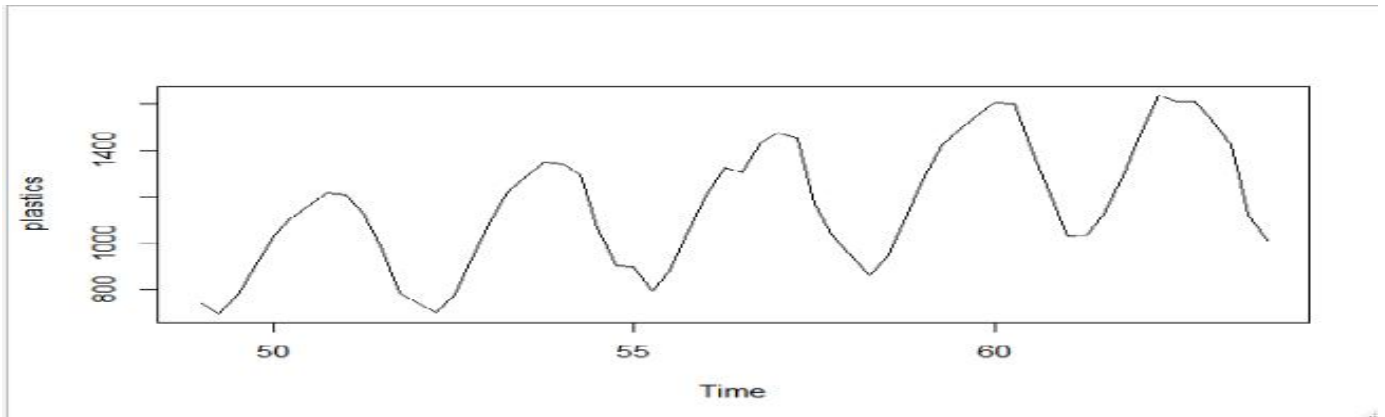


Forecasting – Plastic Sales

Visualization show that Sales having level, trend and seasonality i.e. Additive Seasonality



Using HoltWinters Function →

Optimum Values with $\alpha = 0.2$ which is default value assuming time series data has only level parameter

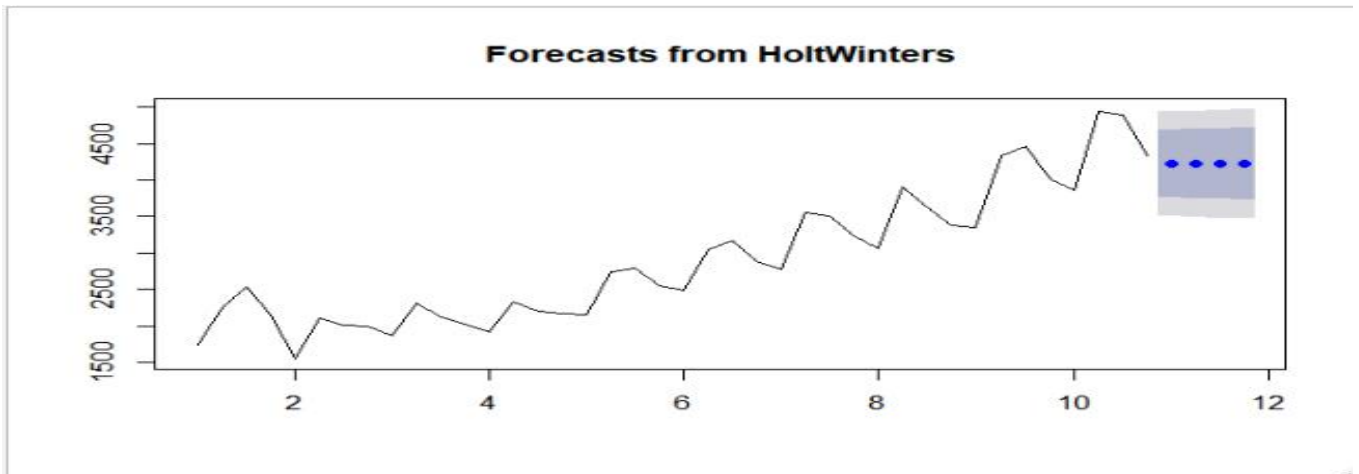
Alpha = level smoothing, Beta = Trend smoothing, Gama = Seasonality Smoothing

Smoothing parameters:

alpha: 0.2
beta : FALSE
gamma: FALSE

Coefficients:

[,1]
a 4222.86



```
> hwa_mape  
[1] 16.12634
```

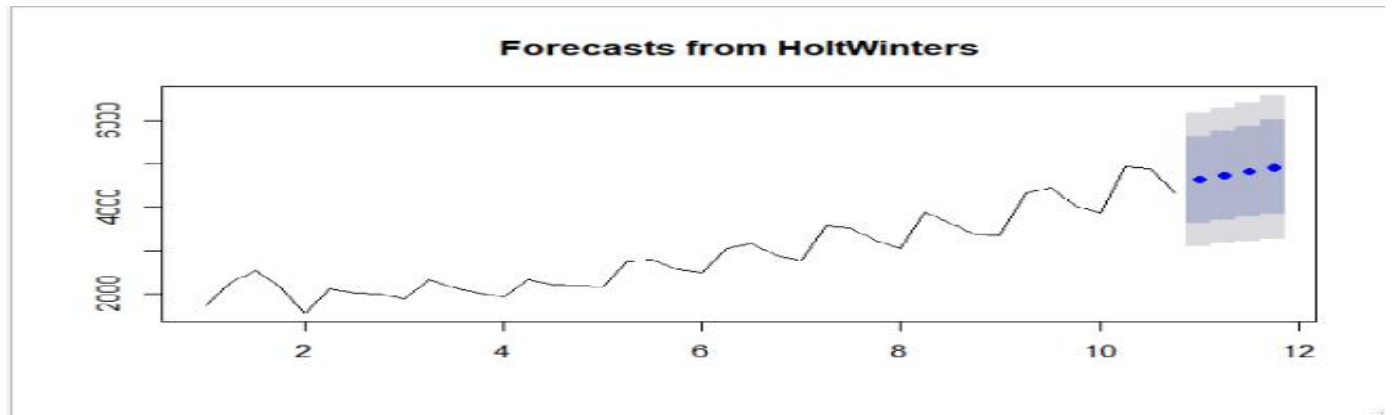
Optimum values with $\alpha=0.2$, $\beta=0.1$ assuming time series data has level and trend parameter

Smoothing parameters:

alpha: 0.2
beta : 0.1
gamma: FALSE

Coefficients:

[,1]
a 4541.49927
b 94.23843



```
> hwab_mape  
[1] 8.928085
```

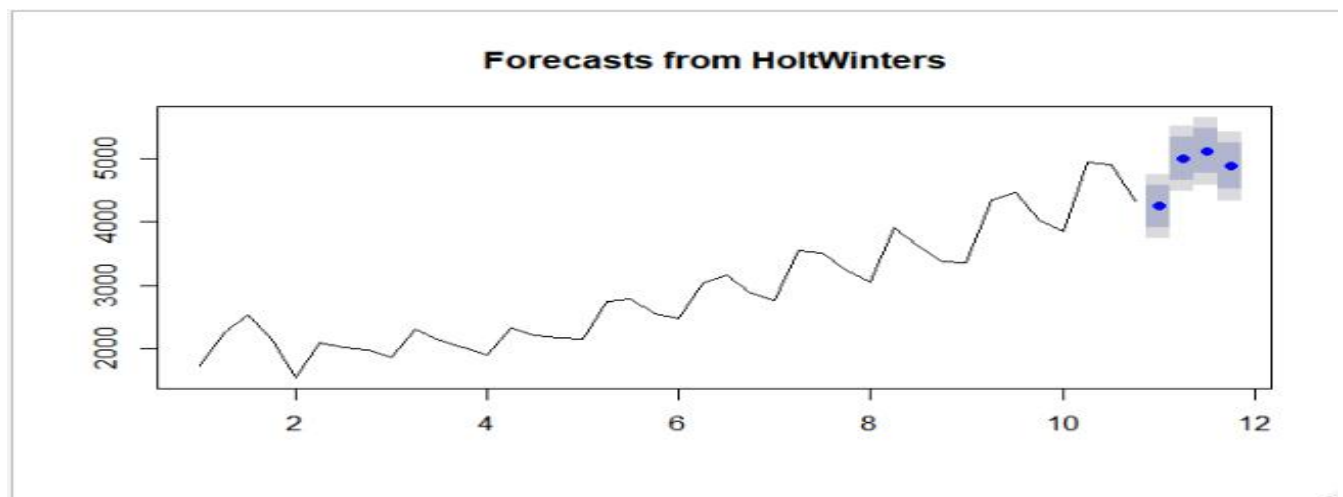
Optimum values with $\alpha=0.2$, $\beta=0.1$, $\gamma=0.1$ assuming time series data has level, trend and seasonality

Smoothing parameters:

alpha: 0.2
beta : 0.1
gamma: 0.1

Coefficients:

[,1]
a 4388.85411
b 98.81771
s1 -241.41753
s2 403.81657
s3 427.05132
s4 89.34998



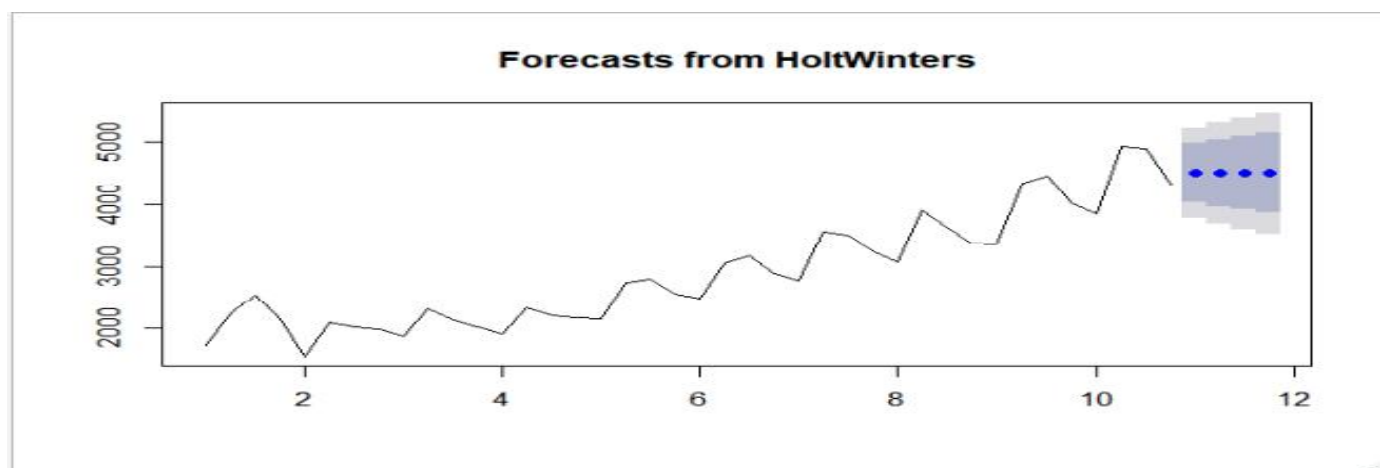
```
> hwabg_mape
[1] 8.928085
```

By looking at the plot the characters of forecasted values are closely following historical data.

