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# United States Police Shootings (2015-2020)

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# Agenda

- **Introduction**
- **Dataset**
- **Visualization**
  - **Police shooting of Victims using Race**
  - **Racial Distribution of Victims ( Unarmed )**
  - **Gender Distribution**
  - **Age**
  - **Number of Police Shootings ( 2015-2020 )**
  - **Most Common Weapons used**
  - **Distribution of armed and unarmed victims**
  - **Victims with Mental Illness**
  - **Citywise Police Killings**
- **ANOVA Regressions**
- **Conclusion**





# Purpose

- The purpose of our analysis was to primarily discover if race followed by being armed and political party in power was a factor in the variation of police shootings in the United States from 2015 to 2020.
- The secondary purpose of our analysis was finding facts on gender, age, weapon type, and mental illness.







# Dataset

**Number of Rows : 4851**

**Number of Columns: 15**

Our dataset consists of nominal, ratio, categorical attributes such as:

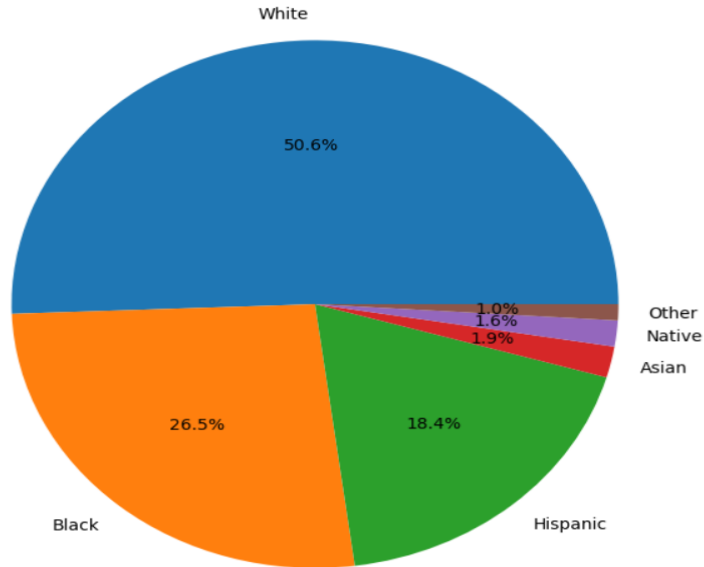
- Name
- Age
- Gender
- Race
- City
- State
- Armed/Unarmed

Detail	Compact	Column	10 of 15 columns ▾	
id	name	date	manner_of_death	armed
Identity	name of shot person	yyyy-mm-dd format	How they were killed? (e.g. Shot, Tasered, etc)	Weapons
	<b>4851</b> unique values		shot <b>95%</b> shot and Tasered <b>5%</b>	gun knife Other (1432)
3	5925	1Jan15	14Jun20	
1608	Omar Mateen	2016-06-12	shot	gun
1609	Daniel Bennett Edwards	2016-06-12	shot	knife
1617	John Williams	2016-06-12	shot	gun
1619	Joshua Sciscm	2016-06-13	shot	gun
1620	Michael Moore	2016-06-13	shot	gun
1621	Edward Acquisto	2016-06-13	shot	gun
1623	Kenneth Allen Pointer	2016-06-13	shot	unknown
1618	Noel Rodriguez	2016-06-14	shot	unknown
1622	Nicholas Ferro	2016-06-14	shot	gun



