

# AIR QUALITY MONITORING

## Phase 2: Innovation

Consider incorporating predictive modeling to forecast air quality trends based on historical data.

## Content

This data is combined (across the years and states) and largely clean version of the Historical Daily Ambient Air Quality Data released by the Ministry of Environment and Forests and Central Pollution Control Board of India under the National Data Sharing and Accessibility Policy (NDSAP).

Visualization of the Mean RSPM values over the years



# INDIAN AIR QUALITY ANALYSIS

S. no	TN CO DE	Samplin g Data	State	Location	A g e n c y	Type	so2	no2	rs pm	sp m	l s m	pm 2_5	Date
0	150	February M02199 0	Andhra Pradesh	Hyderabad	0	Residential, Rural and Other Areas	4.8	17.4	0.0	0.0	0	0.0	02.01.1990
1	151	February M02199 0	Andhra Pradesh	Hyderabad	0	Industrial Area	3.1	7.0	0.0	0.0	0	0.0	02.01.1990
2	152	February M02199 0	Andhra Pradesh	Hyderabad	0	Residential, Rural and Other Areas	6.2	28.5	0.0	0.0	0	0.0	02.01.1990
3	150	March M03199 0	Andhra Pradesh	Hyderabad	0	Residential, Rural and Other Areas	6.3	14.7	0.0	0.0	0	0.0	03.01.1990
4	151	March M03199 0	Andhra Pradesh	Hyderabad	0	Industrial Area	4.7	7.5	0.0	0.0	0	0.0	03.01.1990

s.no	so2	si
0	4.8	6.000
1	3.1	3.875
2	6.2	7.750
3	6.3	7.875

s.no	so2	si
0	4.8	6.000
1	3.1	3.875
4	4.7	5.875

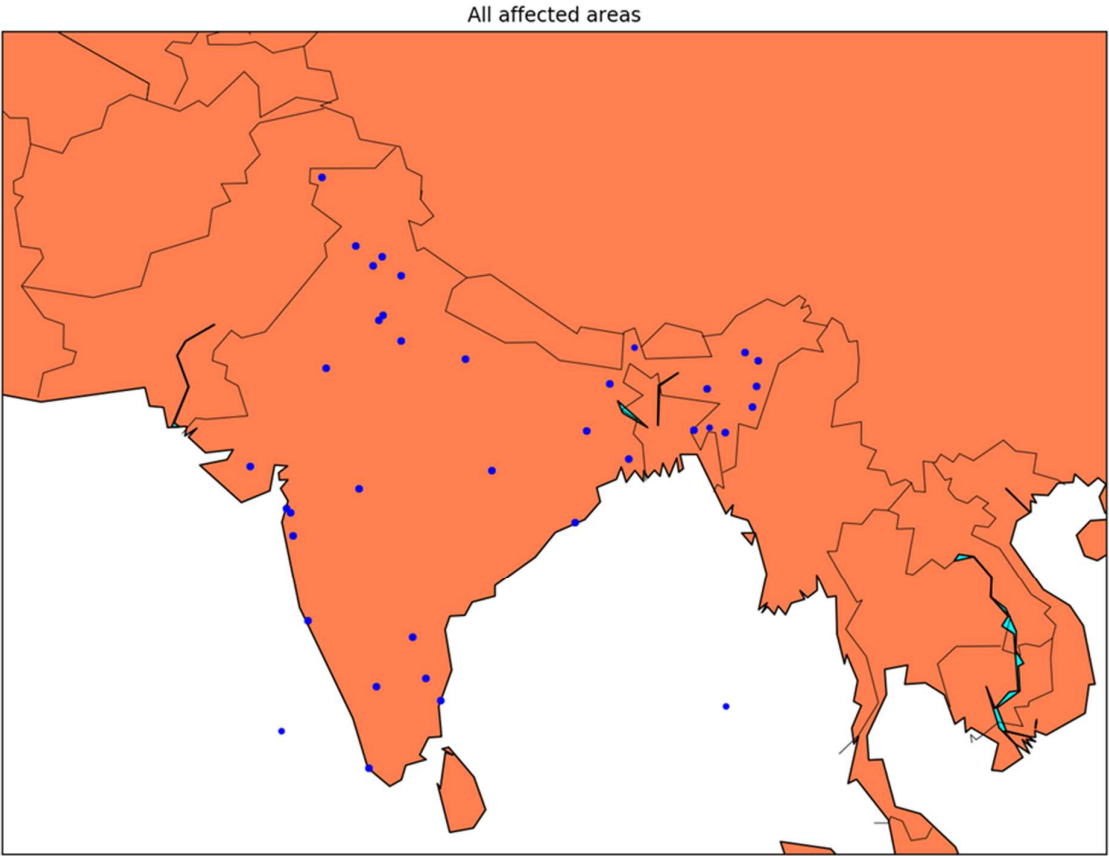
s.no	no2	ni
0	17.4	21.750
1	7.0	8.750
2	28.5	35.625
3	14.7	18.375
4	7.5	9.375

