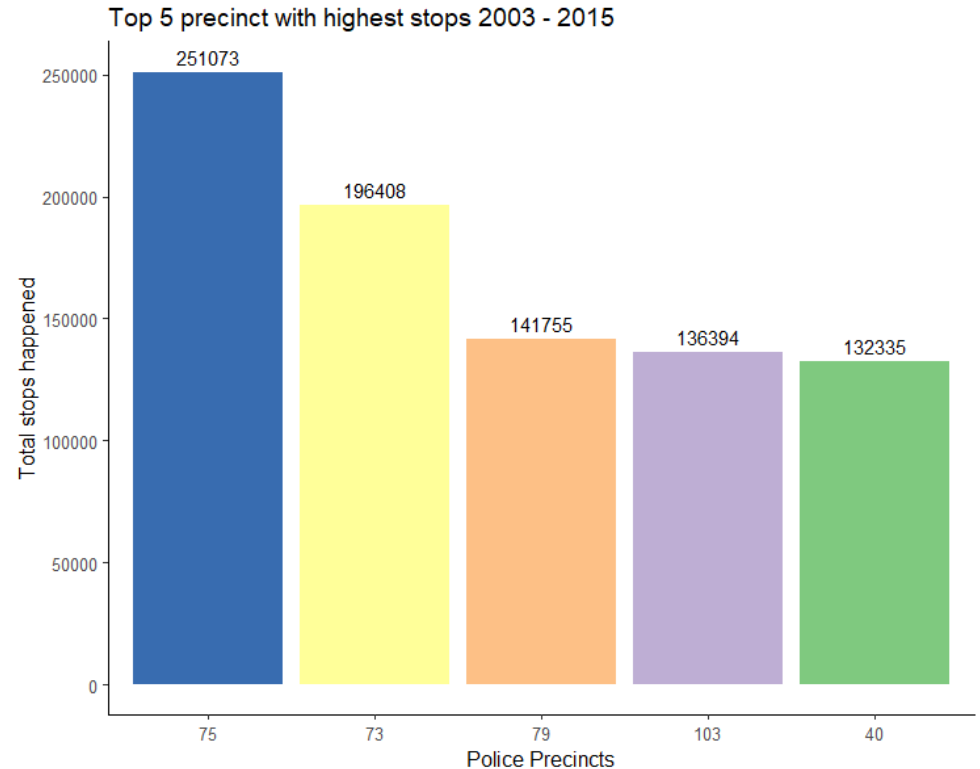
- Black African American
- White
- Hispanic (Black/White)
- Asian and Pacific Islander
- American Indian and Alaskan Native

## Data Grouping by Variables:

- Year
- Precinct
- Sex
- Race

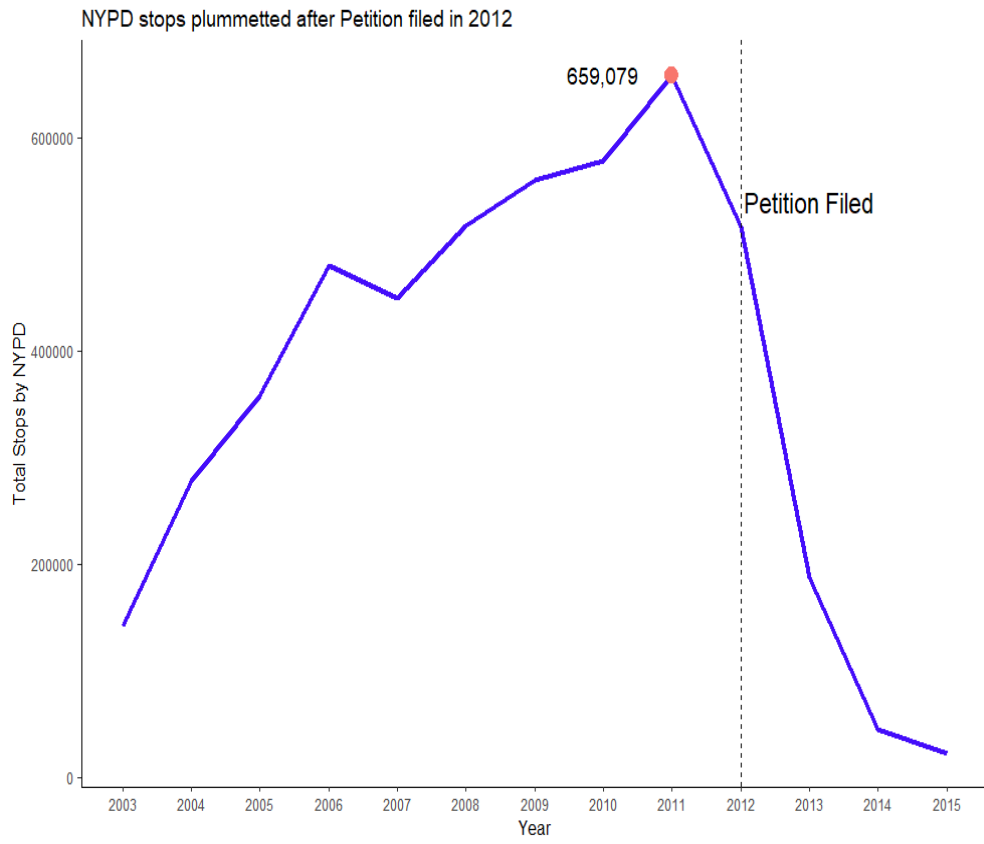
# Which precincts are with the Highest stops?

