

Data Science Project Report

Analyzing Hate crimes in USA

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Problem statement:

Incidents of hate crimes have been on the rise in the United States- including vandalism, intimidation, assault and murder. Federal officials have recorded the highest number of hate-motivated killings in recent years.

Those who commit such heinous crimes have different motivations; sometimes they are motivated by religious discrimination, sometimes racial discrimination and sometimes from their hatred against people of different sexual orientations.

Data set:

The Federal Bureau of Investigation (FBI) has been collecting data related to hate crimes since the 1990s. In this project, we will be utilizing their datasets which is publicly accessible [here](#).

Specifically, we will be using data related to the number of hate crime offenses distributed by the known offender's race, ethnicity, and bias motivation. The other dataset presents state-wise data of hate crime incidents distributed by bias motivation. We collected 5 years of data (from 2013-2017) and compiled it into one dataset.

Moreover, we have also used the dataset for global terrorism which can be found [here](#). This dataset contains information on terrorist attacks around the world from 1970 through 2017, including systematic data on domestic as well as international terrorist incidents.

We have also used the dataset of the results for US elections 2016 which can be found [here](#). This dataset contains the total number of votes all presidential candidates received in general elections 2016 in every county of the United States.

Year	Anti-Multiple Religions, Group	Atheism/Agnosticism/etc.	Sexual Orientation:	Anti-Gay (Male)	Anti-Lesbian	Anti-Lesbian, Gay, Bisexual, or Transgender (Mixed Group)	Anti-Heterosexual	Anti-Bisexual
2015	51	7	1,402	849	185	317	24	27
2019	15	0	564	334	81	126	10	13
2014	7	2	329	208	41	73	3	4
2011	0	0	7	4	2	0	0	1
2010	0	0	11	9	1	1	0	0

To analyze hate crimes due to religious discrimination, other than the columns showing hate crimes motivated by anti-religious sentiment, all the other columns were dropped and the data frame was grouped by years and offenders.

The data was grouped yearly:

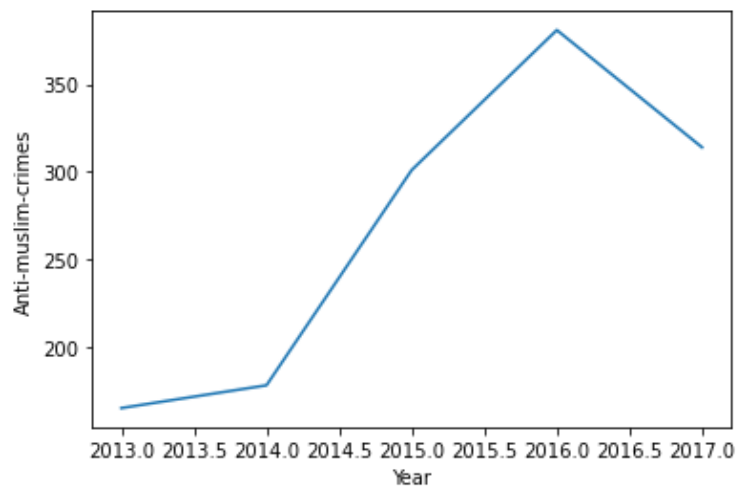
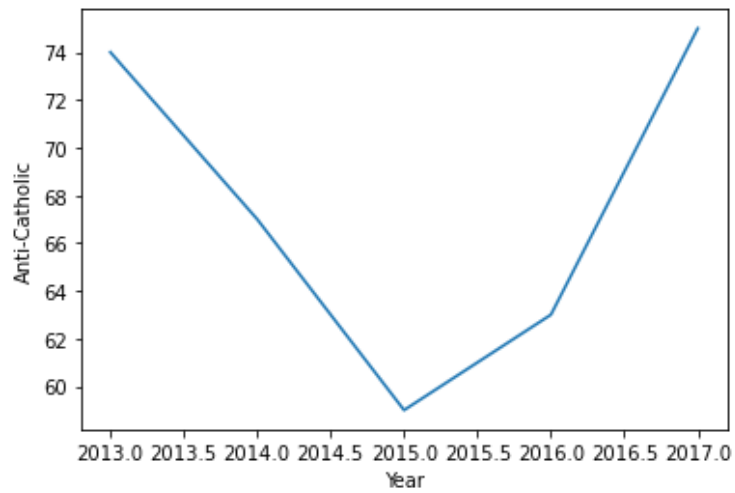
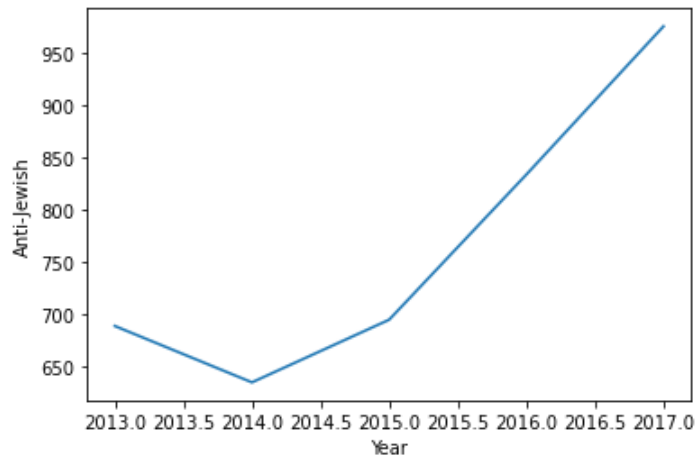
Year	Offender	Race/Ethnicity	Anti-Multiple Races, Group	Religion: Anti-Islamic (Muslim)	Anti-Multiple Religions, Group
2013	Total offences	4,201	109	1,163	165
2013	White	2,032	37	297	67
2013	Black or African American	649	8	68	20
2013	American Indian or Alaska Native	41	3	1	0
2013	Asian	25	0	0	0

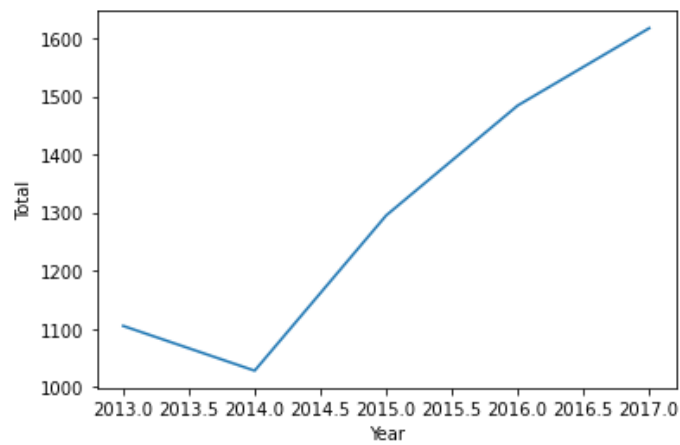
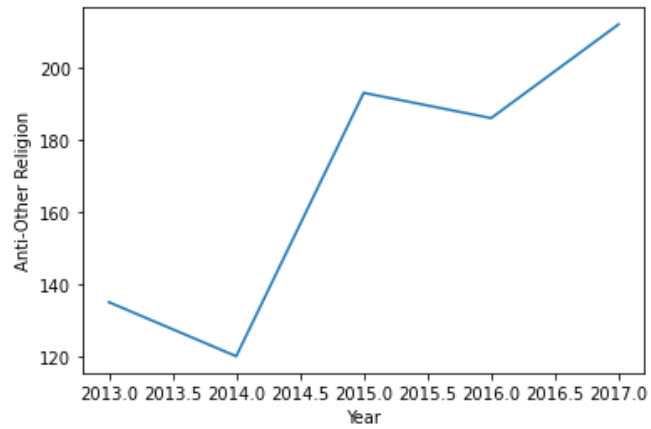
And, the dataset was grouped by type of offenders:

	Offender	Year	Anti-Multiple Races, Group	Anti- Jewish	Anti- Catholic	Anti- Protestant	Anti- Islamic (Muslim)	Anti- Other Religion	Anti-Multiple Religions, Group	Atheism/Agnosticism/etc.	Anti- Bisexual	SumTot
0	American Indian or Alaska Native	10075	3	4	1	0	7	2	1	0	10093	
1	Asian	10075	1	12	3	0	5	11	3	1	10111	
2	Black or African American	10075	84	146	19	11	136	61	31	5	10568	
3	Group of multiple races	8062	29	36	6	1	34	20	7	0	8195	
4	Group of multiple races	2013	0	4	2	0	16	0	0	0	2035	

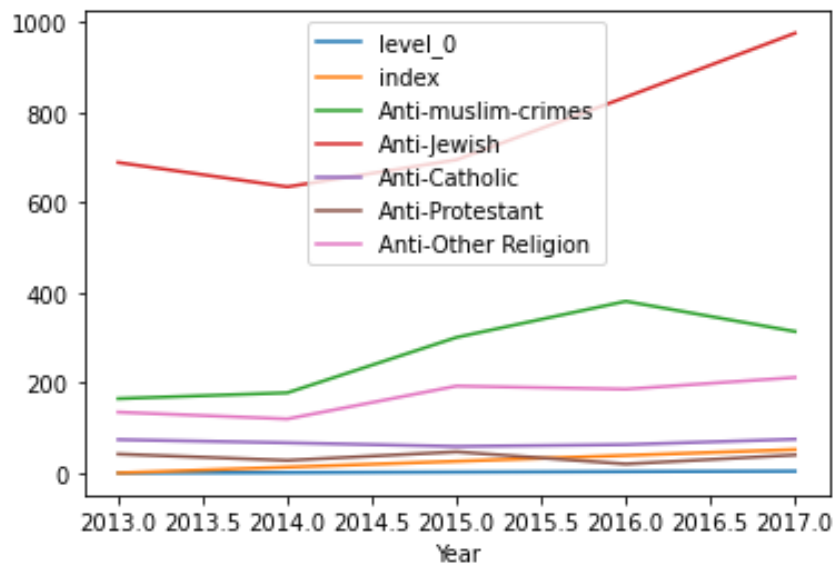
After cleaning and categorizing the dataset, EDA was performed.

Analyzing data year-wise:





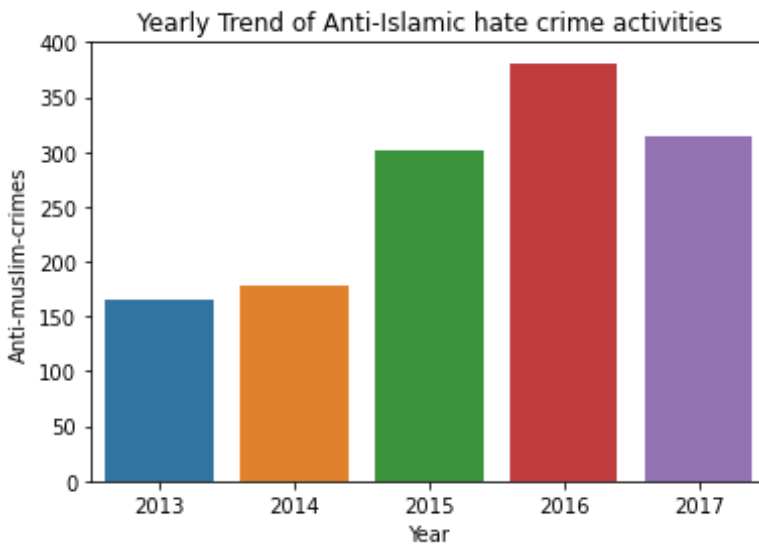
Graphs for all the religious-based hate crimes were plotted in order to compare them with the hate-crimes done against Muslims in the US from the year 2013 to 2017.



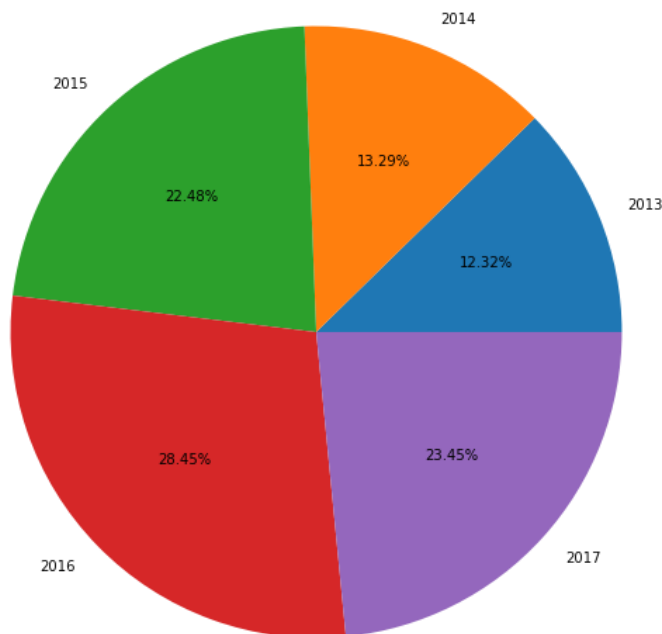
It can be seen that Hate crimes against American Jews and American Muslims are at an all-time high as compared with other religions in America. The offences have ranged from harassment and assault to homicide.

For the sake of simplicity, other than the column showing hate crimes against Muslims, all the other columns were dropped. This was done in order to understand the trend of anti-Muslim hate crimes in five years (2013-2017) and the potential offenders who were responsible for such acts.

In the graph given below, we can see the trend of the anti-Islamic hate-crimes from 2013 to 2017.

