Forecast Total Watt Using ARIMA

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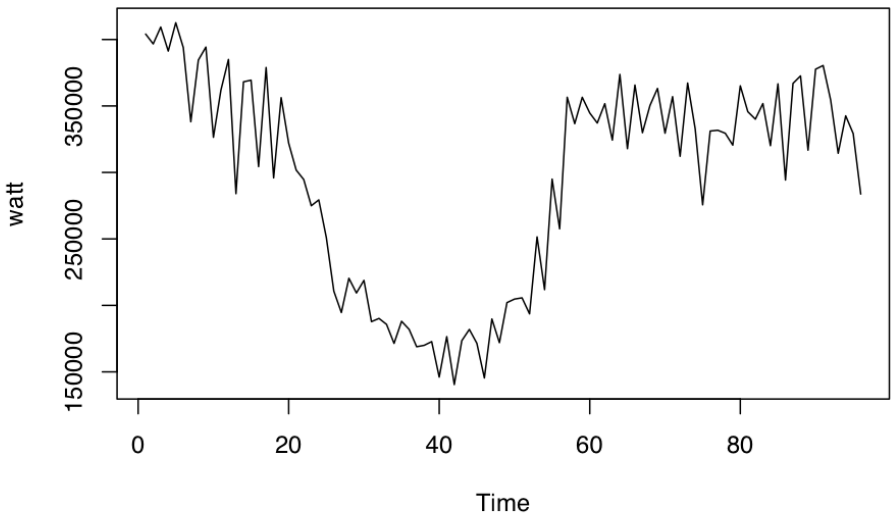
Take the data on 2016-08-24 as an example:

```
train <- read.csv("aug.csv", sep=',')

watt=ts(train$allsum)
plot.ts(watt)

library(tseries)
```

```
## Warning: package 'tseries' was built under R version 3.3.2
```




```
kpss.test(watt)
```

```
##
##  KPSS Test for Level Stationarity
##
## data:  watt
## KPSS Level = 0.67622, Truncation lag parameter = 2, p-value =
## 0.01571
```

```
library(forecast)
```

```
## Loading required package: zoo
```

```
##
## Attaching package: 'zoo'

## The following objects are masked from 'package:base':
##
##     as.Date, as.Date.numeric

## Loading required package: timeDate

## This is forecast 7.3
```

```
auto.arima(watt)
```

```
## Series: watt
## ARIMA(0,1,2)
##
## Coefficients:
##           ma1     ma2
##       -0.8128  0.5231
## s.e.   0.0848  0.0880
##
## sigma^2 estimated as 828245425:  log likelihood=-1109.68
## AIC=2225.36   AICc=2225.62   BIC=2233.02
```

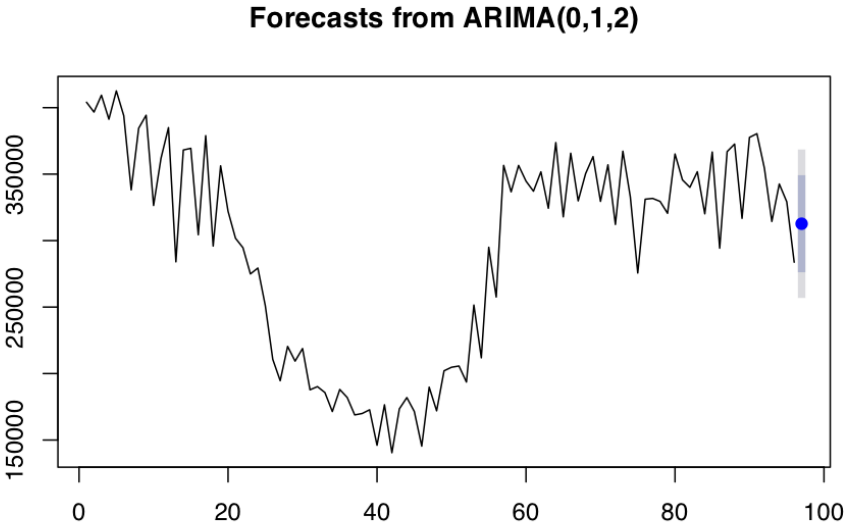
```
model<-arima(watt, order=c(0,1,2))
model
```

```
##
## Call:
## arima(x = watt, order = c(0, 1, 2))
##
## Coefficients:
##           ma1     ma2
##       -0.8128  0.5231
## s.e.   0.0848  0.0880
##
## sigma^2 estimated as 810806960:  log likelihood = -1109.68,  aic = 2225.36
```

```
forecast_watt<-forecast(model,h=1)
forecast_watt
```

```
##    Point Forecast    Lo 80  Hi 80    Lo 95    Hi 95
## 97       312706.2 276214.5 349198 256896.9 368515.6
```

```
plot(forecast_watt)
```



So based on the historical data we can use ARIMA model to forecast the total watts of next 15 mins, which is on 2016-08-27 00:00:00-00:15:00, is 312706.2. With 80% confidence interval [276214.5, 349198.0] or with 95% confidence interval [256896.9, 368515.6].