s.no	spm	spi
0	435737	1212
1	435738	130
2	435739	141
3	435740	151
4	435741	161

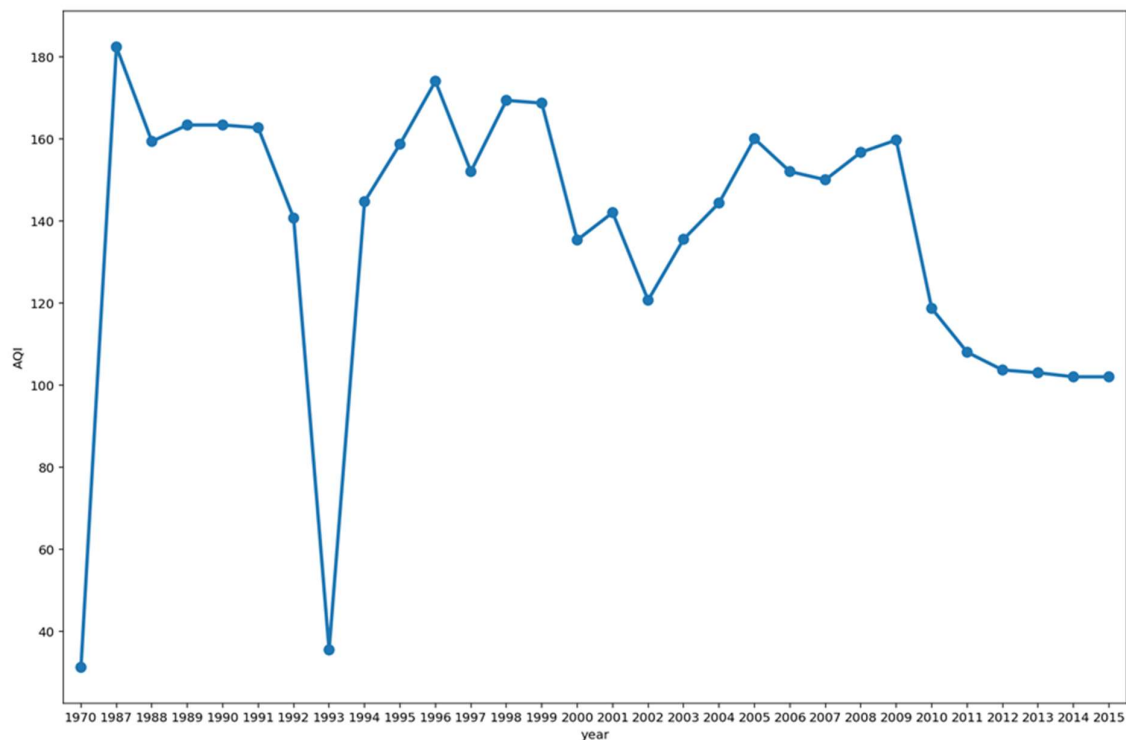
s.no	Sampling data	State	si	ni	rpi	spi	AQI
0	February-M021990	Andhra Pradesh	6.0	21.7	0	0	21.7
1	February-M021990	Andhra Pradesh	3.8	8.7	0	0	8.7
2	February-	Andhra	7.7	35.6	0	0	35.6