Without optimum values →

Smoothing parameters:
 alpha: 0.5121267
 beta : FALSE
 gamma: FALSE

Coefficients:
 [,1]
 a 4505.092



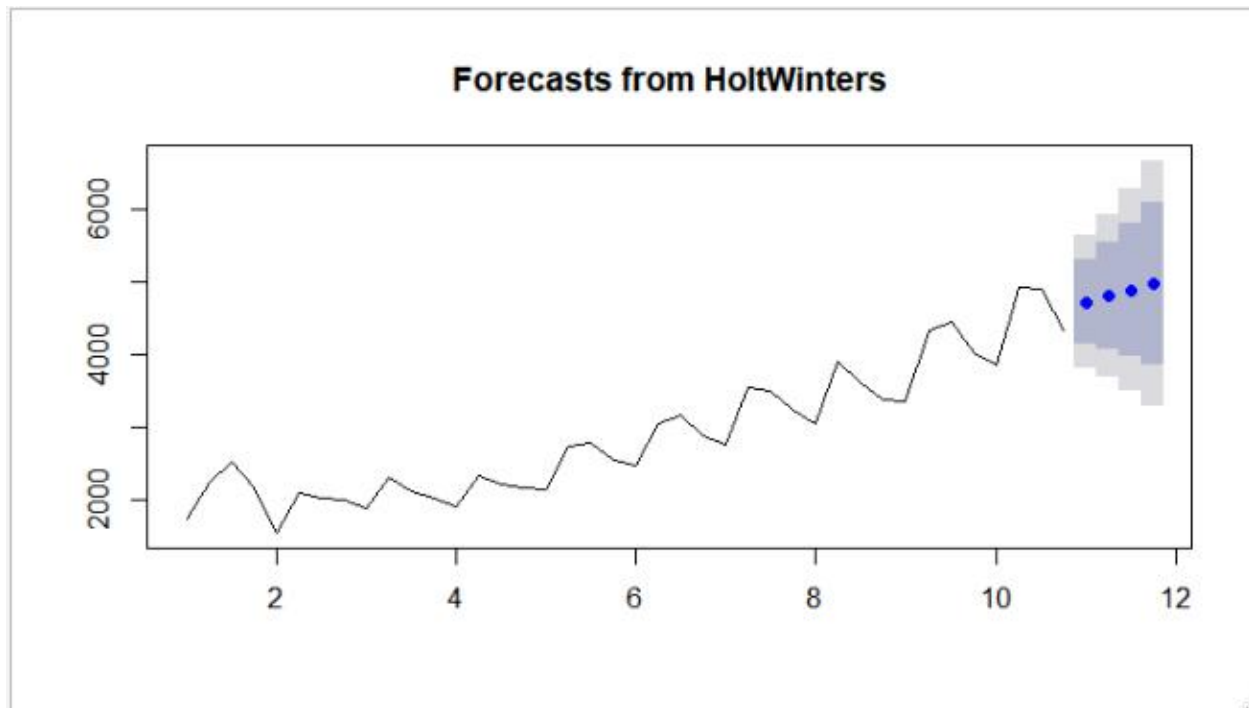
```
> hwna_mape
[1] 9.093032
```

Smoothing parameters:

alpha: 0.557324
beta : 0.3096004
gamma: FALSE

Coefficients:

[,1]
a 4644.30671
b 82.90134



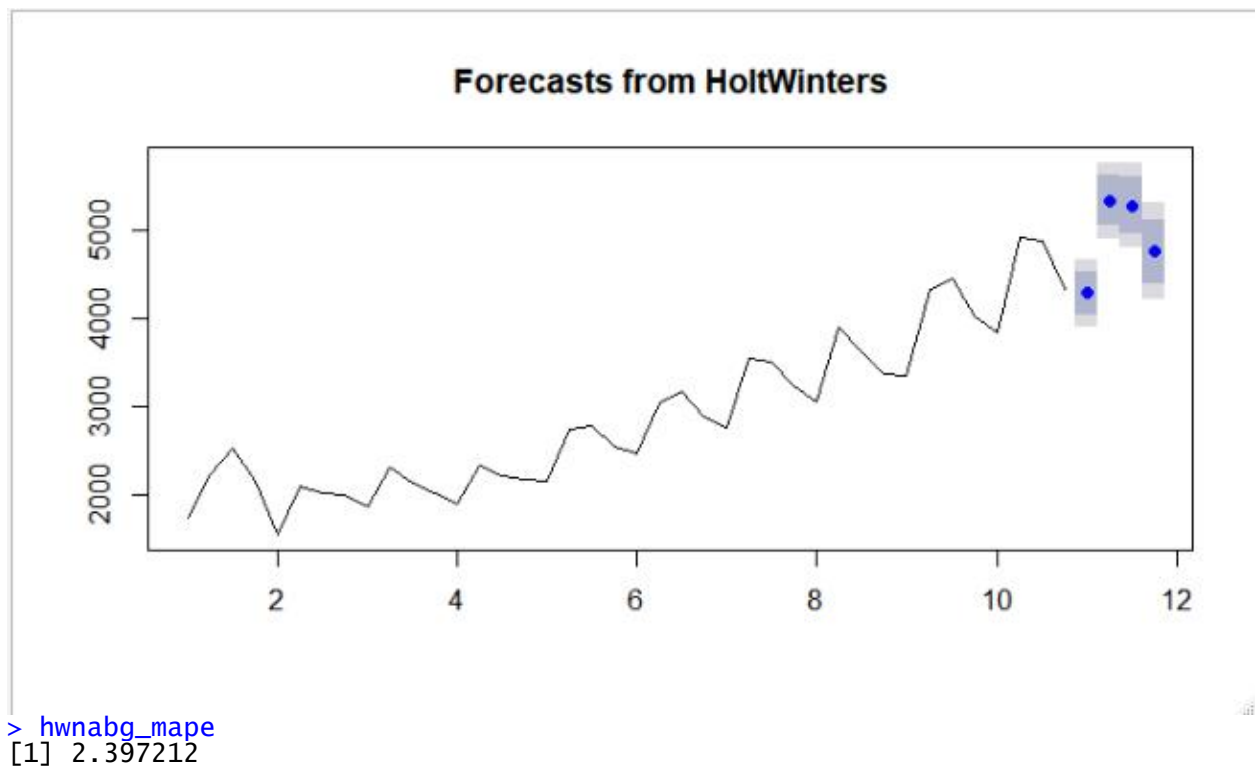
```
> hwnab_mape  
[1] 8.627493
```

Smoothing parameters:

alpha: 0.3932448
beta : 0.2371347
gamma: 0.9592084

Coefficients:

[,1]
a 4376.52160
b 107.43863
s1 -193.78961
s2 755.41436
s3 592.07698
s4 -40.76381



By looking at the plot the characters of without optimum forecasted values are closely following historical data.