FARGO HEALTH CASE

Presented by:

Sheethal Sridhar

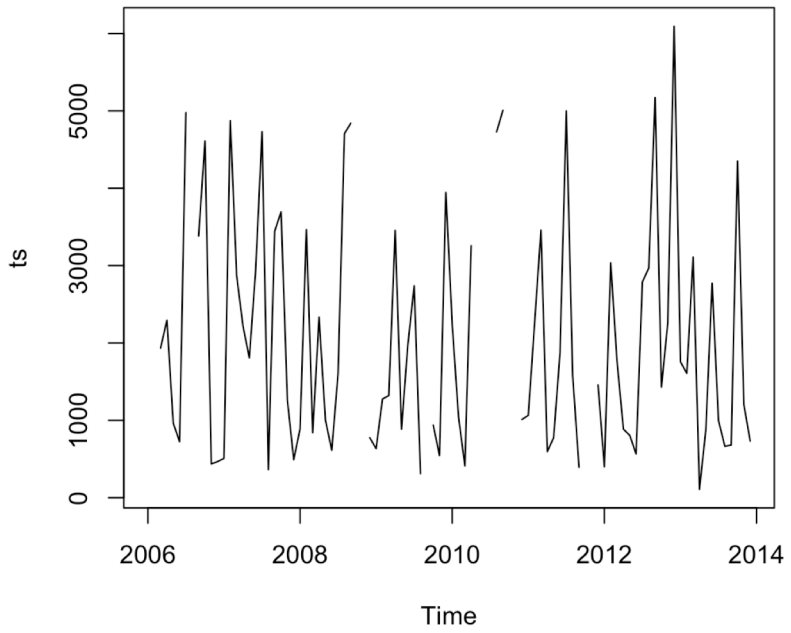
DATA PREPARATION

Objective

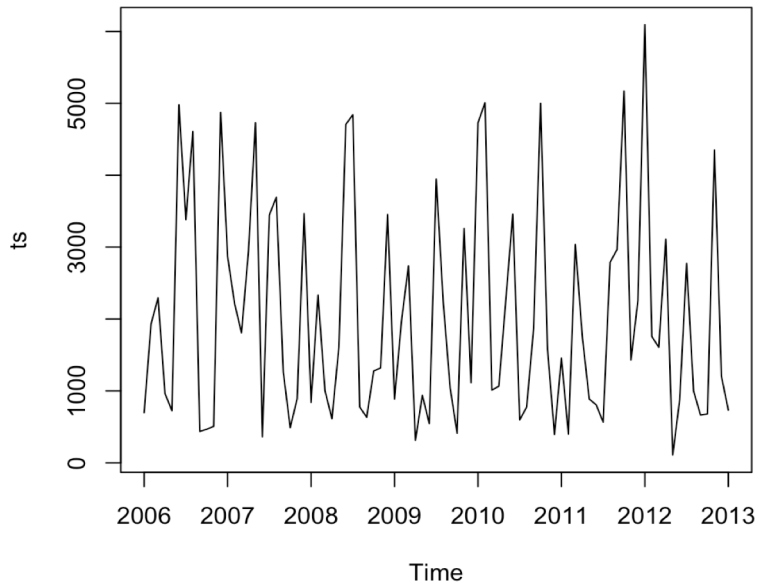
To predict the number of Cardio vascular examination volume at the Abbeville HC

- Converted the Incoming Examinations to numeric type
- Replaced the Outliers and missing values with NAs

```
> summary(ts)
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's
    107     776    1578    2036    3037    6094      11
```