# Visualization 1: Race

**Police Shooting Victims using Race**

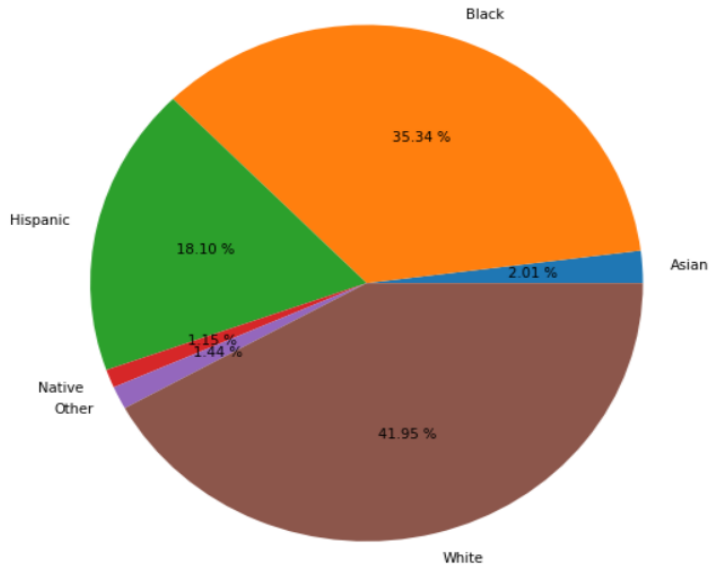


- We can see that 50% of the people shot are white and 26% of people are black followed by 18% of people are hispanic.
- While white people make up half the population of victims shot, there is some disproportions in the percentage of total populations by race.
- Later, we are going to dig deeper into the difference among the races with a highlight on Whites, Blacks, and Hispanics.



## Visualization 2: Racial Distribution of Victims (Unarmed)

Racial distribution of victims who were unarmed

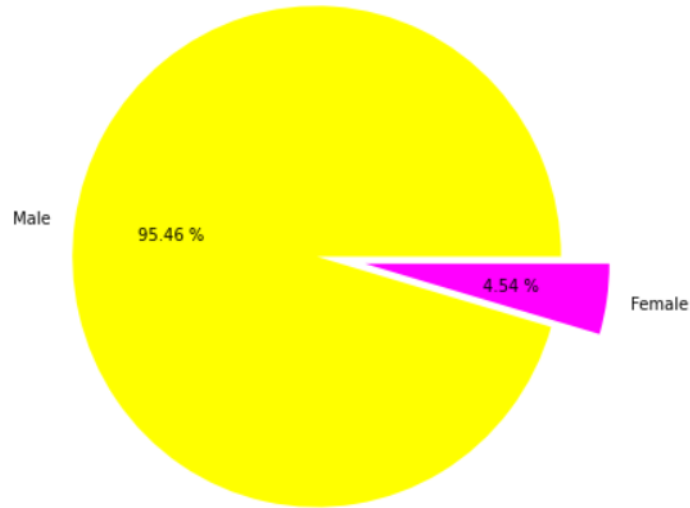


- 42% of unarmed victims were white, followed by 35% black and 18% hispanic.
- Considering the population of the United States, the count of unarmed black and hispanic is higher
- Out of 100 victims, 6 were unarmed victims for a total 318 unarmed individuals.



## Visualization 3: Gender Distribution

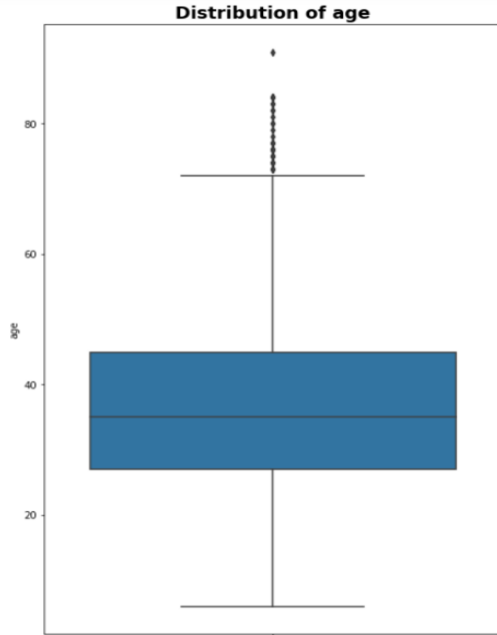
**Gender distribution of the victims**



- It is evident that 95% of victims are male and 5% of victims are female.
- This is not a surprise as males are known to be more violent than females



