TRAFFIC SIGNALS AND TRAFFIC VIOLATIONS IN THE CITY OF COLOGNE.

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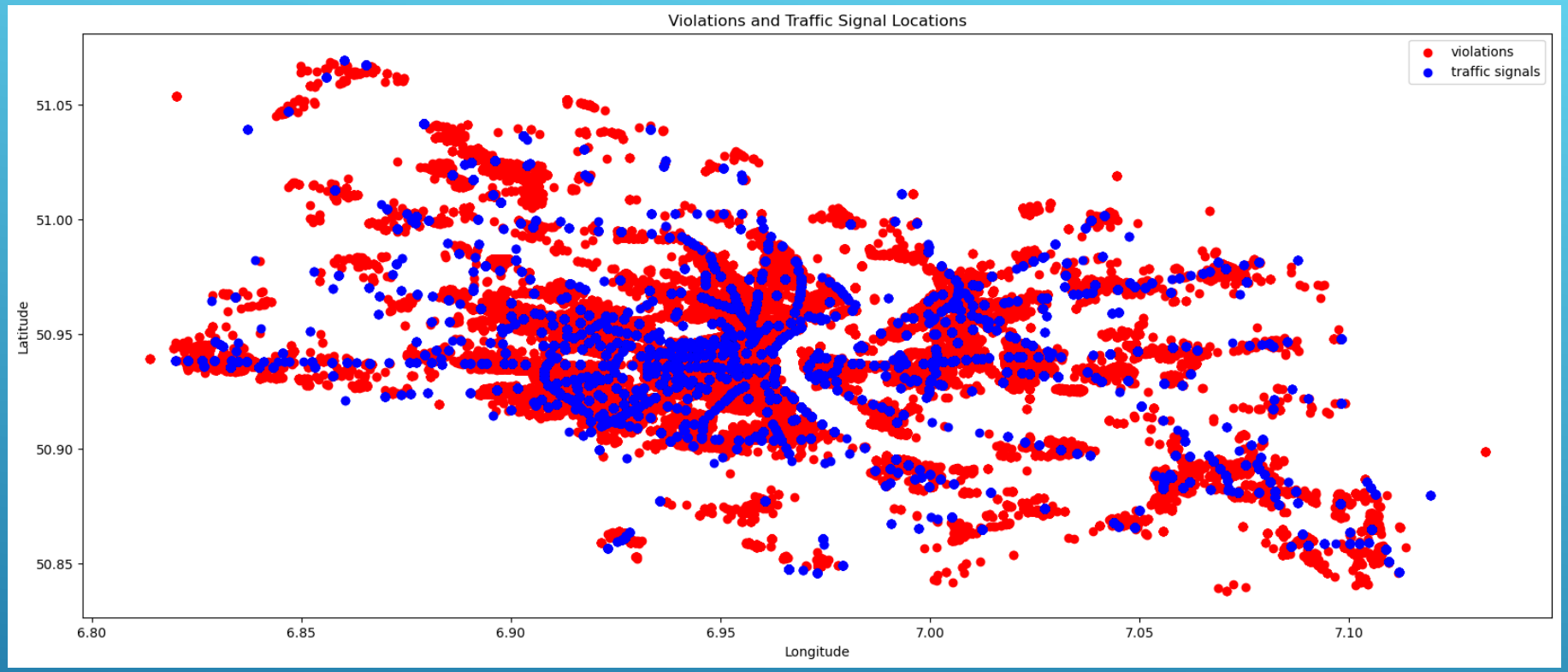
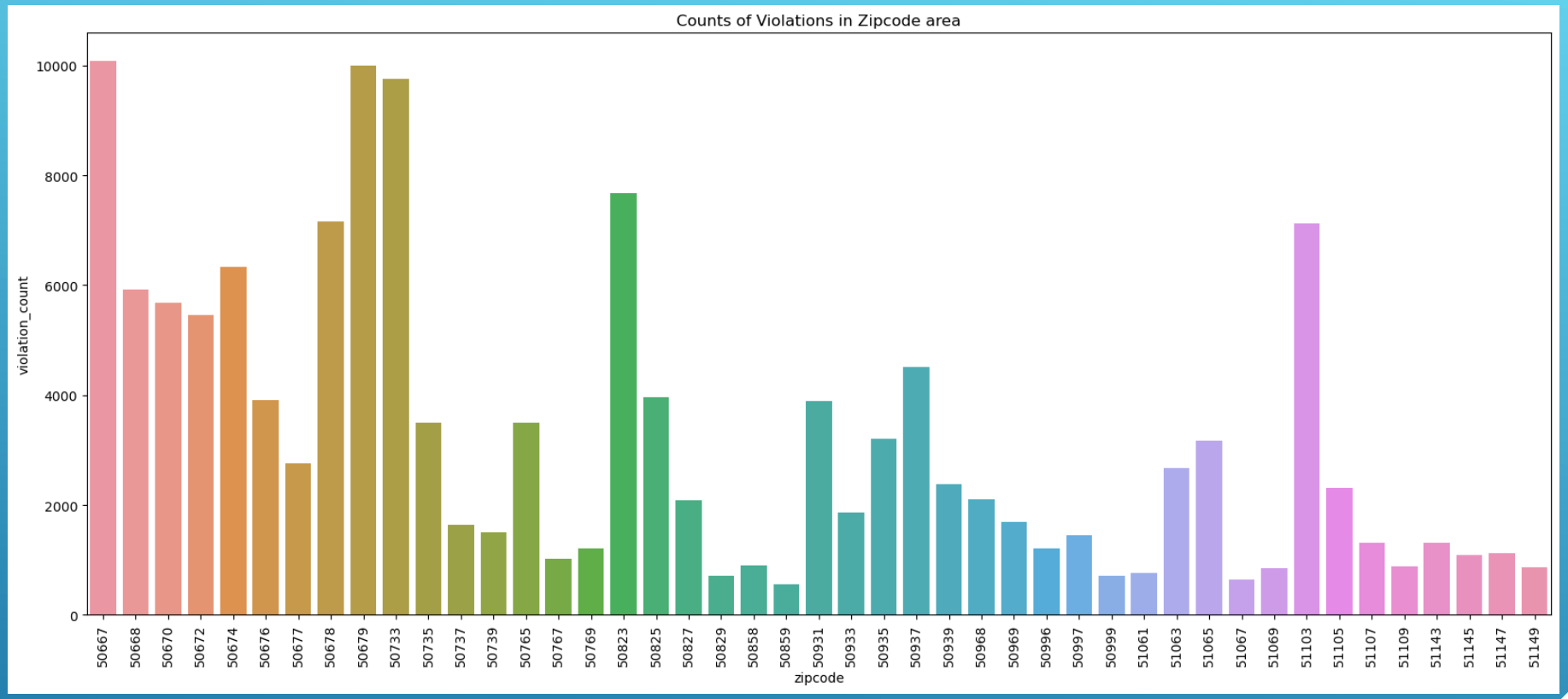
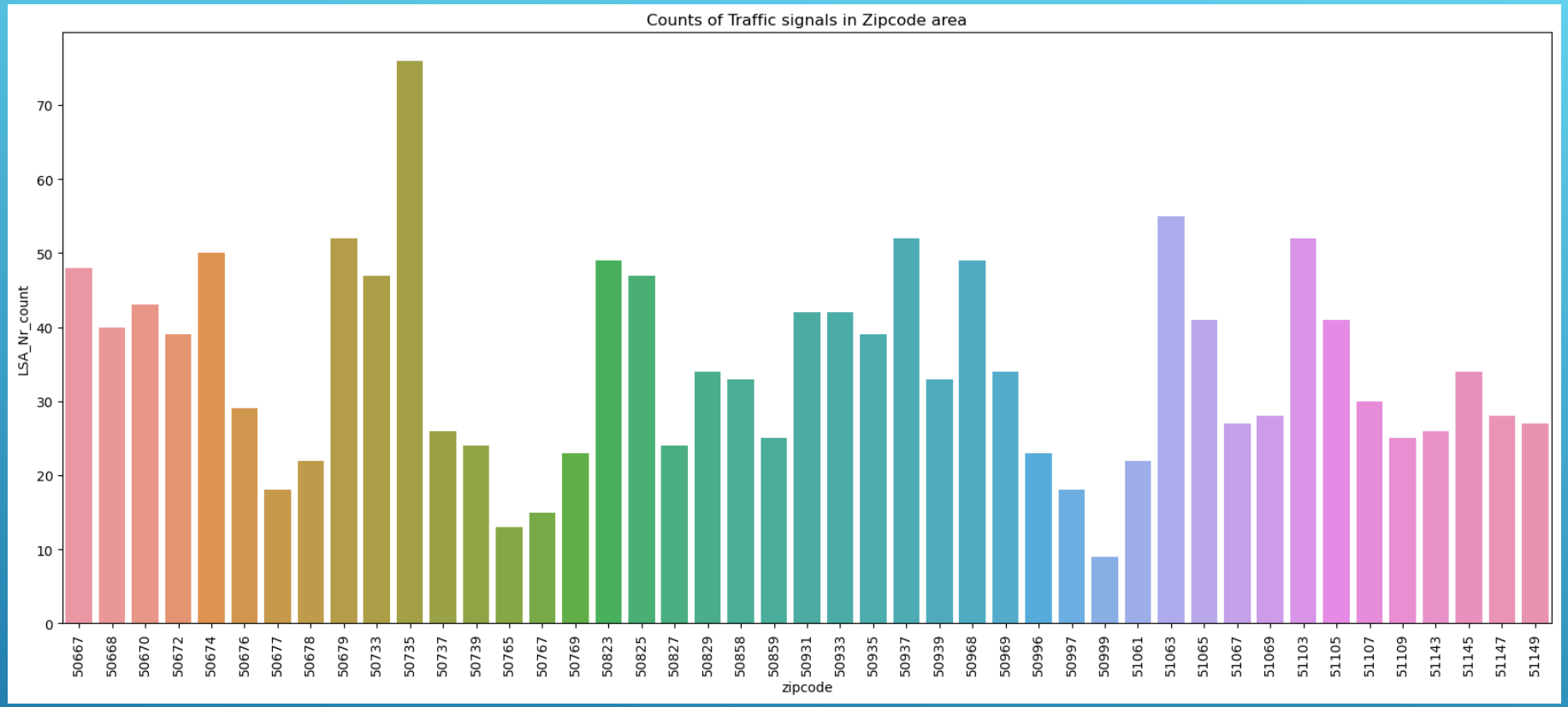
Subject: AMSE/SAKI