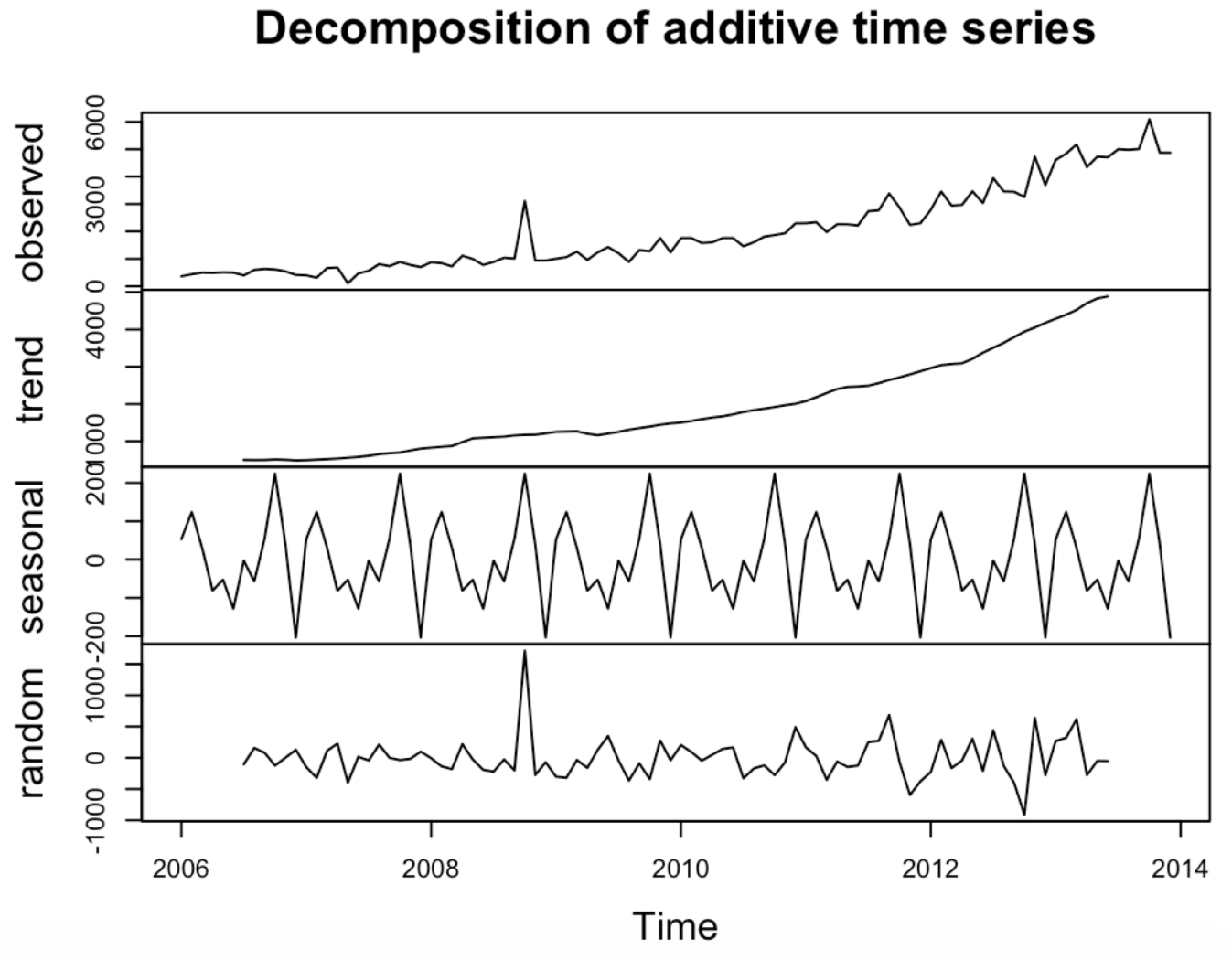
Initial Data with NAs



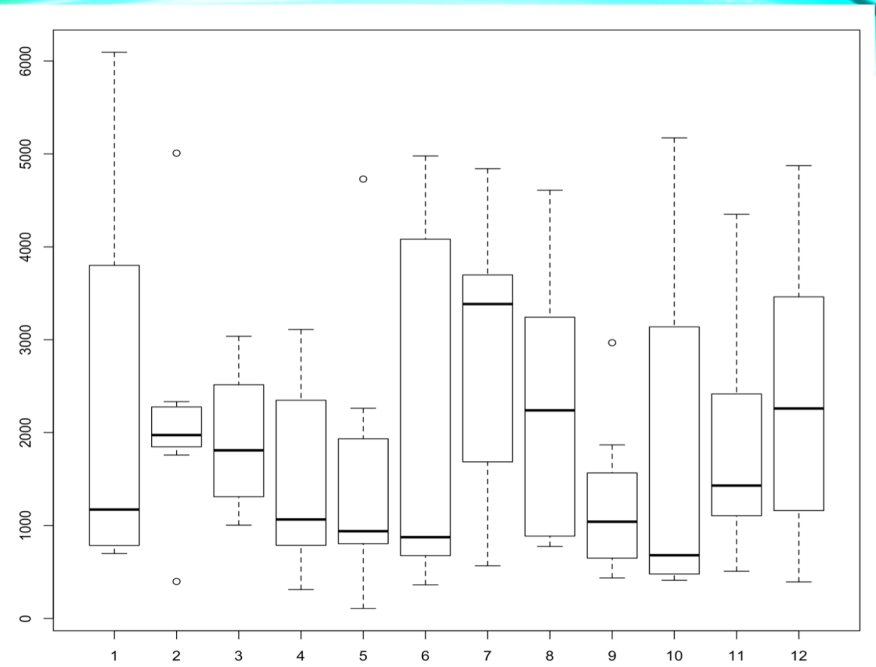
Data after removing NAs

EXPLORATORY ANALYSIS

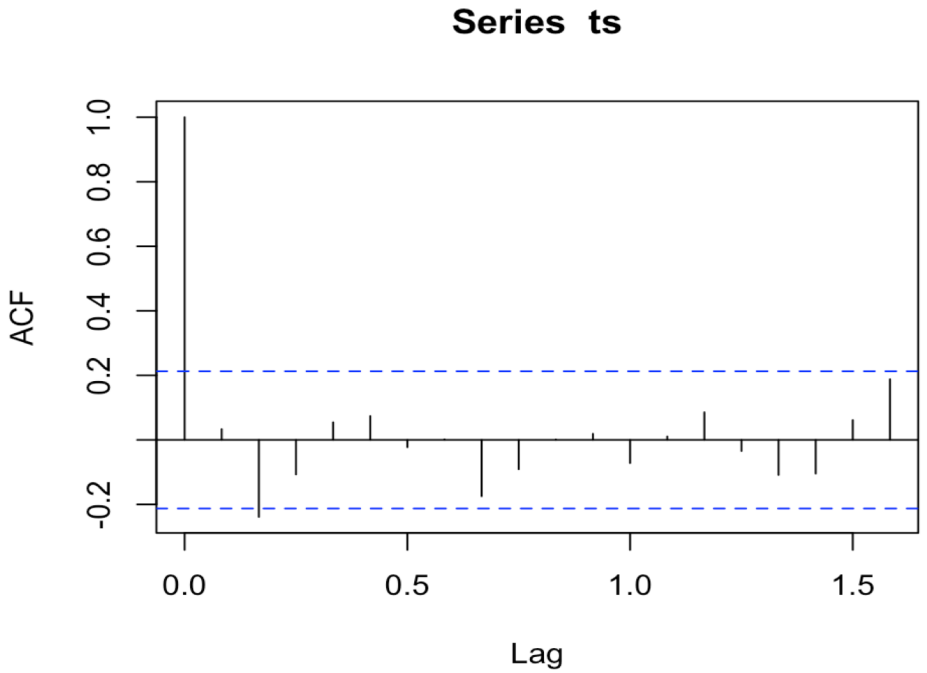