# Visualization 4: Age



	id	name	date	manner_of_death	armed	age	gender	race	city	state	signs_of_mental_illness	threat_level	flee	body_camera	arms_
811	980	Jeremy Mardis	2015-11-03	shot	unarmed	6.0	M	White	Marksville	LA	False	other	Car	True	
2761	3229	Kameron Prescott	2017-12-21	shot	unarmed	6.0	M	White	Schertz	TX	False	other	Not fleeing	False	

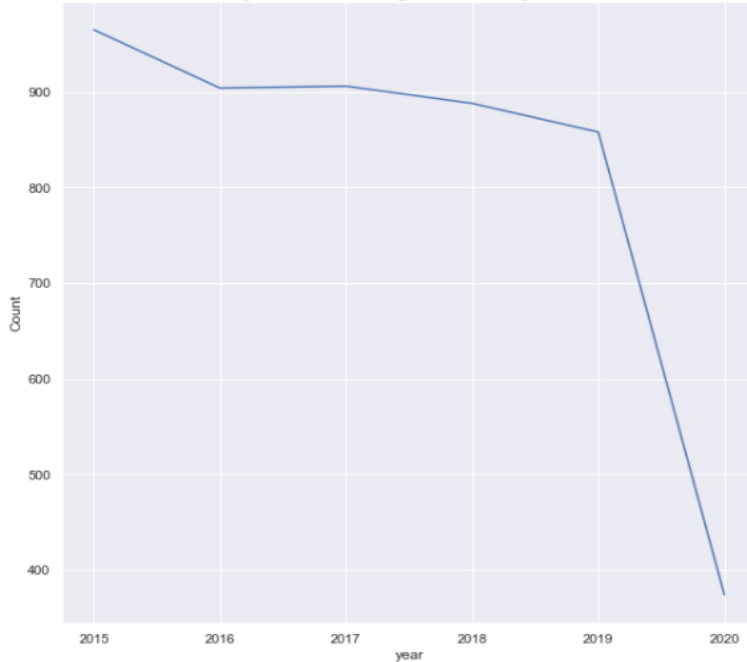
- For both men and women, and across all racial and ethnic groupings, the risk of being killed by police peaks between the ages of 25 and 45.
- The minimum age shot was 6 years old; unarmed, which was severely unacceptable.





# Visualization 5: Number of Police Shootings (2015-2020)

Number of police shootings over the years 2015-2020



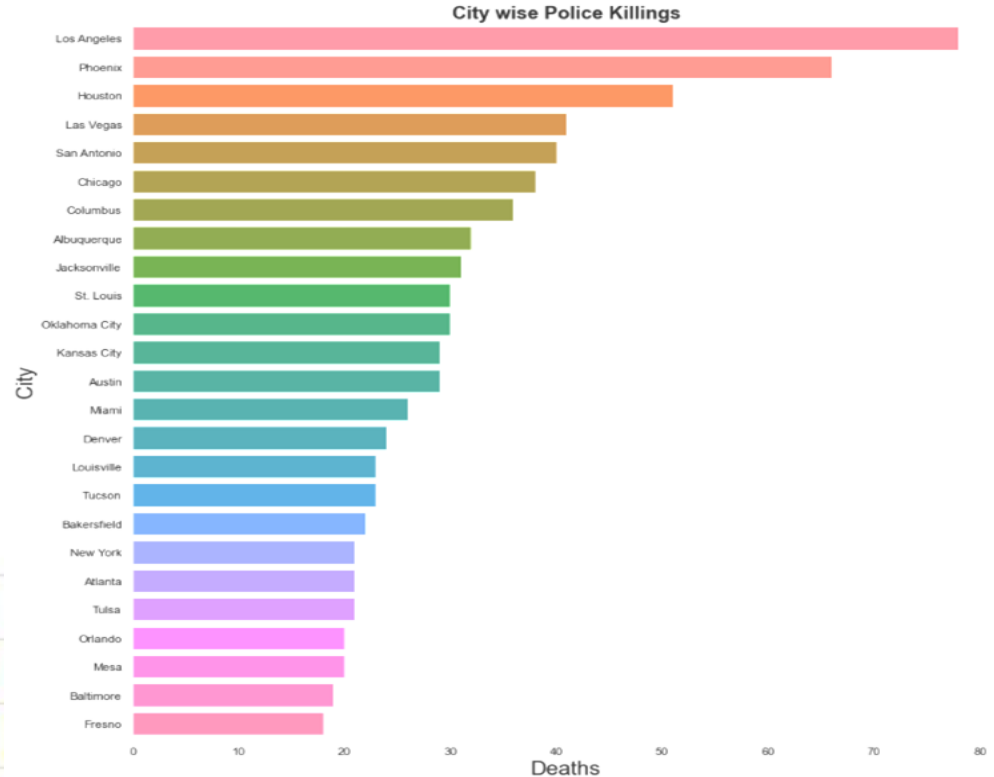
- According to the chart, the United States has an average between 850 - 950 shootings per year.
- The chart is slightly decreasing from 2015-2019, which is a good sign.
- Note data from second half of 2020 is incomplete.