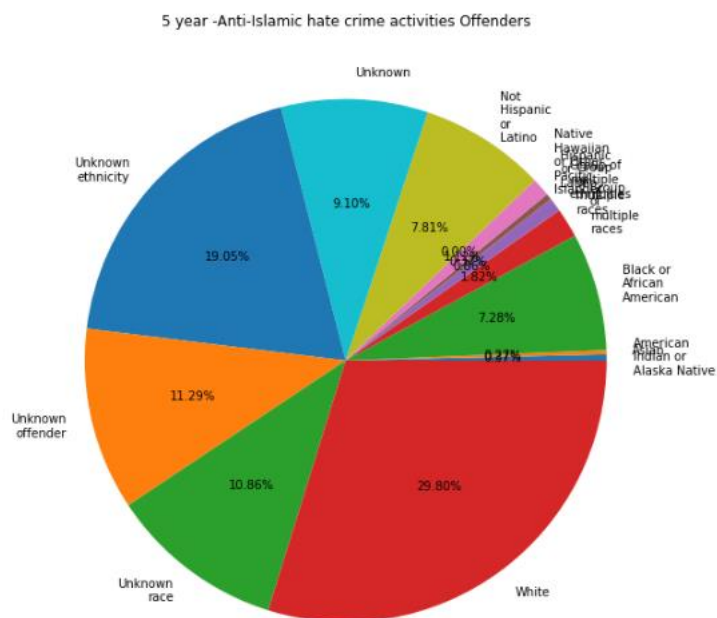
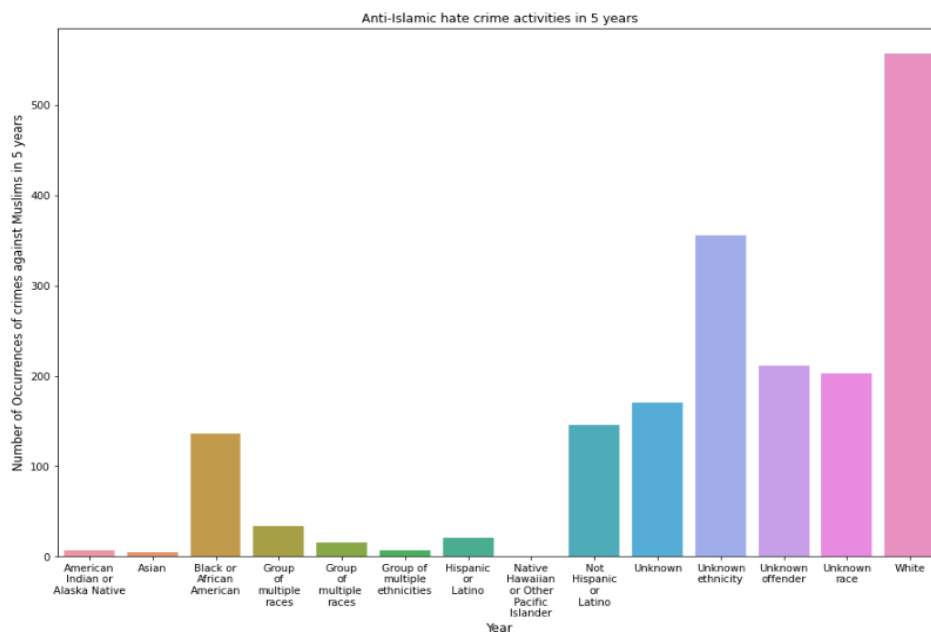


Yearly Anti-Islamic hate crime



These graphs show that hate crimes against Muslims spiked in the year 2016 i.e. about 30% of all the hate crimes against Muslims from 2013-2017 were committed in the year 2016. It can also be seen that hate-crimes were at their lowest in 2013, and have only accelerated up till the year 2016. However, there has been a slight decrease in Anti-Muslim hate crimes in the year 2017, making it the second-highest percentage out of all the years.

Analyzing data offender-wise:



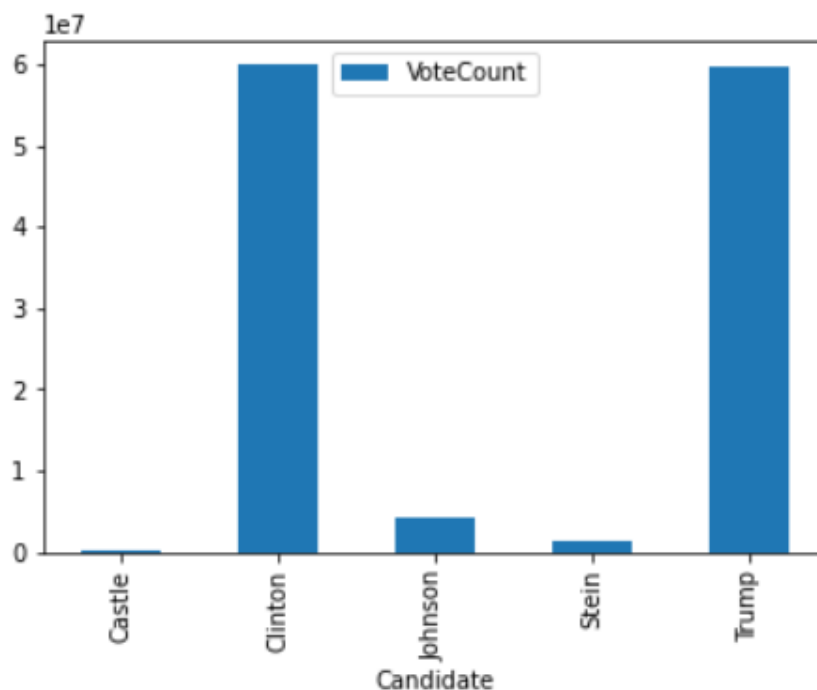
These graphs show the association between the race and type of offenders of hate crimes against Muslims.

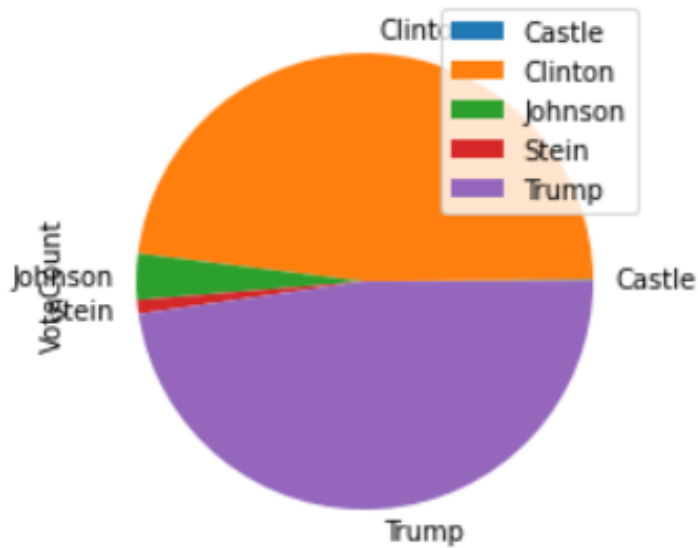
It can be seen that White people comprise of the largest percentage of offenders i.e. about 30% of all hate crimes against Muslims were committed by white people in the years 2013-2017, which clearly states that Islam is one of the most stigmatized religion especially among white people.