	M021990	Pradesh					
3	February-M031990	Andhra Pradesh	7.8	18.3	0	0	18.3

**ALL AFFECTED AREAS**



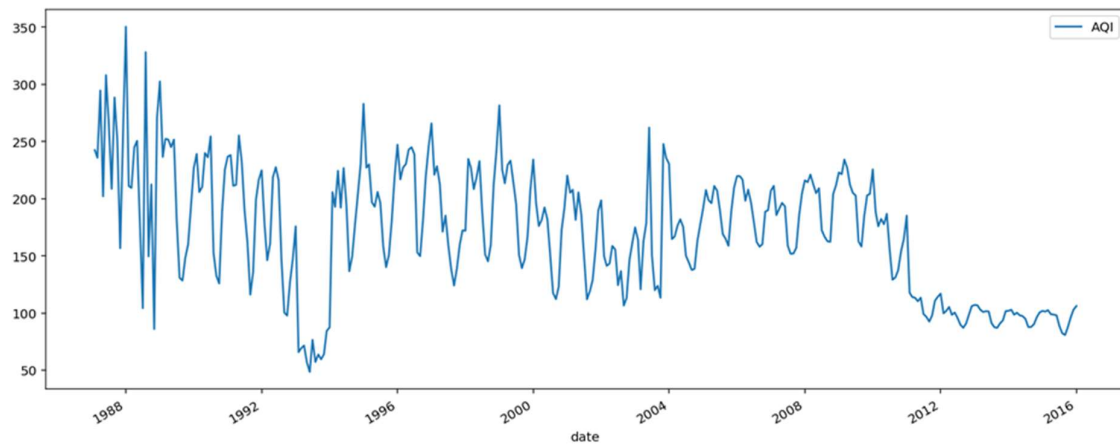
# Visualization of AQI across india



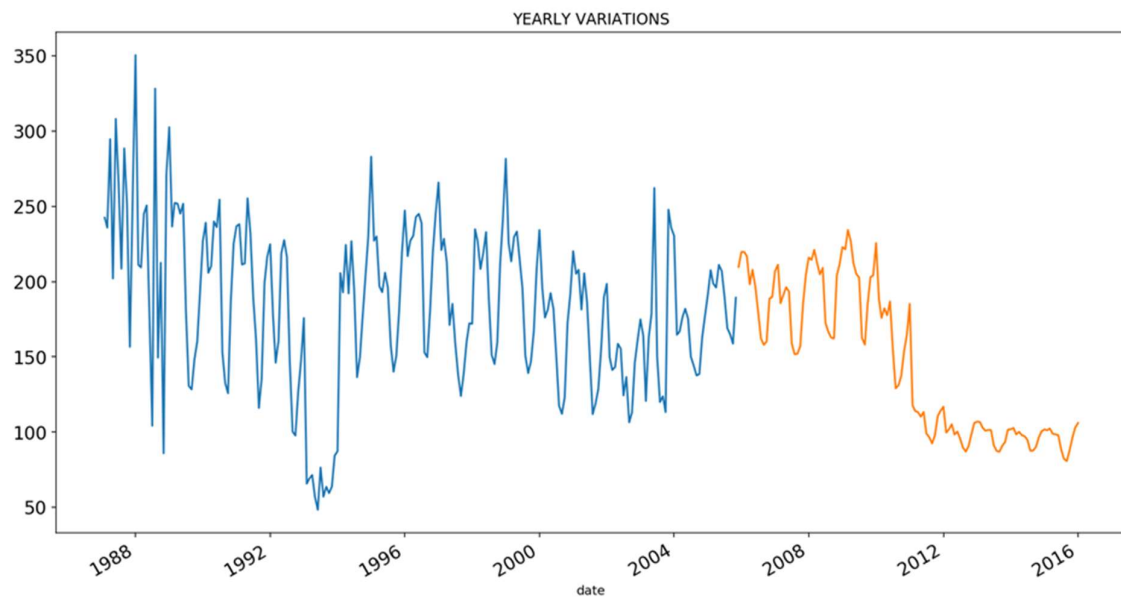
S.no	AQI	Date
435722	118.333333	2015-11-05
435723	118.666667	2015-11-07
435724	140.666667	2015-11-10
435725	133.666667	2015-11-11
435726	105.000000	2015-11-16
435727	112.666667	2015-11-20
435728	121.333333	2015-11-26
435729	120.000000	2015-11-29
435730	120.666667	2015-12-03
435731	125.000000	2015-12-06
435732	121.666667	2015-12-09
435733	127.000000	2015-12-12