## Visualization 6: Citywise Police Killings

- Police shootings have taken place in every state and have occurred more frequently in cities where populations are concentrated.
- From the analysis, states with the highest rates of shootings are LA, Phoenix and Houston.

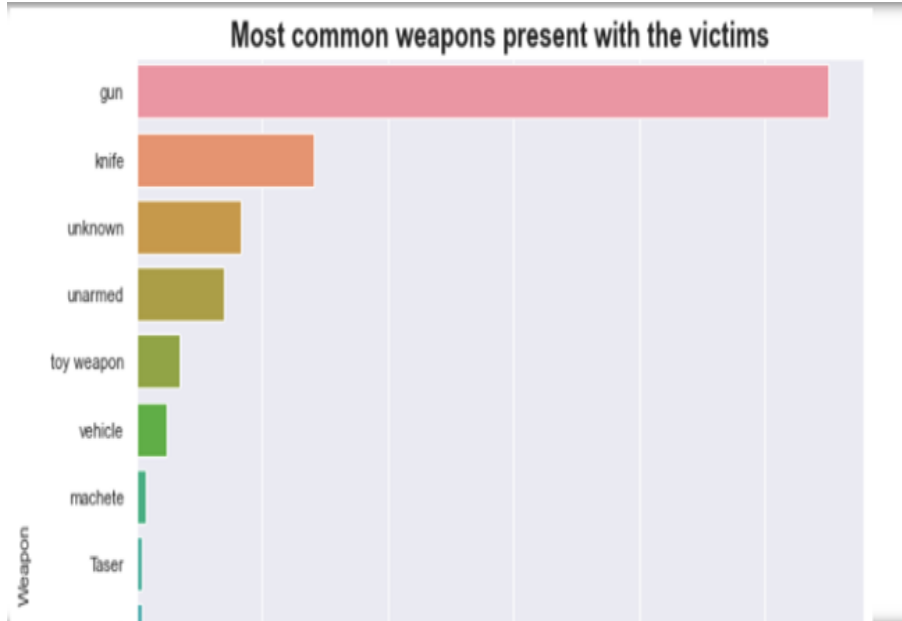
Democratic	63.00%
Republic	31%
Independent	6%





# Visualization 7: Most common weapons used

In the United States, guns are the most commonly used weapon in shootings followed by knives.