Checking for Trend, Seasonality, Cyclicity, and Irregularity in the data.

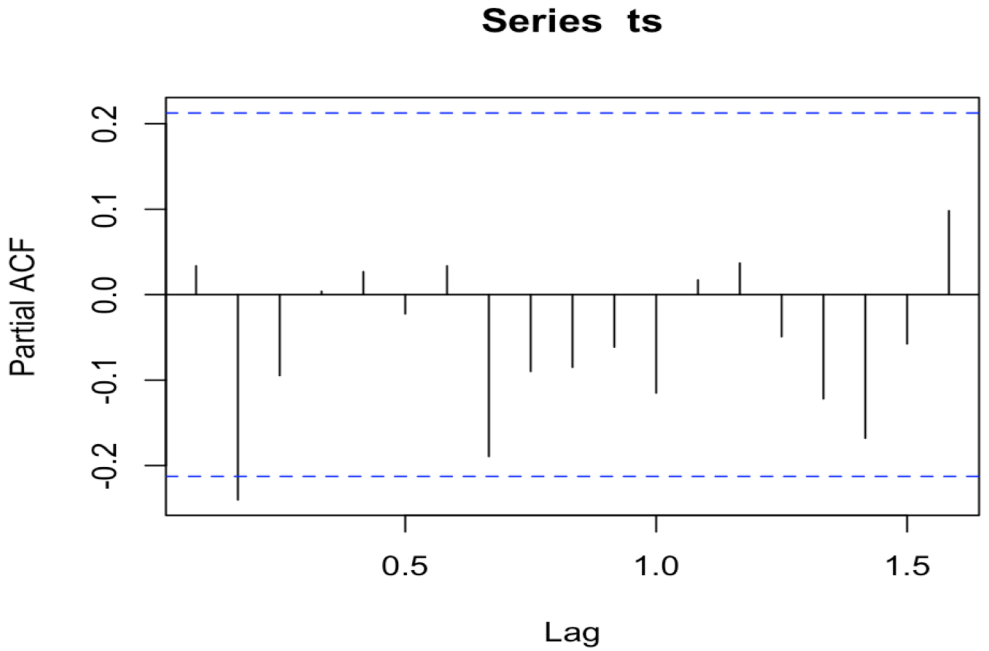


EXPLORATORY ANALYSIS



Testing Auto-correlation:
ACF: Auto-correlation function
PACF: Partial Auto-correlation function