- The graph discusses the total stops happened at each police precinct.
- The highest number of stops is observed at **precinct 75**, East New York.
- The 2nd highest population were stopped at precinct 73, Ocean Hill Brownsville.
- The 3rd highest stopped at precinct 79, Bedford-Stuyvesant.



# Rise and Fall of this policy usage

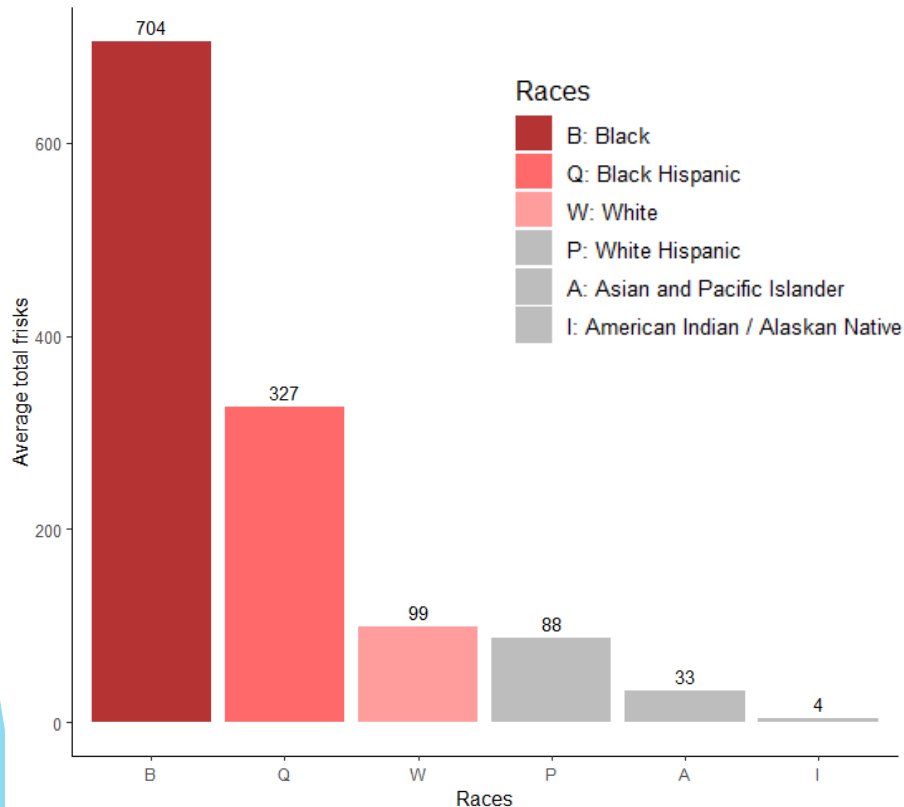
- Since 2003, gradual increment in the stops can be seen till 2011
- Around 650K people were stopped in New York across precincts
- Many Civil rights organizations voiced against this policy
- As soon, petitions were filed, overall “stops” got plunged in number