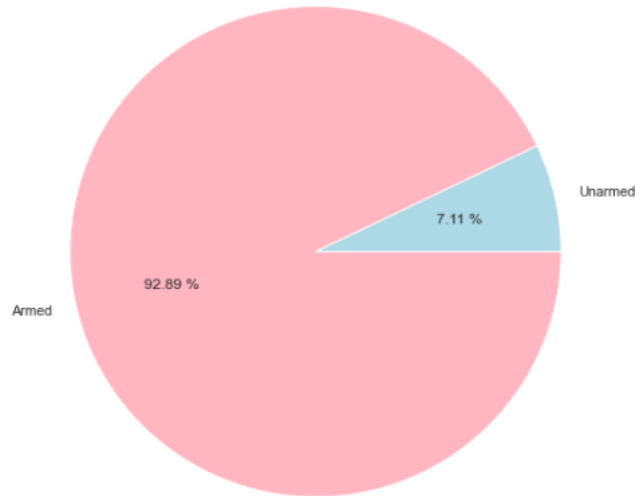
['BB gun' 'BB gun and vehicle' 'Taser' 'air conditioner' 'air pistol' 'ax' 'barstool' 'baseball bat' 'baseball bat and bottle' 'baseball bat and fireplace poker' 'baseball bat and knife' 'baton' 'bayonet' 'bean-bag gun' 'beer bottle' 'blunt object' 'bow and arrow' 'box cutter' 'brick' 'car, knife and mace' 'carjack' 'chain' 'chain saw' 'chainsaw' 'chair' 'contractor's level' 'cordless drill' 'crossbow' 'crowbar' 'fireworks' 'flagpole' 'flashlight' 'garden tool' 'glass shard' 'grenade' 'gun' 'gun and car' 'gun and knife' 'gun and sword' 'gun and vehicle' 'guns and explosives' 'hammer' 'hand torch' 'hatchet' 'hatchet and gun' 'ice pick' 'incendiary device' 'knife' 'lawn mower blade' 'machete' 'machete and gun' 'meat cleaver' 'metal hand tool' 'metal object' 'metal pipe' 'metal pole' 'metal rake' 'metal stick' 'motorcycle' 'nail gun' 'oar' 'pellet gun' 'pen' 'pepper spray' 'pick-axe' 'piece of wood' 'pipe' 'pitchfork' 'pole' 'pole and knife' 'rock' 'samurai sword' 'scissors' 'screwdriver' 'sharp object' 'shovel' 'spear' 'stapler' 'straight edge razor' 'sword' 'toy weapon' 'unarmed' 'unknown' 'vehicle' 'vehicle and gun' 'vehicle and machete' 'walking stick' 'wasp spray' 'wrench']

"The pen is mightier than the sword," they say,  
but is the pen actually considered a weapon?  
That's Shocking!



## Visualization 8: Distribution of Armed and Unarmed Victims

Distribution of Armed and Unarmed victims when killed by the police



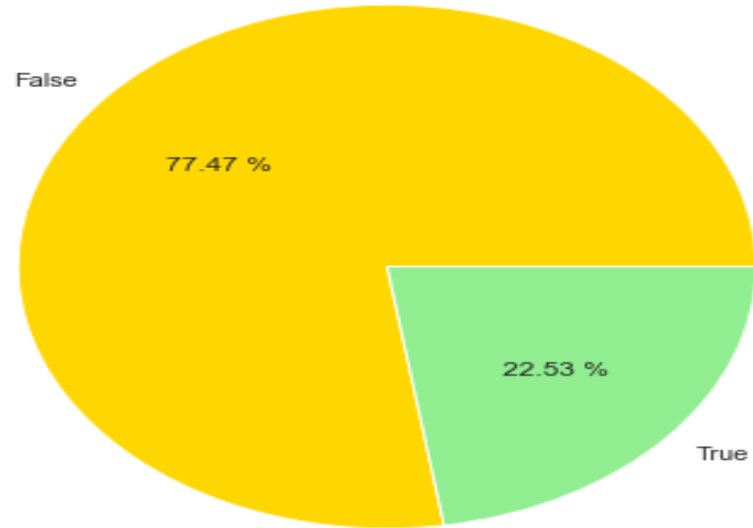
- Instances shows more of police killings that were objectively reasonable, with 93% of victims being armed compared to 7% unarmed.
- The limited data that was available to us, we cannot determine the exact reasons for killing, yet still we can conclude that armed victims are more likely to be killed by police than unarmed victims.



## Visualization 9: Mental Illness

- The chart reveals that 77% of victims did not have mental illness where 23% of victims did have mental illness.
- We can conclude that 23 out of 100 victims were mentally ill.