Hate crimes and Republican Voters:

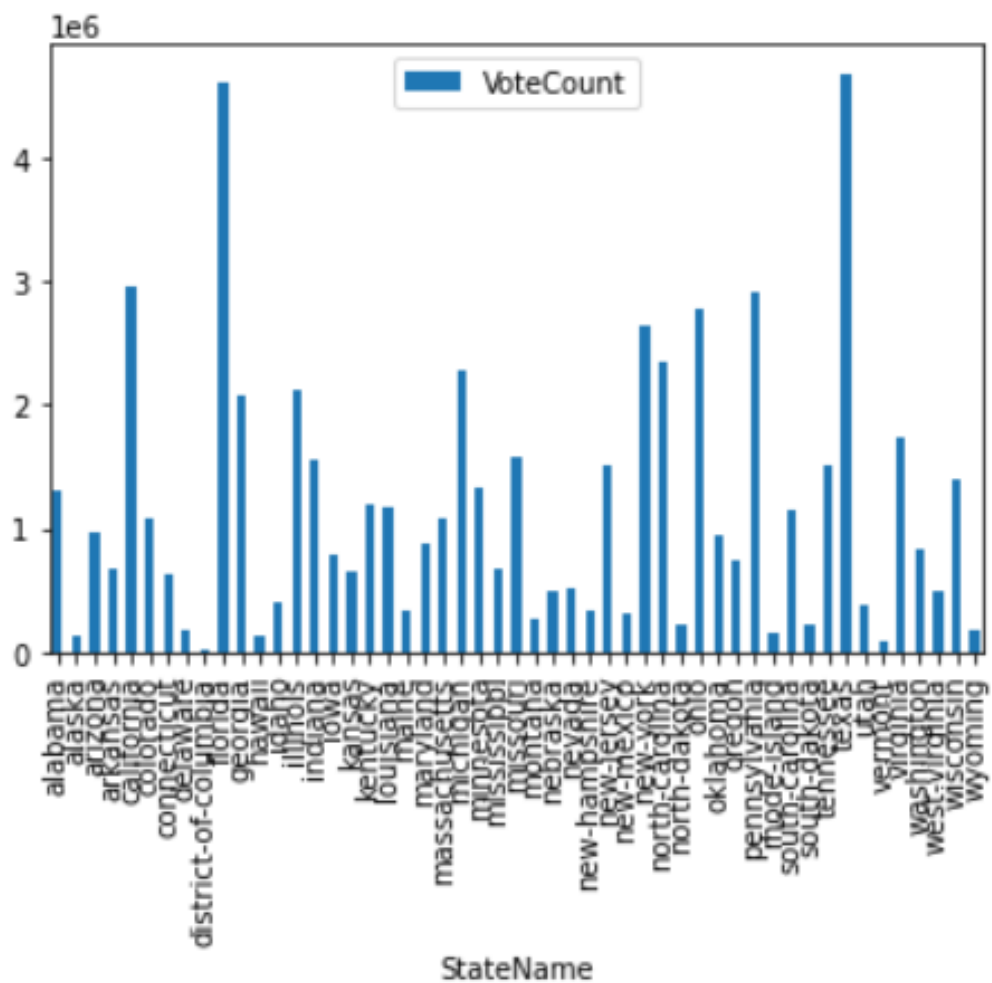
Seeing Trump's 2016 election campaign, one would assume that the states with most hate crimes would have the largest number of Trump voters, so to find out the correlation between Trump/Republican Voters and hate crimes, the hate crimes data set was first cleaned, so that only state wise data, from the years 2013-2017, could be analyzed.

On this data, EDA was performed to better understand the votes per candidate.





We also analyzed the data to find how many votes Trump received per state.



Now, in order to find a correlation between hate crimes and republican voters, we cleaned the data, keeping only records of votes where Party == 'GOP' (Grand old party i.e. the Republican party). We also removed the year 2017's data, since it was after the election and thus was not needed. We merged both the election data table and crime data table through join on the State. We then found the correlation between them.

	CountyFips	CountyTotalVote	VoteCount	VotePercent	Race/Ethnicity/Ancestry	Religion	Sexual orientation
CountyFips	1.000000	0.425591	0.532491	0.188413	0.084783	-0.046020	0.014014
CountyTotalVote	0.425591	1.000000	0.967243	-0.261360	0.555685	0.511730	0.582923
VoteCount	0.532491	0.967243	1.000000	-0.083217	0.430815	0.333392	0.416547
VotePercent	0.188413	-0.261360	-0.083217	1.000000	-0.352621	-0.464733	-0.432511
Race/Ethnicity/Ancestry	0.084783	0.555685	0.430815	-0.352621	1.000000	0.905595	0.934763
Religion	-0.046020	0.511730	0.333392	-0.464733	0.905595	1.000000	0.978510
Sexual orientation	0.014014	0.582923	0.416547	-0.432511	0.934763	0.978510	1.000000

To find the correlation between states where Trump got the most votes, we performed EDA on the data, and got the data of states where Trump won. We also combined it with the hate crime data 2013-2016 of those states only.

	State	Race/Ethnicity/Ancestry	Religion	Sexual orientation	Index	StateName	Candidate	CountyFips	CountyTotalVote	VoteCount	VotePercent
0	alabama	33.0	2.0	3.0	4	alabama	Trump	71489	2078165	1306925.0	62.888414
1	alaska	31.0	0.0	2.0	9	alaska	Trump	2000	246588	130415.0	52.887813
2	arizona	537.0	170.0	192.0	14	arizona	Trump	60208	1960053	972900.0	49.636413
3	arkansas	38.0	2.0	11.0	19	arkansas	Trump	380625	1121684	677904.0	60.436273
8	florida	175.0	52.0	78.0	49	florida	Trump	808550	9386750	4605515.0	49.064000
9	georgia	115.0	15.0	48.0	54	georgia	Trump	2092677	4029564	2068623.0	51.336150
10	idaho	72.0	27.0	17.0	64	idaho	Trump	705936	688235	407199.0	59.165692
12	indiana	186.0	32.0	47.0	74	indiana	Trump	1664464	2717840	1555020.0	57.215289
13	iowa	32.0	4.0	6.0	79	iowa	Trump	1890801	1542880	798923.0	51.781279
14	kansas	179.0	27.0	36.0	84	kansas	Trump	2111025	1147143	656009.0	57.186332
15	kentucky	502.0	114.0	91.0	89	kentucky	Trump	2534400	1923346	1202942.0	62.544233
16	louisiana	53.0	20.0	22.0	94	louisiana	Trump	1412096	2027731	1178004.0	58.094688
20	michigan	935.0	171.0	201.0	114	michigan	Trump	2164889	4789450	2279210.0	47.588136
22	mississippi	8.0	1.0	3.0	124	mississippi	Trump	2302724	1162607	677782.0	58.298462
23	missouri	242.0	53.0	58.0	129	missouri	Trump	3348537	2775098	1585753.0	57.142234
24	montana	85.0	24.0	12.0	134	montana	Trump	1683136	484319	273696.0	56.511514
25	nebraska	92.0	11.0	28.0	139	nebraska	Trump	2891649	805638	485819.0	60.302394
27	ohio	1213.0	117.0	248.0	179	ohio	Trump	3439744	5325395	2771984.0	52.052176
28	oklahoma	90.0	20.0	29.0	184	oklahoma	Trump	3085929	1451056	947934.0	65.327182
30	pennsylvania	166.0	40.0	31.0	194	pennsylvania	Trump	2818489	5970107	2912941.0	48.792107
31	tennessee	545.0	68.0	109.0	214	tennessee	Trump	4474025	2484691	1517402.0	61.070049
32	texas	373.0	85.0	162.0	219	texas	Trump	12256516	8903237	4681590.0	52.583010
33	utah	160.0	46.0	27.0	224	utah	Trump	1421841	801248	375006.0	46.802738

We then found correlation between them.

