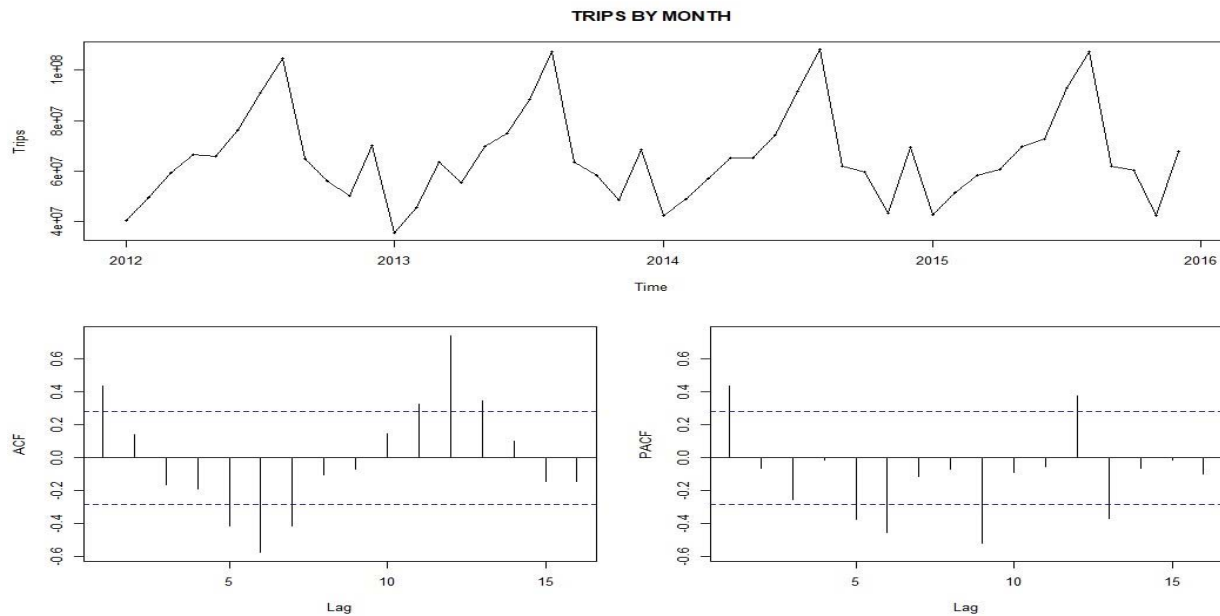


FORECASTING ASSIGNMENT  
Exercise 2 (Tourist Trips Data)

Ravi Shankar

Data = Tourist trip data contains the number of personal domestic trips by month of departure for the European Union (28 countries). Trip for one night or over.

### VISUALISATION



- Seasonal data
- Non-stationary data

### MODEL ESTIMATION

#### ETS Model

Model tried are ("AAA", "AAM", "AMA", "AMM", "AAA", "AAM", "AMA", "AMM"). with and without damping. All relevant models performance are compared together with other models in the end.

	AICc	MASE_train	MASE_test	RMSE_train	RMSE_test	Damping
AAA	1257.681	0.5487212	0.7909307	2499477	3414669	0
AAM	1255.242	0.5178507	0.6968166	2416203	2926220	0
AMA	1257.497	0.5477295	0.7950889	2493087	3484329	0
AMM	1255.957	0.5509747	0.7290236	2440333	3087198	0
AAA	1265.449	0.5459671	0.7992570	2483304	3422145	1
AAM	1262.535	0.5049619	0.7363699	2384784	2967937	1
AMA	1265.426	0.5454732	0.7993224	2482505	3433198	1
AMM	1262.172	0.5102791	0.7201045	2372800	3002103	1