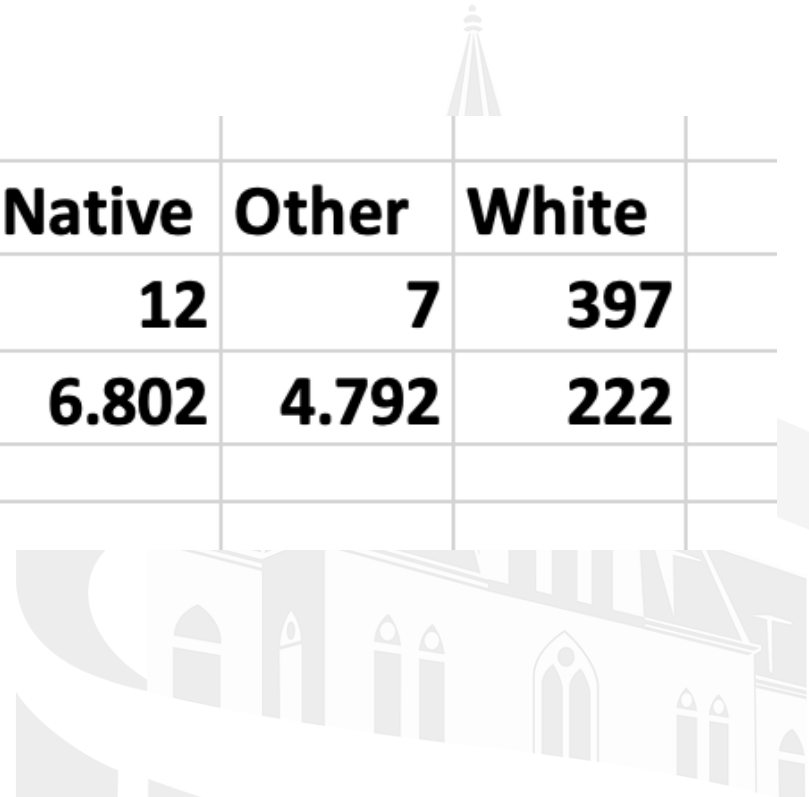
Victims with some mental illness





## Mean & Stdv.s

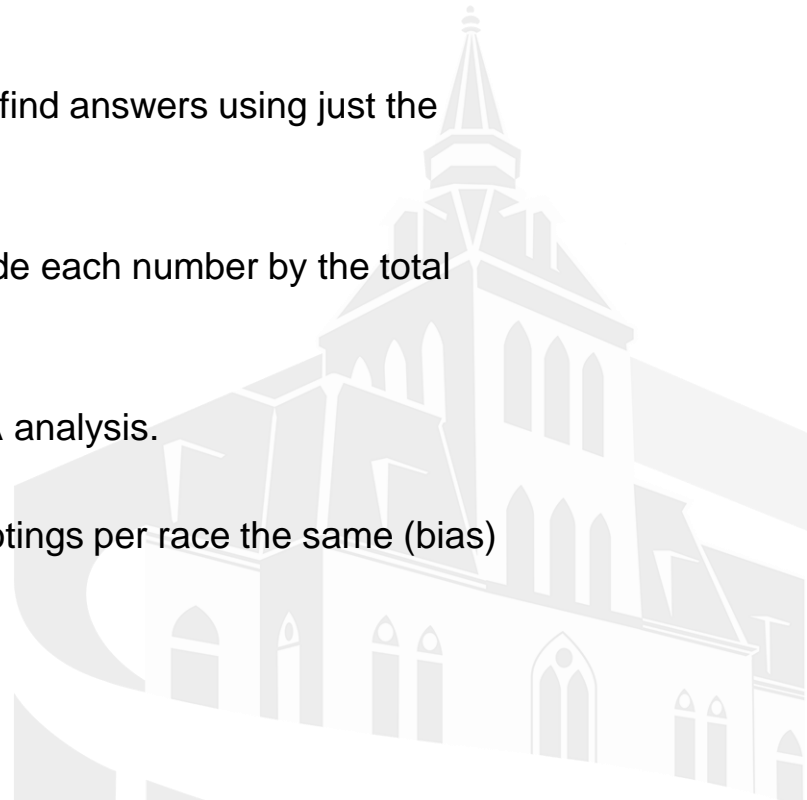
	Asian	Black	Hispanic	Native	Other	White
Mean	15	209	146	12	7	397
Stdv.s	4.604	66.71	50.7333	6.802	4.792	222





# ANOVA Regression Intro:

- Before running our regression, we struggled to find answers using just the individuals shot per year.
- Total individuals shot by race per year and divide each number by the total United States population of each race per year.
- These are the numbers reflected in the ANOVA analysis.
- ANOVA: Null: Are all the averages of total shootings per race the same (bias) or Alt: are they different (not bias).