ARIMA MODEL

```
> auto.arima(ts,ic="bic",trace=TRUE)

 ARIMA(2,1,2)(1,0,1)[12] with drift         : Inf
 ARIMA(0,1,0)            with drift         : 1458.6
 ARIMA(1,1,0)(1,0,0)[12] with drift         : 1442.556
 ARIMA(0,1,1)(0,0,1)[12] with drift         : 1427.237
 ARIMA(0,1,0)                               : 1454.907
 ARIMA(0,1,1)            with drift         : 1422.812
 ARIMA(0,1,1)(1,0,0)[12] with drift         : 1427.23
 ARIMA(0,1,1)(1,0,1)[12] with drift         : 1431.774
 ARIMA(1,1,1)            with drift         : 1427.274
 ARIMA(0,1,2)            with drift         : 1427.265
 ARIMA(1,1,0)            with drift         : 1438.129
 ARIMA(1,1,2)            with drift         : 1431.664
 ARIMA(0,1,1)                               : 1428.73

 Best model: ARIMA(0,1,1)            with drift

Series: ts
ARIMA(0,1,1) with drift

Coefficients:
          ma1    drift
      -0.7078  50.9924
s.e.   0.0623  12.3458

sigma^2 estimated as 164267:  log likelihood=-704.58
AIC=1415.15   AICc=1415.41   BIC=1422.81
```

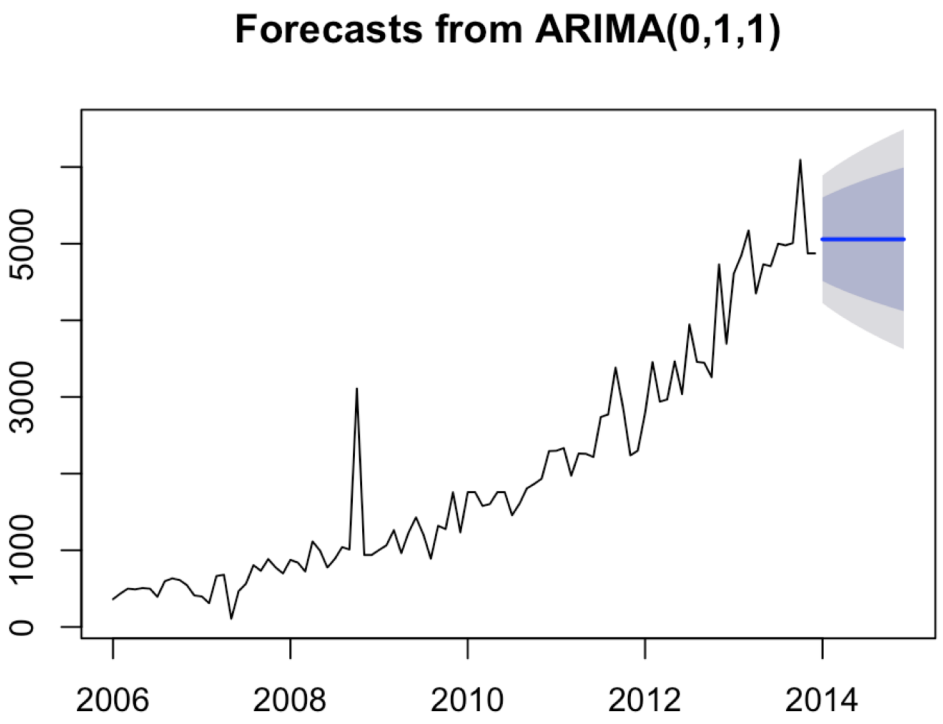
```
> ts

Call:
arima(x = tsna.fargo, order = c(0, 1, 1))

Coefficients:
          ma1
      -0.5765
s.e.   0.0703

sigma^2 estimated as 180099:  log likelihood = -709.81,  aic = 1423.62
```

The best model gives the p, d, q values - 0,1,1



	Point Forecast	Lo 80	Hi 80	Lo 95	Hi 95
Feb 2013	4997.885	4301.894	5693.876	3933.459	6062.311
Mar 2013	4997.885	4240.924	5754.846	3840.213	6155.557
Apr 2013	4997.885	4184.511	5811.259	3753.937	6241.833
May 2013	4997.885	4131.765	5864.005	3673.269	6322.501
Jun 2013	4997.885	4082.051	5913.718	3597.239	6398.531
Jul 2013	4997.885	4034.901	5960.869	3525.128	6470.641
Aug 2013	4997.885	3989.954	6005.816	3456.388	6539.382
Sep 2013	4997.885	3946.927	6048.842	3390.584	6605.186
Oct 2013	4997.885	3905.594	6090.175	3327.371	6668.399
Nov 2013	4997.885	3865.769	6130.000	3266.464	6729.306
Dec 2013	4997.885	3827.298	6168.471	3207.627	6788.142
Jan 2014	4997.885	3790.052	6205.717	3150.664	6845.105