# Most affected races from Stop and Frisk policy in NY

People from Black race had been frisked the most

Source: NYPD department data

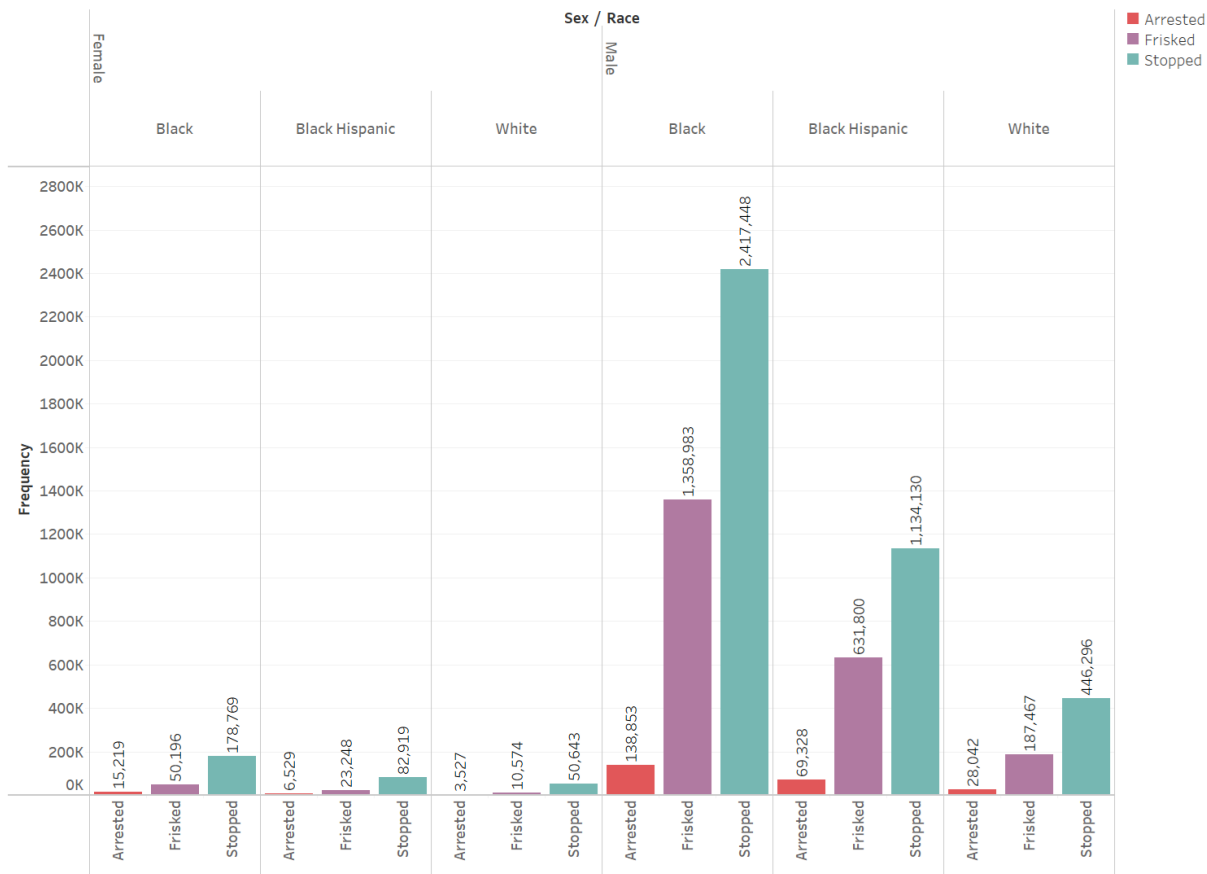


- People from Black and Black-Hispanic race was worst affected from this stop and frisk policy
- On an average, people from Black race are getting frisked more than six times higher than people from other races