	Race/Ethnicity/Ancestry	Religion	Sexual orientation	index	CountyFips	CountyTotalVote	VoteCount	VotePercent
Race/Ethnicity/Ancestry	1.000000	0.857631	0.937570	0.154427	0.252956	0.398845	0.401320	-0.299477
Religion	0.857631	1.000000	0.908710	0.036105	0.208795	0.399533	0.391126	-0.391572
Sexual orientation	0.937570	0.908710	1.000000	0.108700	0.377441	0.545556	0.547596	-0.380575
index	0.154427	0.036105	0.108700	1.000000	0.576765	0.131821	0.131679	0.018985
CountyFips	0.252956	0.208795	0.377441	0.576765	1.000000	0.529962	0.564589	-0.098337
CountyTotalVote	0.398845	0.399533	0.545556	0.131821	0.529962	1.000000	0.995667	-0.490029
VoteCount	0.401320	0.391126	0.547596	0.131679	0.564589	0.995667	1.000000	-0.431324
VotePercent	-0.299477	-0.391572	-0.380575	0.018985	-0.098337	-0.490029	-0.431324	1.000000

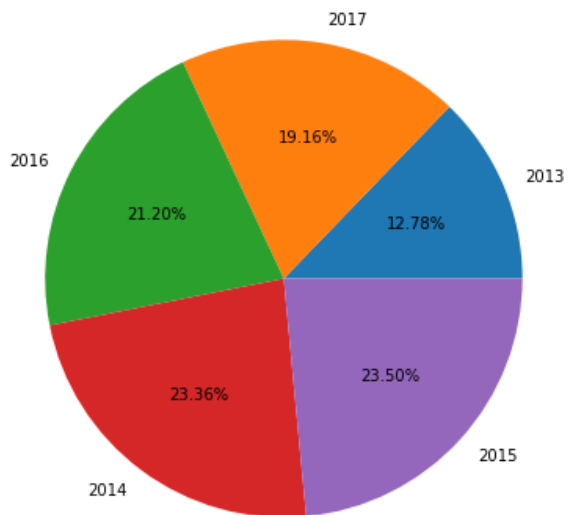
Hate crimes and militant Jihad:

To find out the correlation between militant Jihadi terrorist activities and hate crimes in the USA, the terrorism data set was first cleansed so that only the acts done by the following organizations could be analyzed:

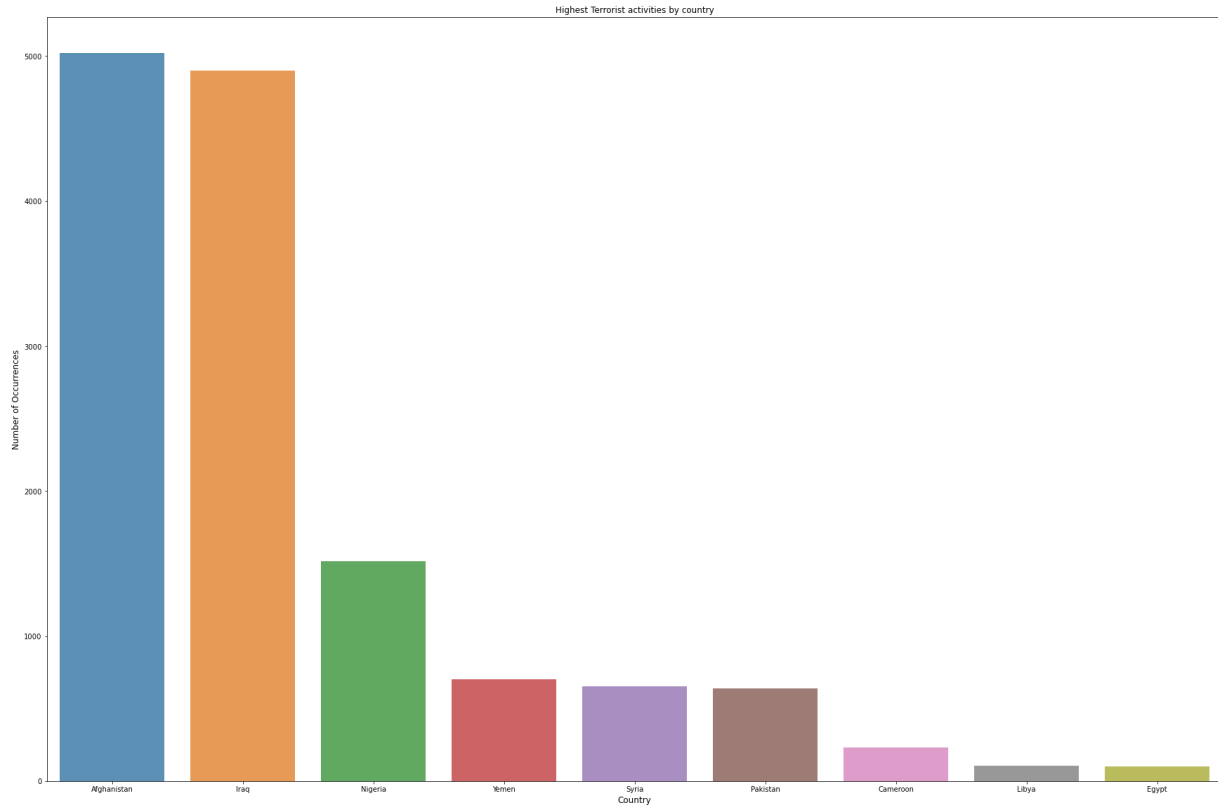
1. Boko Haram
2. Al-Qaida in Iraq
3. Al-Qaida in the Arabian Peninsula (AQAP)
4. Al-Qaida in the Indian Subcontinent
5. Al-Qaida in the Islamic Maghreb (AQIM)
6. Taliban
7. Tehrik-i-Taliban Pakistan (TTP)
8. Islamic State of Iraq and the Levant (ISIL)
9. Jihadi-inspired extremists
10. Muslim extremists

According to the [Global Terrorism Index](#), these organizations were responsible for 74% of all deaths from Islamic terrorism in 61 different countries.

On this data, EDA was performed to show number of occurrences of Islamic terrorism worldwide by year.