# ANOVA Regression (95% CI)

**H0:** Avg of (A)=Avg of (B)=Avg(H)=Avg(N)=Avg(O)=Avg(W)

**H1:** At least one of the averages is different from the others

**P Value** of .000359 < **P Value** .05 : Reject the null

**Conclude:** Averages of shootings per race are different

Anova: Single Factor						
SUMMARY						
Groups	Count	Sum	Average	Variance		
A	6	4.7184E-06	7.864E-07	5.67611E-14		
B	6	2.90078E-05	4.83463E-06	2.44571E-12		
H	6	1.47163E-05	2.45272E-06	7.41555E-13		
N	6	1.81477E-05	3.02462E-06	2.69735E-12		
O	6	1.82715E-05	3.04524E-06	3.5696E-12		
W	6	1.23104E-05	2.05173E-06	4.81132E-13		
ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	5.3547E-11	5	1.07094E-11	6.430713543	0.000359203	2.53355455
Within Groups	4.99605E-11	30	1.66535E-12			
Total	1.03507E-10	35				





# ANOVA Post-Hoc Regressions

t-Test: Two-Sample Assuming Unequal Variances

	<i>W</i>	<i>B</i>
Mean	2.05173E-06	4.83463E-06
Variance	4.81132E-13	2.44571E-12
Observations	6	6
Hypothesized Mean	0	
df	7	
t Stat	-3.984509203	
P(T<=t) one-tail	0.002646681	
t Critical one-tail	3.130418397	
P(T<=t) two-tail	0.005293362	
t Critical two-tail	3.638827341	

## Post-Hoc of White & Black

**Two Tail P Value** of .0052 < **P Value** of .0083

**Conclusion:** Reject the null



# ANOVA Post-Hoc Regressions

## t-Test: Two-Sample Assuming Unequal Variances

	<i>B</i>	<i>H</i>
Mean	4.8346E-06	2.4527E-06
Variance	2.4457E-12	7.4156E-13
Observations	6	6
Hypothesized Mean Difference	0	
df	8	
t Stat	3.26807835	
P(T<=t) one-tail	0.00569444	
t Critical one-tail	3.01839452	
P(T<=t) two-tail	0.01138888	
t Critical two-tail	3.48160898	

## Post-Hoc of Black & Hispanic

Two-Tail P Value of .011 >  
P Value of .0083

**Conclude:** Fail to reject the null



# ANOVA Post-Hoc Regressions

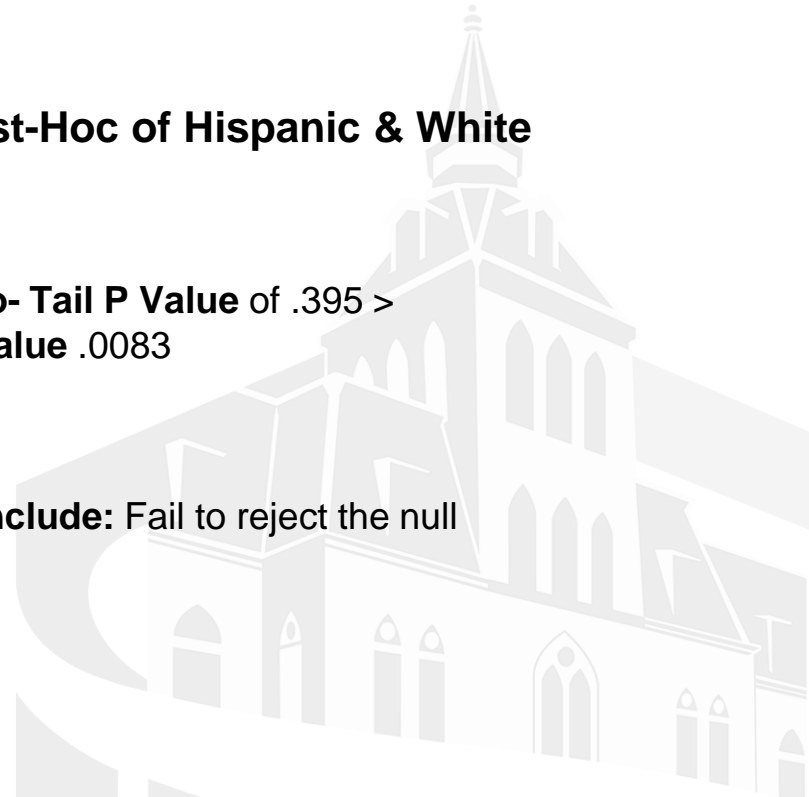
## t-Test: Two-Sample Assuming Unequal Variances

