21DS636- Statistical Modeling

Assignment-3- Time Series Analysis

NOTE: For implementation questions add dummy series of dates using date_range() in pandas.

1. For the following data series, find the first four lags of autocovariance (γ_0 , γ_1, γ_2, γ_3) and auto correlation function (p_0 , p_1 , p_2, p_3) manually.

1	2	3	4	5	6	7	8	9	10
2.34	1.47	1.13	0.62	1.51	0.78	-0.02	1.04	0.80	1.42

2. For the following data series of 30 observations, plot ACF and PACF and Identify the suitable model and Coefficients (Hint: can use auto_arima method)?

487	577	651	1107	1427
511	598	689	1293	1450
537	548	696	1532	1476
548	599	661	1396	1502
538	651	751	1283	1534
561	632	883	1403	1543

3. For the following data , Add some dummy dates, do some analysis like Visualization and ADF-test and also list out your observation from data. (submit screenshots as well)

2.34	-0.02	-0.96	2.70	0.79
1.47	1.04	0.29	2.63	1.89
1.13	0.80	2.56	2.44	4.36
0.62	1.42	3.33	1.38	2.23
1.51	1.15	3.74	1.11	2.19
0.78	1.57	2.88	1.10	0.59

4. For the given set of data, 3.65, 8.03, 5.72, 4.93, 5.71, 4.79, 4.87, 6.48, 6.40, 6.41 find the order of auto_arima model and check whether it is like ACF and PACF plots observations. If, not same then compare the two models and specify which is the better model and how we decide.