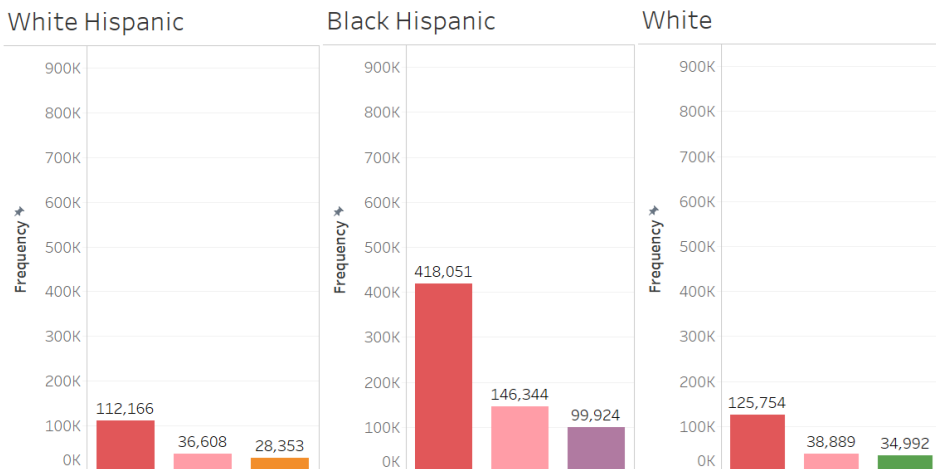
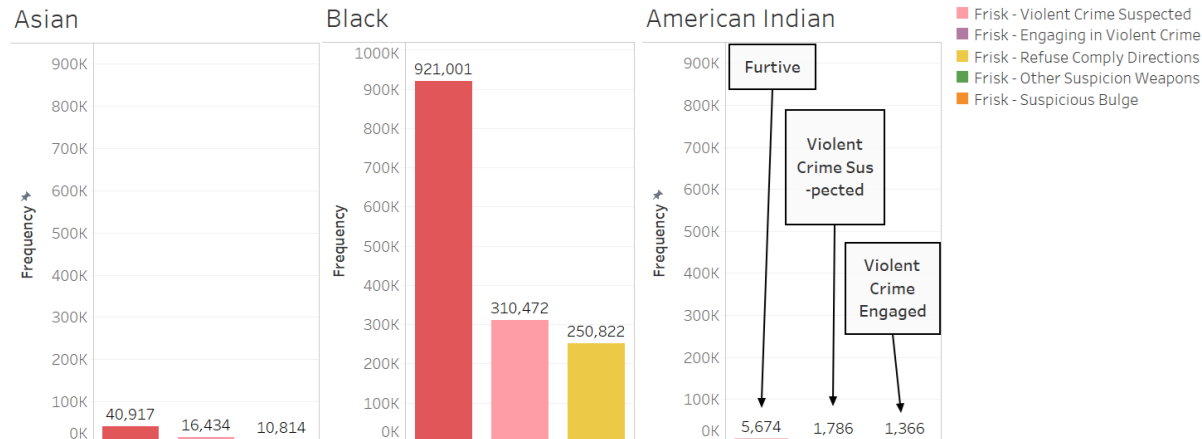
## How do arrests, frisks, and stops compare for Black, Black Hispanic, and White men and women?

- Female on left and male on right
- Just Black, Black Hispanic, and White races
- Black males have highest arrests, frisks, and stops
- White women arrested, frisked, and stopped the least

Total Arrests, Frisks, and Stops By Race and Sex



## Top 3 Reasons For Frisks

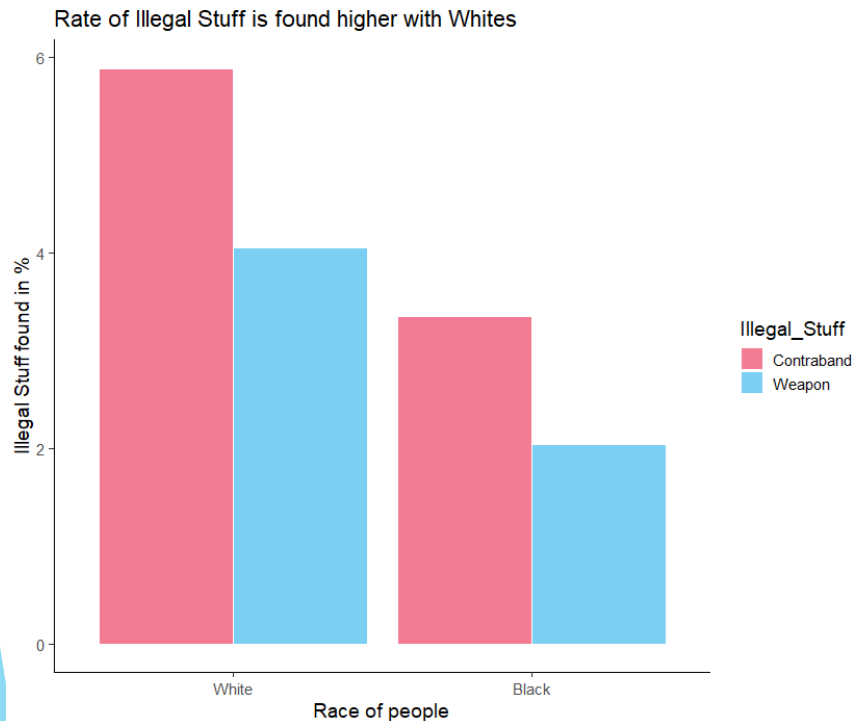


## What are the top 3 reasons for frisks by race?

- Furtive movements are highest reasons for frisks
- Scale for Black race goes above 900,000
- Frisk due to suspected violent crime is second for all races
- Frisk due to engaging in violent crime is third highest for Asian, American Indian, and Black Hispanic
- Frisks due to refusal to comply with officer, suspicious bulge, and other suspicion of weapons only show up for Black, White Hispanic, and White races