435734	122.666667	2015-12-15
435735	117.000000	2015-12-18

## Visualizing the processed Data of AQI



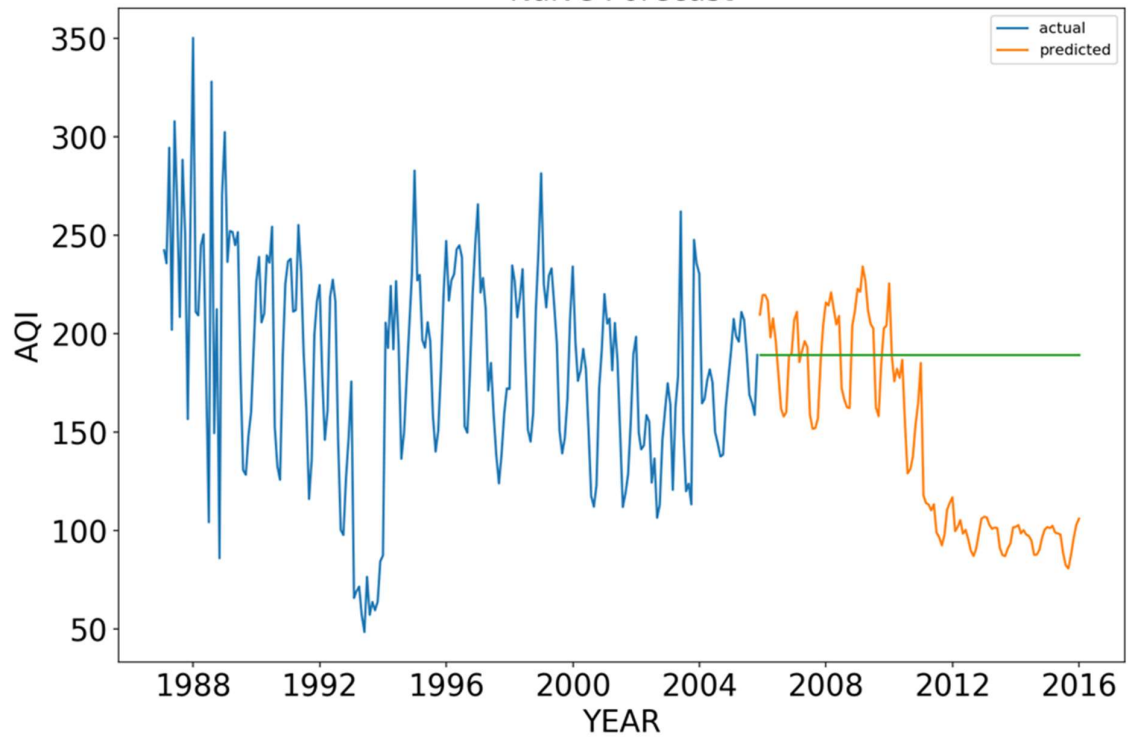
## Plotting the yearly variations of AQI