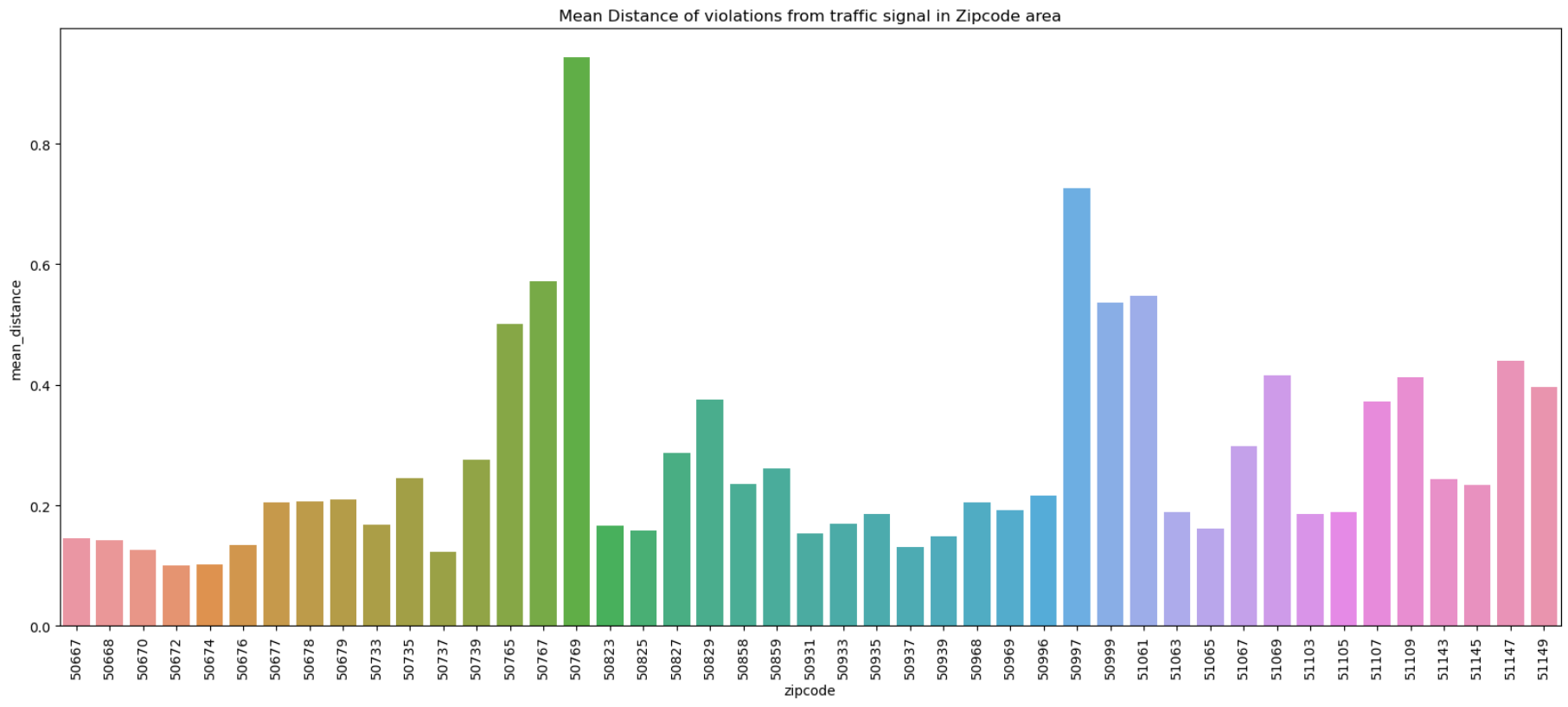
SPATIAL GRAPH OF VIOLATIONS AND TRAFFIC SIGNALS