# Is this policy really working as expected?



***Race - White***

*Total frisked*  
**198,041**

*Weapons Found*  
**4.05%**

*Contraband found*  
**5.89%**

***Race - Black***

*Total frisked*  
**1,410,179**

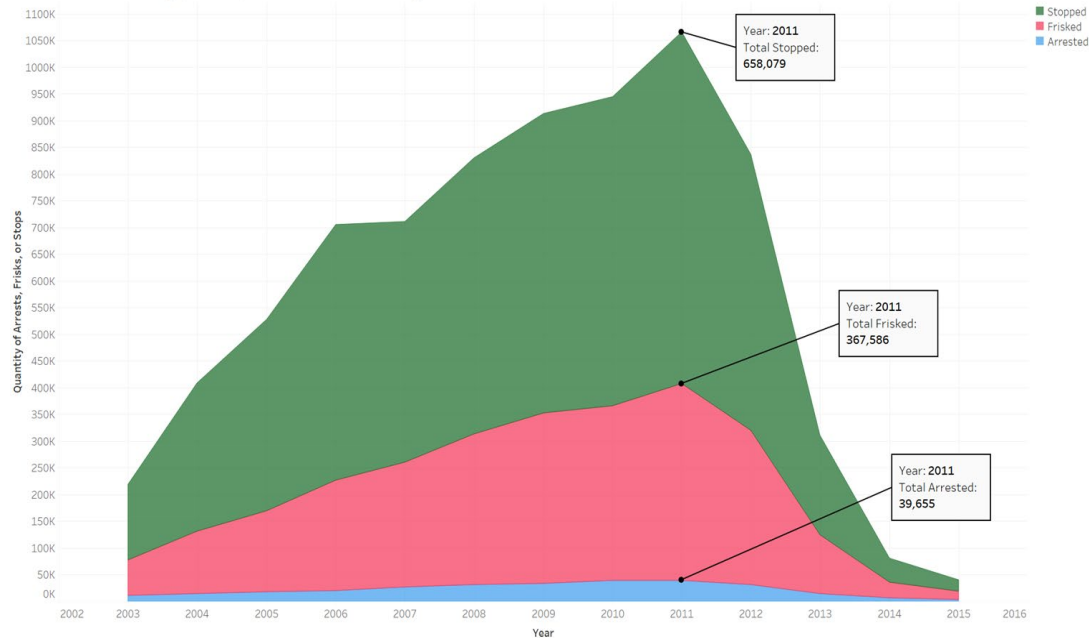
*Weapons Found*  
**2.04%**

*Contraband found*  
**3.35%**

# How do the numbers of stops, frisks, and arrests compare?

- Stops largely outnumber frisks and arrests
- Peak year for stops, frisks, and arrests was 2011
- All three increased until 2011, right before the petition was filed
- Small portion of stops result in arrests

Total Number of Stops, Frisks, and Arrests According to Year



# Is the Frisk-to-Stop ratio statistically similar across races?

- Performed ANOVA to compare the frisk to stop ratio among Black, Black-Hispanic and White races
- **Null Hypothesis** = Average frisk to stop ratio is similar across races
- Found *significant difference* among the average frisk to stop ratio for the races