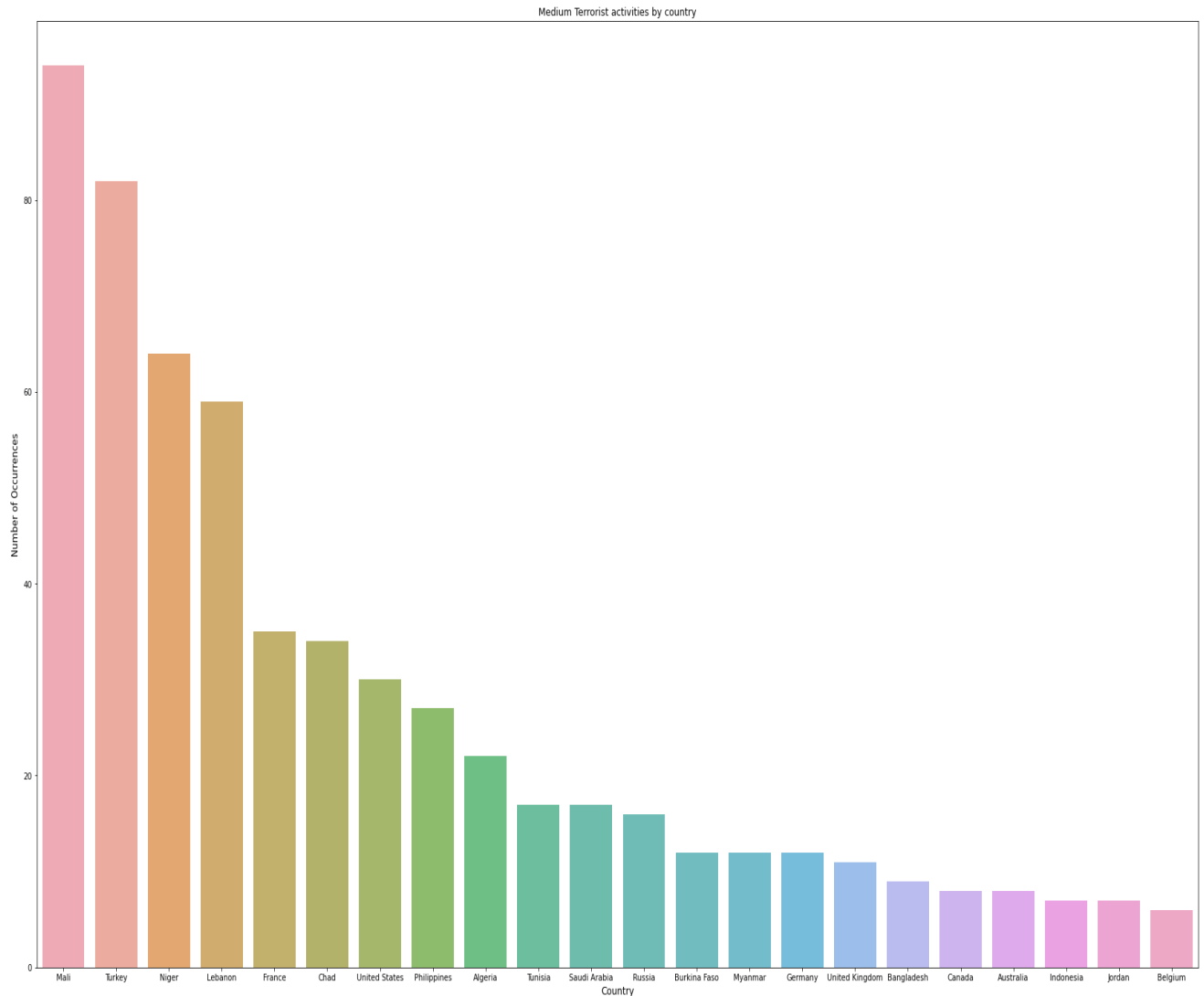


The countries with the highest number of terrorist activities were also plotted:



As can be seen the countries with the highest number of terrorist activities are mostly Muslim countries in the Middle East, Africa and South-East Asia.

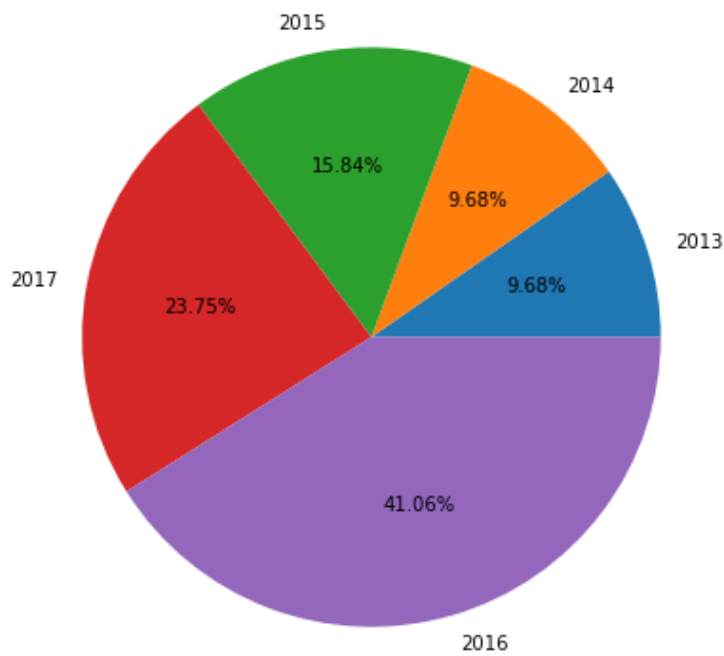
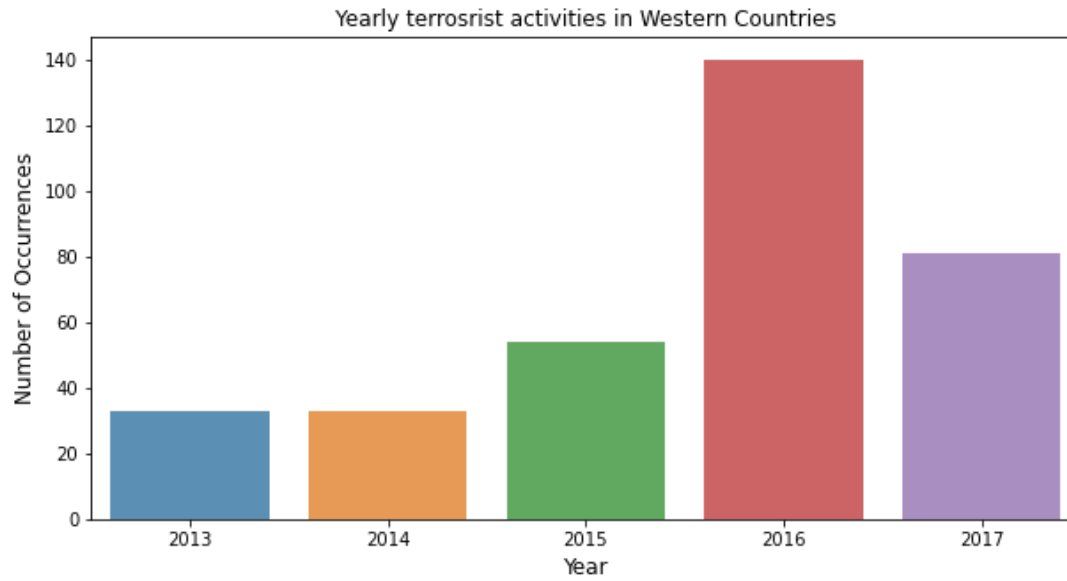
Countries in the West had relatively less terrorist acts as can be seen from the chart below:



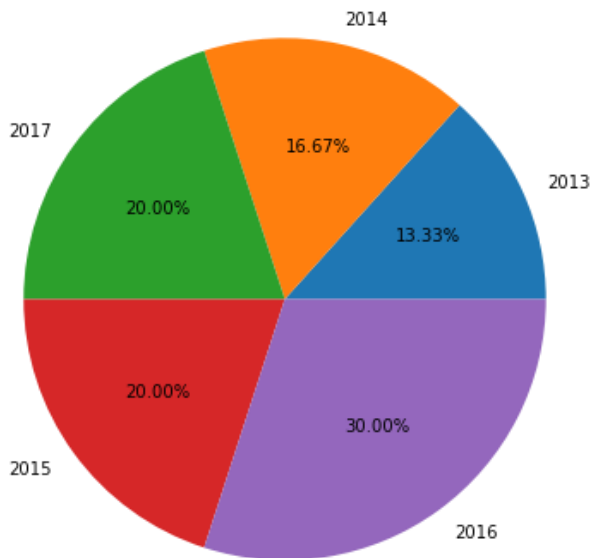
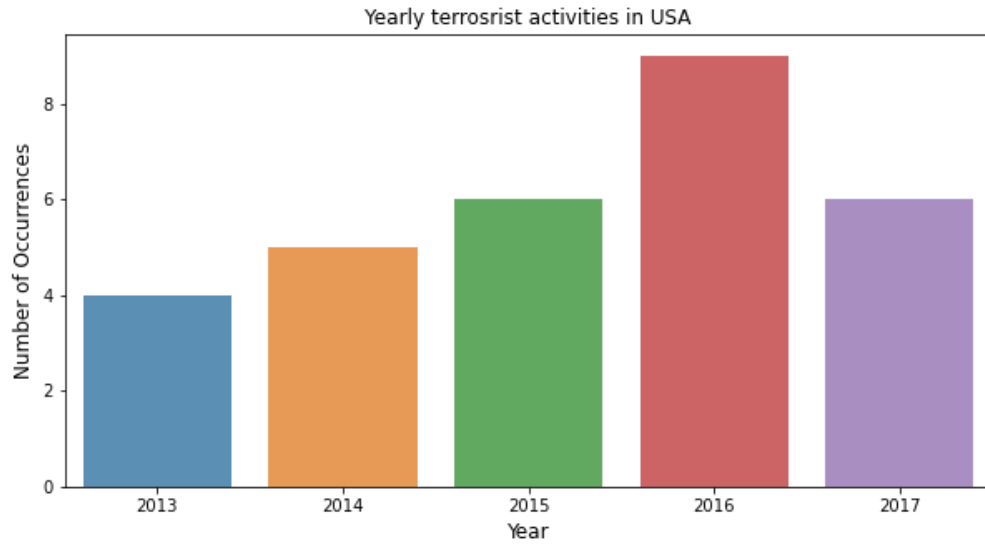
Hence, in order to analyze the correlation between terrorist activities and hate crimes in the USA, we need to use data related to Western countries and countries where terrorist activities were rarer.

Hence, we cleaned the data further so that it will now contain terrorism related activities only in western countries and other parts of the world where such acts were less common.

One we did that, after performing EDA, yearly terrorist trends changed:



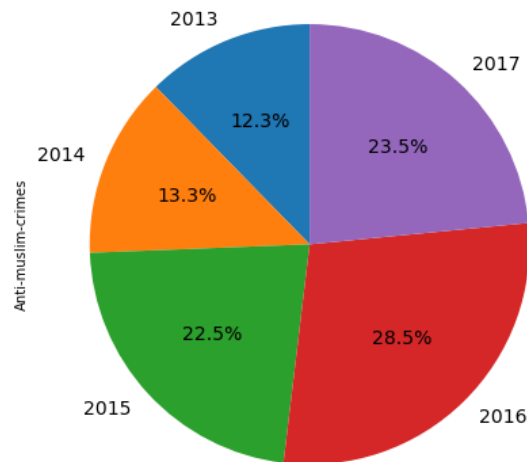
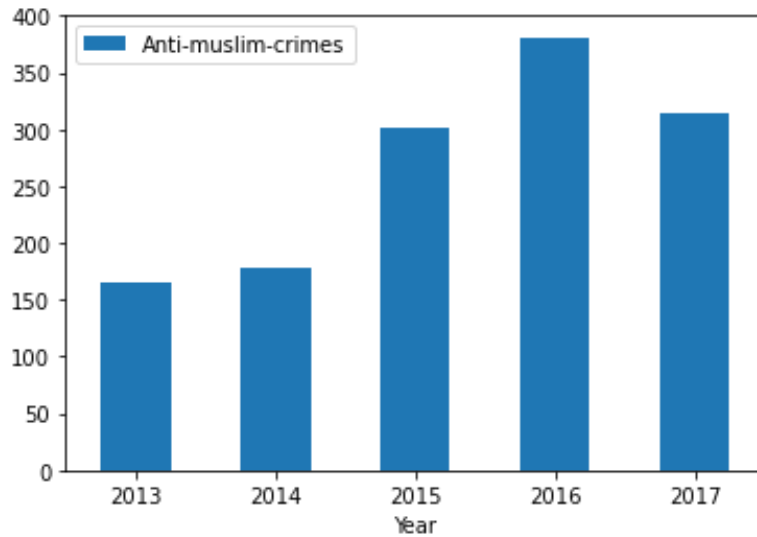
Furthermore, if we analyze data for terrorist activities in the United States only, we see the following trends:



This trend seems similar to the trend of terrorism in western countries.

Next, we used our hate crimes in US data and reduced it so that total hate crimes committed against Muslims only from 2013 to 2017 can be studied.

After performing EDA, we got the following charts:



	Year	Offender	Anti-muslim-crimes
0	2013	Total offences	165
13	2014	Total offences	178
26	2015	Total offences	301
39	2016	Total offences	381
52	2017	Total offences	314

The results from all datasets were combined into a single data frame that would represent total number of Anti-Muslim hate crimes, Terrorist acts in the West and Terrorist acts in the USA from 2013 to 2017.

	Year	Offender	Anti-muslim-crimes	Terrorist Acts in West	Terrorist Acts in US	Terrorist Acts worldwide
0	2013	Total offences	165	33	4	1858
13	2014	Total offences	178	33	5	3395
26	2015	Total offences	301	54	6	3415
39	2016	Total offences	381	140	9	3081
52	2017	Total offences	314	81	6	2784

We then tried to find the correlation between anti-Muslim hate crimes and terrorism in the west and in the USA.

	Year	Anti-muslim-crimes	Terrorist Acts in West	Terrorist Acts in US	Terrorist Acts worldwide
Year	1.000000	0.850708	0.717767	0.676123	0.379549
Anti-muslim-crimes	0.850708	1.000000	0.902212	0.911282	0.397646
Terrorist Acts in West	0.717767	0.902212	1.000000	0.959243	0.204638
Terrorist Acts in US	0.676123	0.911282	0.959243	1.000000	0.444667
Terrorist Acts worldwide	0.379549	0.397646	0.204638	0.444667	1.000000

Outcome of the analysis:

Hate crimes 2013-2017:

Hate crimes have been on the rise in the United States even as the overall crime rate has dropped. This shows that prejudices and stereotypes continue to exist even as technological advancements, economic growth and awareness of facts contrary to stereotypes portrayed by alt-right media is created through the internet to curb the illogical thinking surrounding such heinous offences.

The data shows that recorded anti-Islamic hate crimes in the United States jumped dramatically after 2013. Anti-Islamic hate crimes then subsided but continued at a significantly higher pace till 2017. In contrast to total hate crimes and overall crime in the U.S. since 2013, hate crimes against Muslims especially have risen the highest. And the primary offenders are white people.

Hate crimes and Republican Voters:

By the studying the correlation coefficients and heat maps created for the above tables, we can conclude that unlike our assumption that there would be a very high correlation between hate crimes in US and trump votes, there is a fairly low correlation.