VIOLATION COUNTS



TRAFFIC SIGNAL COUNTS



MEAN DISTANCE OF VIOLATION FROM TRAFFIC SIGNAL

HYPOTHESIS 1

Null hypothesis (H0): *There is no difference in the number of violations between zip codes with different distances from the signal.*

v/s

Alternative hypothesis (Ha): *There is a significant difference in the number of violations between areas with larger and shorter distances from the signal.*

STATISTICS AND CONCLUSION

Statistic:

Correlation: *-0.47*
T-Statistic: *-4.235628718167968*
P-Value: *0.00011791274803307264*

Decision:

Reject the null hypothesis

Conclusion:

The correlation analysis suggests the negative correlation between the mean distance of the violation from traffic signal and number of violations. The mean violations in the group with larger distance from traffic signal(1691) is less that group with shorter distance(4578). This difference is statistically significant as well. We can therefore conclude that the traffic signals are responsible for catching the violations more efficiently in its vicinity.

HYPOTHESIS 2

Null hypothesis (H0): *There is no difference in the number of violations between zip codes despite of signal count.*

v/s

Alternative hypothesis (Ha): *There is a significant difference in the number of violations between areas with more traffic signals vs less traffic signals.*

STATISTICS AND CONCLUSION

Statistic:

***Correlation**: 0.55*
***T-Statistic**: 4.348536518952554*
***P-Value**: 8.264037986938899e-05*

Decision:

Reject the null hypothesis

Conclusion:

The correlation analysis suggests the positive correlation between the number of traffic signals and number of violations. The mean violations in the group with more traffic signals(4670) is more than the group with less traffic signals(1729). This difference is statistically significant as well. We can therefore conclude that the traffic signals are responsible for catching the violations more efficiently.

FURTHER OUTLOOK

We can summarize that the presence of higher number of traffic signals in area results in catching more traffic violations. Also the traffic signals are more efficient in catching traffic violations in its close vicinity. This is probably because of the presence of camera and high vehicle density around traffic signals. Also, there is high chance of breaking the traffic signals which may result in adding the count of traffic violations very close to the traffic signal.

The less traffic violations are not necessarily the indicators that there is no violation incident. It is more or less associated to the inability to catch the violations due to low checks. The addition of monitoring devices in such locations could help in understanding it better.

Both the Hypotheses could make us understand the importance of having checks over the traffic flow in order to maintain the discipline. This can be further analyzed by adding more data and using advanced Data Science algorithms.

THANK YOU