	<i>H</i>	<i>W</i>
Mean	2.4527E-06	2.0517E-06
Variance	7.4156E-13	4.8113E-13
Observations	6	6
Hypothesized Mean Difference	0	
df	10	
t Stat	0.88829279	
P(T<=t) one-tail	0.19762367	
t Critical one-tail	2.87241124	
P(T<=t) two-tail	0.39524734	
t Critical two-tail	3.27921165	

## Post-Hoc of Hispanic & White

**Two- Tail P Value** of .395 >  
**P Value** .0083

**Conclude:** Fail to reject the null

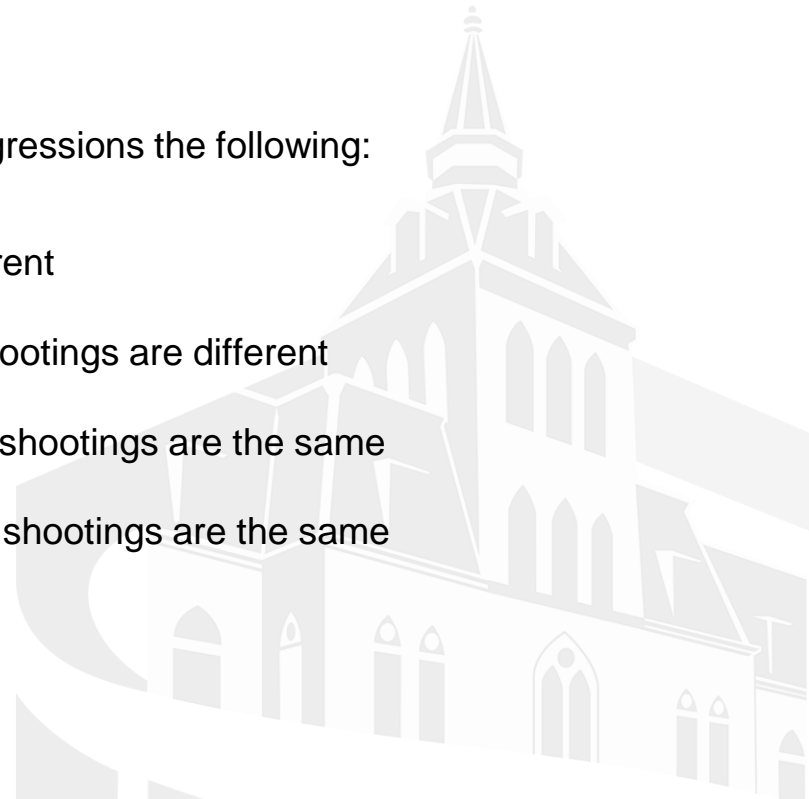




# Conclusion

We can conclude from the ANOVA and ANOVA Post-Hoc regressions the following:

- ANOVA: The averages of shootings per race are different
- ANOVA Post-Hoc (White & Black): The averages of shootings are different
- ANOVA Post-Hoc (Black & Hispanic): The average of shootings are the same
- ANOVA Post-Hoc (Hispanic & White): The average of shootings are the same





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# Thank You!