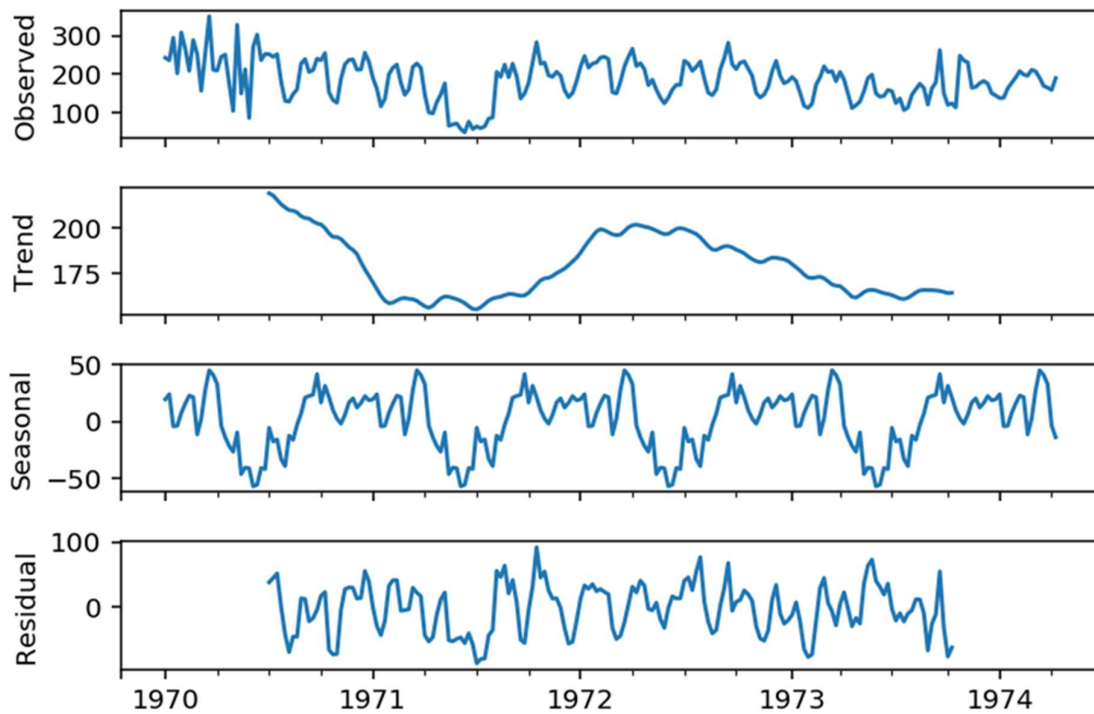
**Naive Forecast Approach to find the variations (trend)**