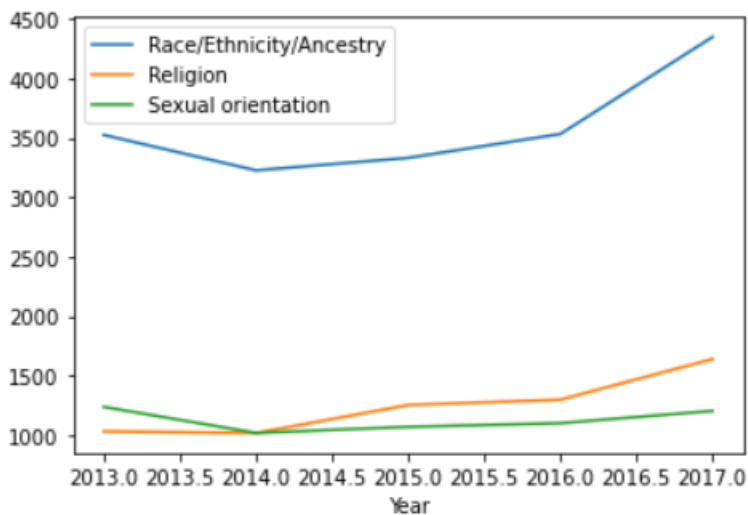
Upon research, the answer to the low correlation was found in the report -

<https://www.voterstudygroup.org/publication/the-five-types-trump-voters#share-content>

According to this article, there are up to five different types of Trump voters, and only one group among them is mostly involved in committing these hate crimes – the Staunch Conservatives.

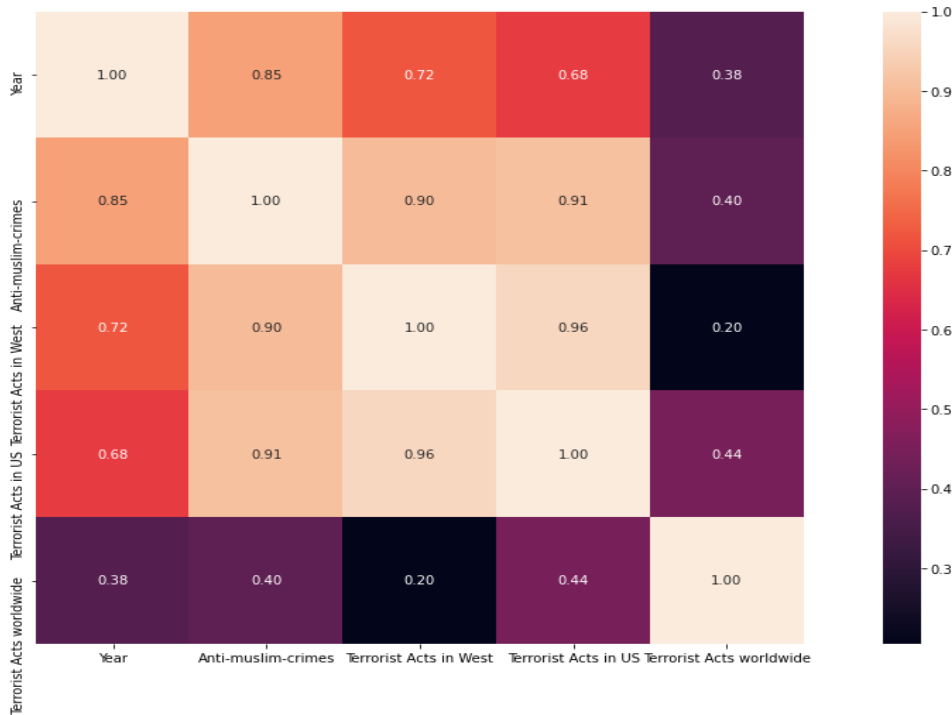
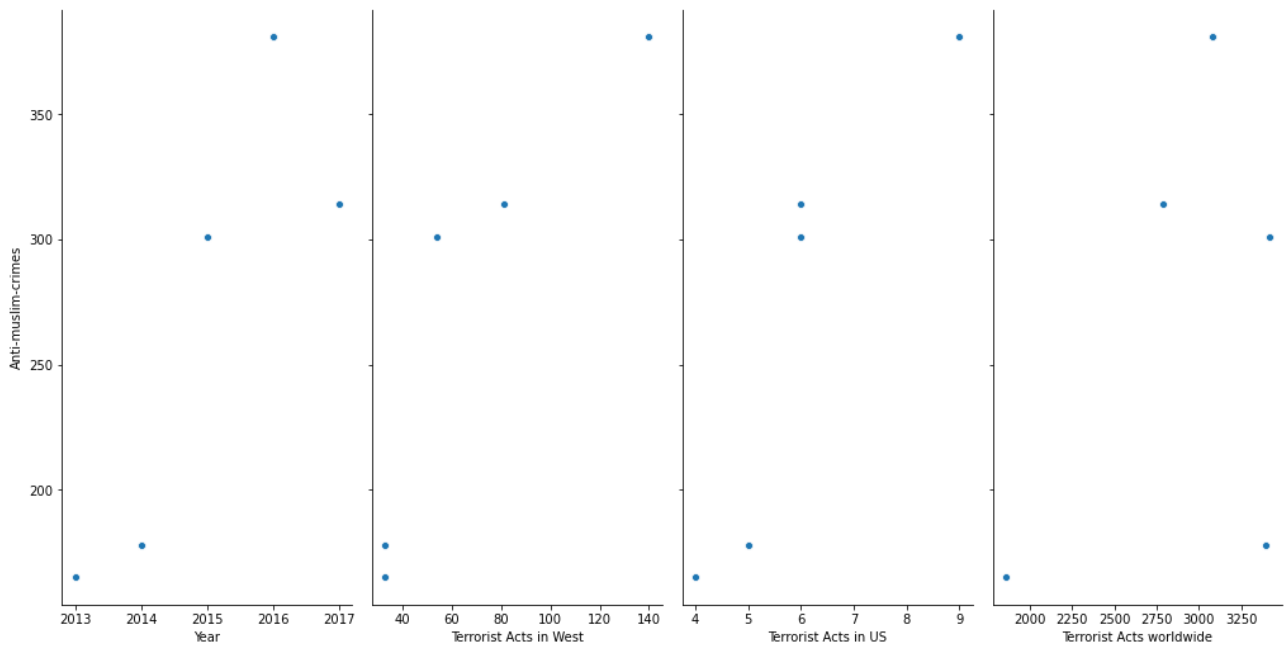


Despite a lower correlation between hate crimes and trump voters than expected, the hate crimes did increase in the year after Trump came into power. The line graph shows that racial hate crimes and religious hate crimes increased in 2017 more than ever, during the 2013-2017 period. Sexual orientation related crimes also show a slight increase.



Hate crimes and militant Jihad:

By studying the correlation coefficients, scatter plot matrix and heatmap created from the table showing hate crimes against Muslims and terrorism in the West, we can conclude that there is a very high correlation between hate crimes against Muslims in the US and Terrorist activities in the US and in the West.



The conclusion can be explained by the fact that such incidents incite people to lash out against those who superficially might seem similar to those who commit terrorist acts, e.g. Muslims, Arabs, South Asians living in the United States. Furthermore, since the news agencies repeatedly use terms of Islamic terrorism, it is very easy for people to think that those who practice Islam must be supporting such militant Jihadi groups and hence are motivated to commit crimes against them.

References:

United States Department of Justice, Federal Bureau of Investigation. (November 2017). Hate Crime Statistics, 2016. Retrieved (2.12.20), from (<https://ucr.fbi.gov/hate-crime>).

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