#### ARIMA model

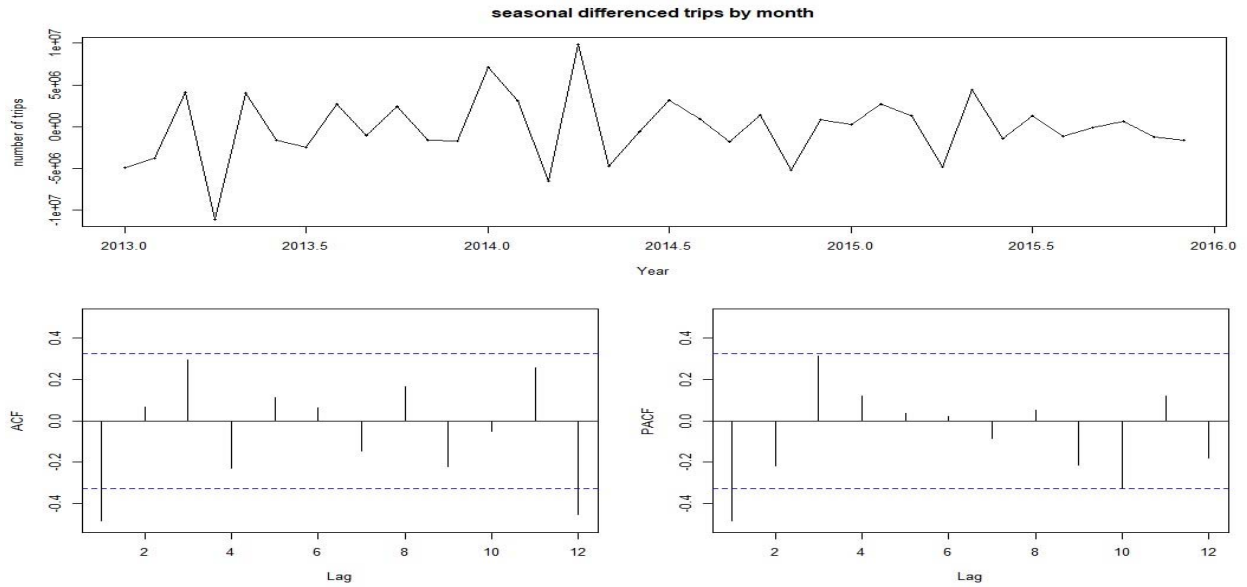
Stabilizing data: Seasonal diff = 1 & Non-Seasonal diff = 0.

Based on ACF and PACF, a first model could be ARIMA (1,0,2) (0,1,2) /12. Also testing other combination for p and q at D = 1 .

# FORECASTING ASSIGNMENT

## Exercise 2 (Tourist Trips Data)

Ravi Shankar



	AICC	MASE_train	MASE_test	RMSE_train	RMSE_test
[1,]	802.7146	0.3037810	0.8804615	1604801	3782017
[2,]	798.7327	0.3755819	0.6713100	2041128	2686365
[3,]	806.6191	0.3165144	0.8690297	1680651	3860322
[4,]	803.4338	0.2607667	0.9297147	1438862	3914141
[5,]	804.6281	0.3039614	0.7370419	1629713	3281069
[6,]	800.3168	0.3478516	0.7163762	1964210	2931845
[7,]	804.6281	0.3039614	0.7370419	1629713	3281069
[8,]	800.3168	0.3478516	0.7163762	1964210	2931845

### MODEL SELECTION

SR	MODEL	Aicc	MASE TRAIN	MASE TEST	RMSE TRAIN	RMSE TEST	Damping	D
1	AAM	1255.242	0.518	0.697	2416203.000	2926220.000	0	
2	AMM	1262.172	0.510	0.720	2372800.000	3002103.000	1	
3	order=c(1,0,1) seasonal=c(0,1,1)	798.733	0.376	0.671	2041128.000	2686365.000		1
4	order=c(1,0,1) seasonal=c(0,1,3)	803.434	0.261	0.930	1438862.000	3914141.000		1

Best model of all considered model is **ARIMA (1,0,1) (0,1,1) /12**. Also Succeeded in LjungBox Test.

**Final Forecast with best model**