Naive Forecast



**various statmodel to identity huge variations od data values**



resampling the data to predict monthly AQI of india

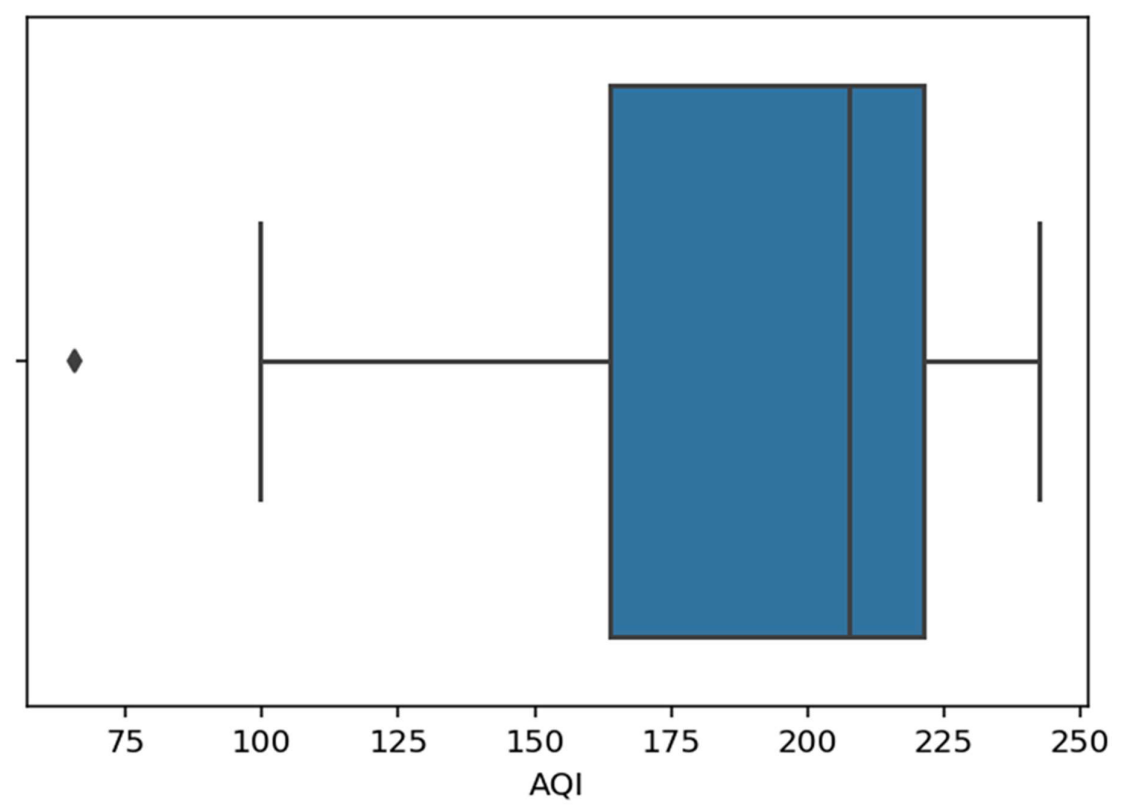
AQI 346

date 346

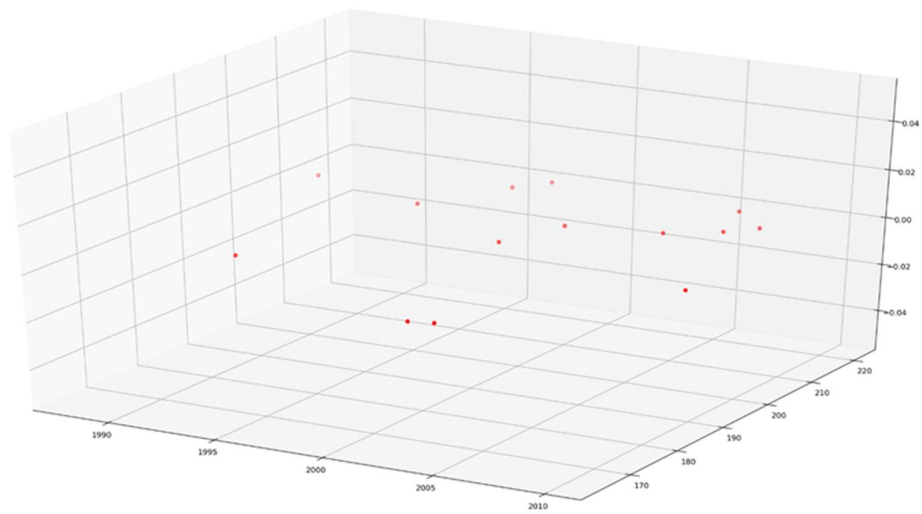
**splitting the sampling date into month and year accordingly**

