Demo Airline Data ARIMA - Solution

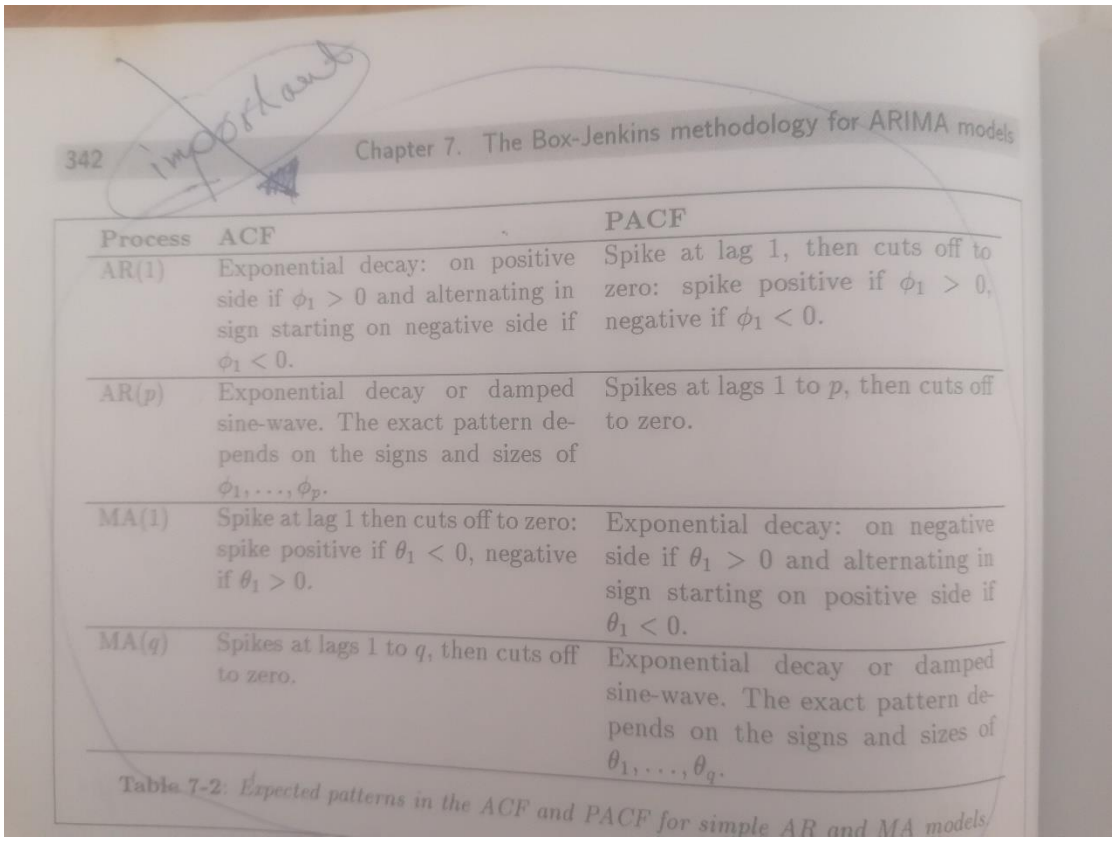
There is evidence of existence of seasonal unit root so seasonal difference -- > D=1

There is evidence of existence of unit roots so d=1. SO we need to seasonal difference and first difference.

If in first (needed in this case) and seasonally differenced data (needed in this case) there is a peak in the seasonal lag in the PACF then the P=1. If there is a second peak in the 2*seasonal lag then P=2.

If in first (needed in this case) and seasonally differenced data (needed in this case) there is a peak in the seasonal lag in the ACF then the Q=1. If there is a second peak in the 2*seasonal lag then Q=2.

Nothing of the above two is valid so P=0, Q=0 and also D=1 and d=1.



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Process	ACF	PACF
AR(1)	Exponential decay: on positive side if $\phi_1 > 0$ and alternating in sign starting on negative side if $\phi_1 < 0$.	Spike at lag 1, then cuts off to zero: spike positive if $\phi_1 > 0$, negative if $\phi_1 < 0$.
AR(p)	Exponential decay or damped sine-wave. The exact pattern depends on the signs and sizes of $\phi_1, \ldots, \phi_p$.	Spikes at lags 1 to p, then cuts off to zero.
MA(1)	Spike at lag 1 then cuts off to zero: spike positive if $\theta_1 < 0$, negative if $\theta_1 > 0$.	Exponential decay: on negative side if $\theta_1 > 0$ and alternating in sign starting on positive side if $\theta_1 < 0$.
MA(q)	Spikes at lags 1 to q, then cuts off to zero.	Exponential decay or damped sine-wave. The exact pattern depends on the signs and sizes of $\theta_1, \ldots, \theta_q$.

Table 7-2: Expected patterns in the ACF and PACF for simple AR and MA models

AR(2) cause PACF spike at 1, 2 and MA(1) cause ACF spike at lag 1 So our model is ARIMA (2,1,1) (0,1,0)