F- value	91.05
Critical value	2.997228
alpha	0.05
P -value	<0.0000000000000000 2

# Was there any change in frisking pattern among races after petition filed?

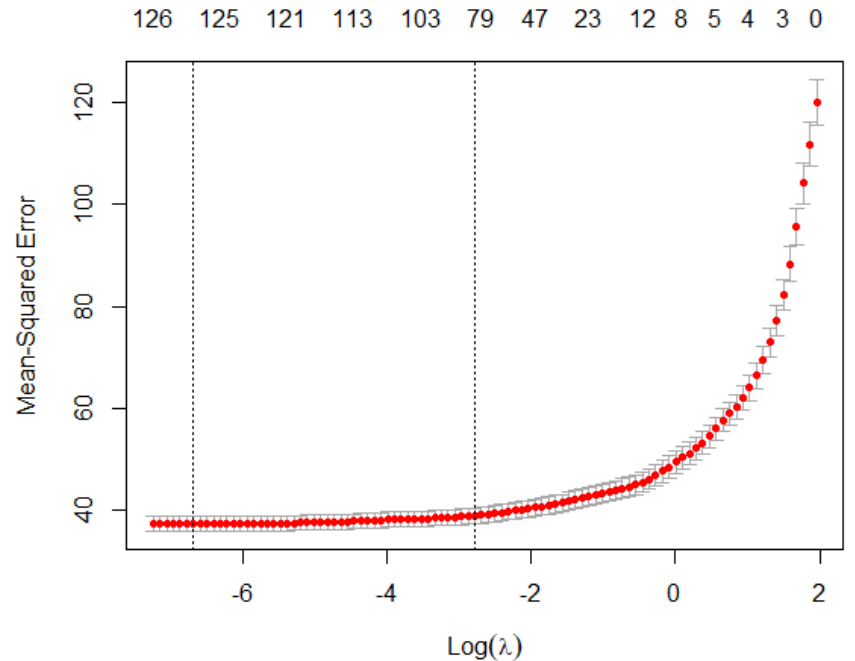
- Observed drop in stops after 2012 petition
- Performed Chi-squared test of independence to check frisking pattern difference among races for year 2011 and 2012
- **Null Hypothesis** = Average frisk by year is independent of the races
- Filed **petition did made a change** in frisking ratio among races

method	Pearson's Chi-squared test
Chi-squared Statistic	1.465169
Critical Value	11.0705
alpha	0.05
p-value	0.917054
Degree of Freedom	5

# Predicting frisking proportion using Regression model

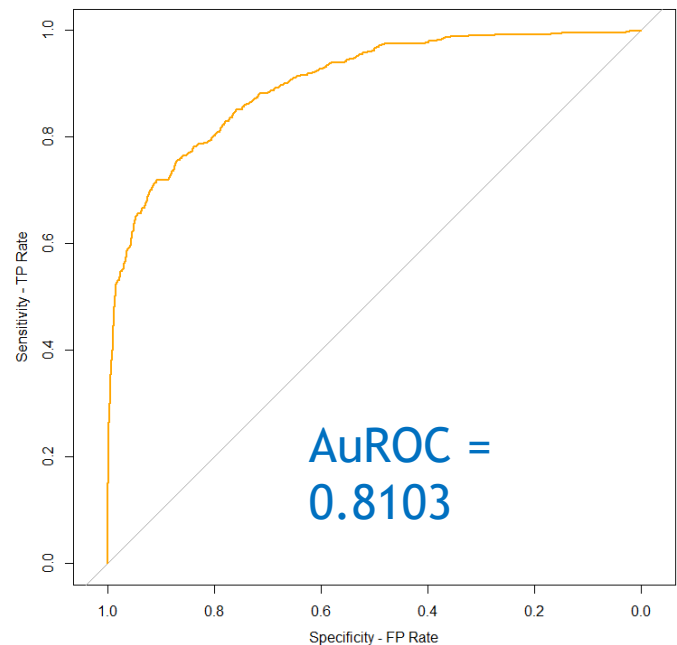
- Grouped by year, precinct, and sex
- Then found sum of stops and computed proportion of frisks to total stops
- Compared with OLS model by selecting variables using best subset, all predictors were significant at .001 alpha level
- Created training and test sets, then ran LASSO model
- LASSO eliminated less significant predictors from model
- Table of RMSE values:

	OLS RMSE	LASSO RMSE
train predictions	6.632	5.849
test predictions	6.404	5.594



# Determining the High and Low Frisking ratio

- If frisk to stop ratio greater than or equal to .5 set binary variable to 1, else 0
- Executed binomial glm with predictors like race, sex, furtive movements, attire, bulge, verbal threats, searched, weapon found, and others
- Used model to make predictions on training and test sets
- Performance metrics on training and test sets:



	Accuracy	Specificity	Precision	Recall
Training Set	0.8595	0.6659	0.8532	0.9547
Test Set	0.8537	0.6467	0.8554	0.9475

# Conclusion

- By analysis, we found that people of color were being worst affected by “Stop and Frisk” policy
- Using ANOVA, we observed that average frisking ratio is not similar across races
- At first this policy was made without any bias to prevent unlawful activities, later it was also being used for racial discrimination
- People from “Black” race are being stopped and frisked much higher than other races
- Proportion of illegal weapons and contraband found was higher in “White” race than “Black” when compared to the number of times they got frisked
- Important variables to build model are race, gender, bulge spotted, description, furtive movements etc.

# References

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Thank You  
For being a Great  
Audience

Any Queries?