S.no	AQI	Date	Month	Year
0	242.438652	1987-01-31	1	1987
1	235.787929	1987-02-28	2	1987
2	294.558772	1987-03-31	3	1987
3	202.012681	1987-04-30	4	1987
4	307.991667	1987-05-31	5	1987

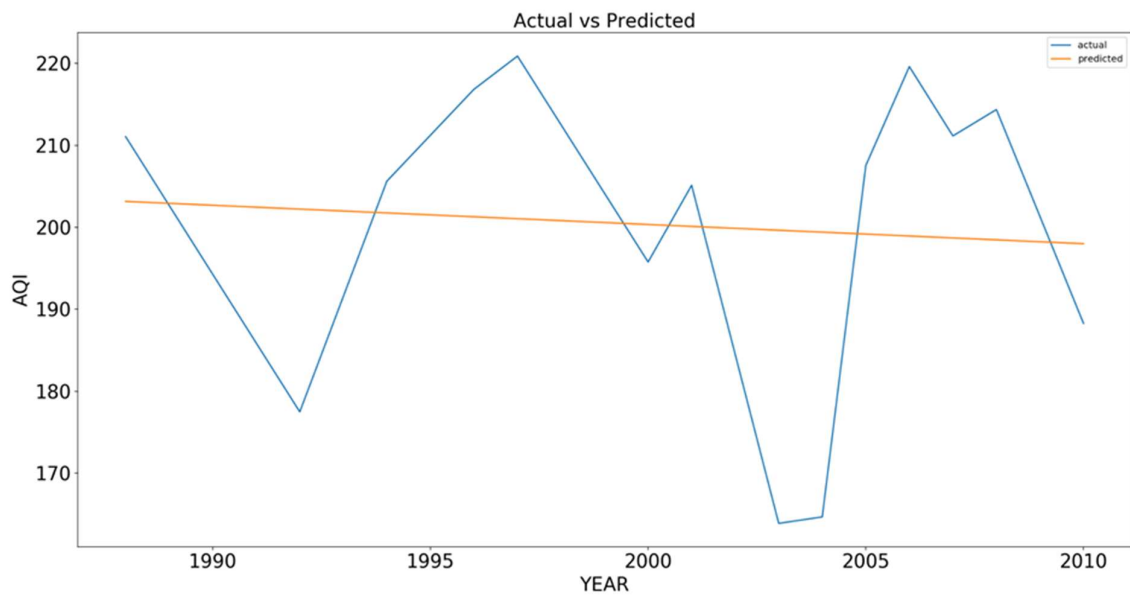
Applying box plot



visualizing the filtered data

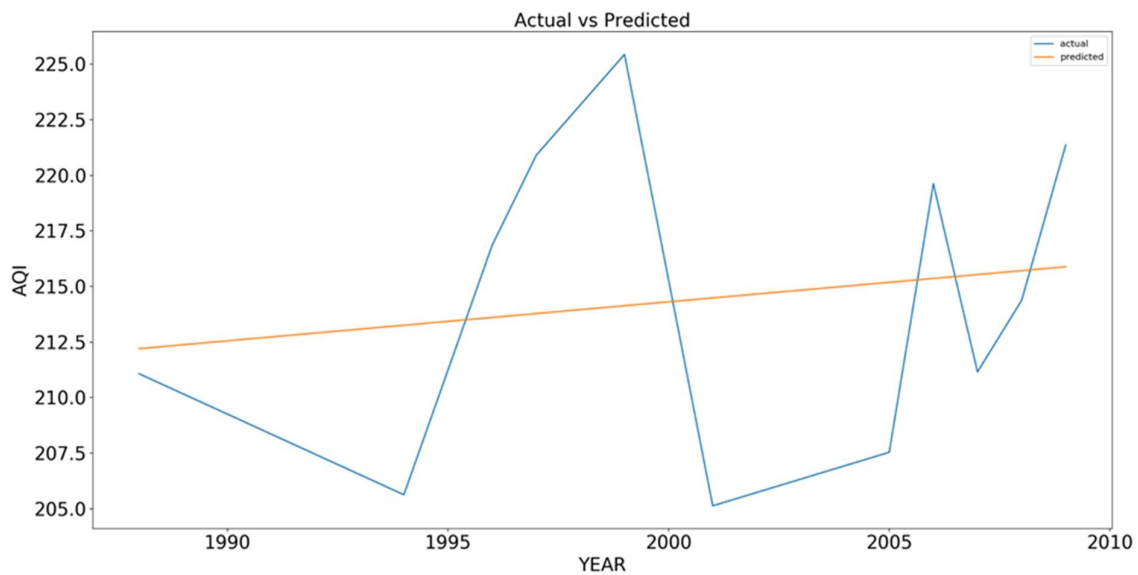


## Predicted val



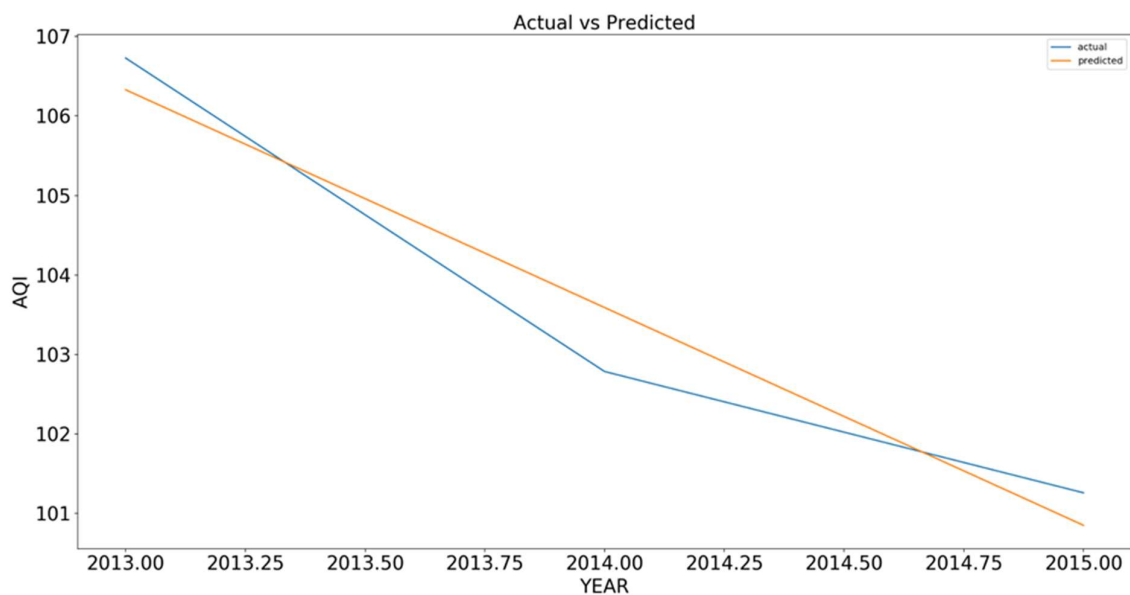
**predicting January (1988-2009) AQI across India**

S.no	Year	AQI	Actual	Predicted
22	2009	221.368166	221.368166	215.888645
21	2008	214.378174	214.378174	215.713307
20	2007	211.160807	211.160807	215.537969
19	2006	219.623267	219.623267	215.362631
18	2005	207.546049	207.546049	215.187293



**prediction of January (2013-2015) across India**

s.no	Year	AQI	Actual	Predicted
28	2015	101.258882	101.258882	100.85
27	2014	102.785280	102.785280	103.59
26	2013	106.729246	106.729246	106.33



## Conclusion :

The Historical Air Quality Data Loaded and preprocessed to found the insight of the data set finally to made a time forecasting model on the India air quality dataset to conclude the air quality index with respect to time period to actual value and predicted value accurately determined.