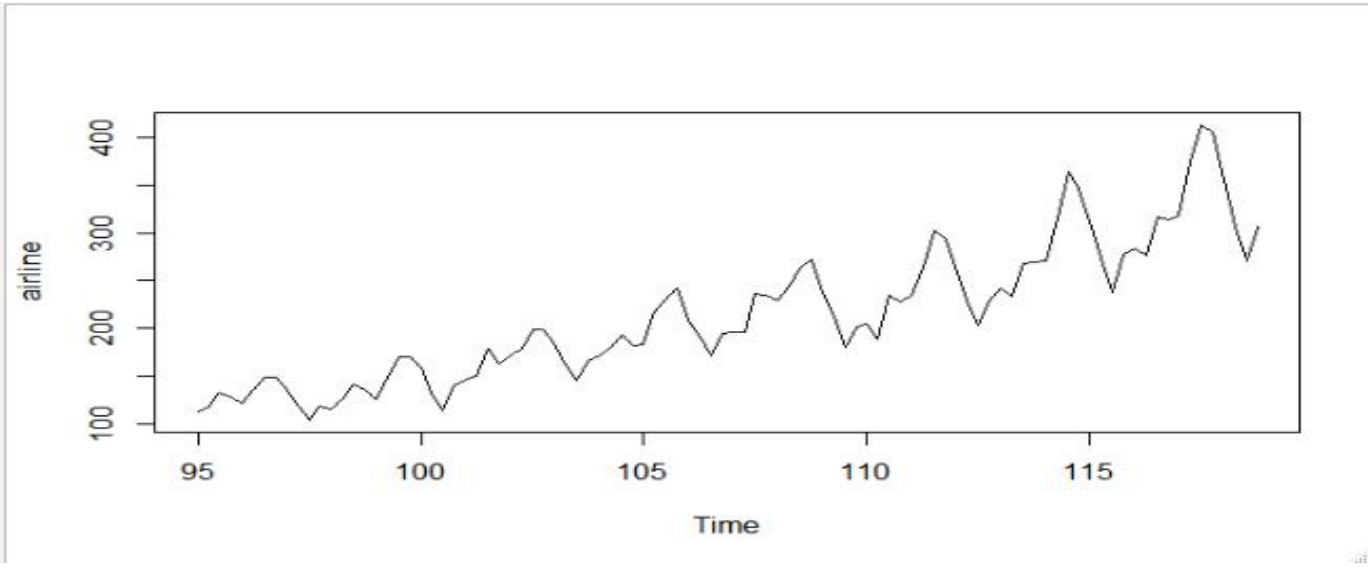
Forecasting- Airline Dataset

Visualization shows that it has level, trend and fluctuate with seasonality change.



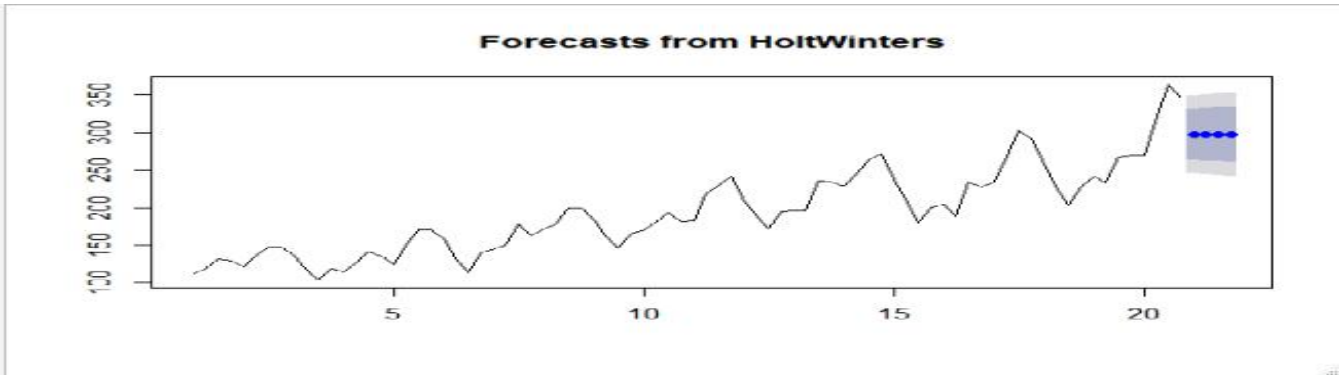
Using HoltWinters Function ➔

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 297.4342
```

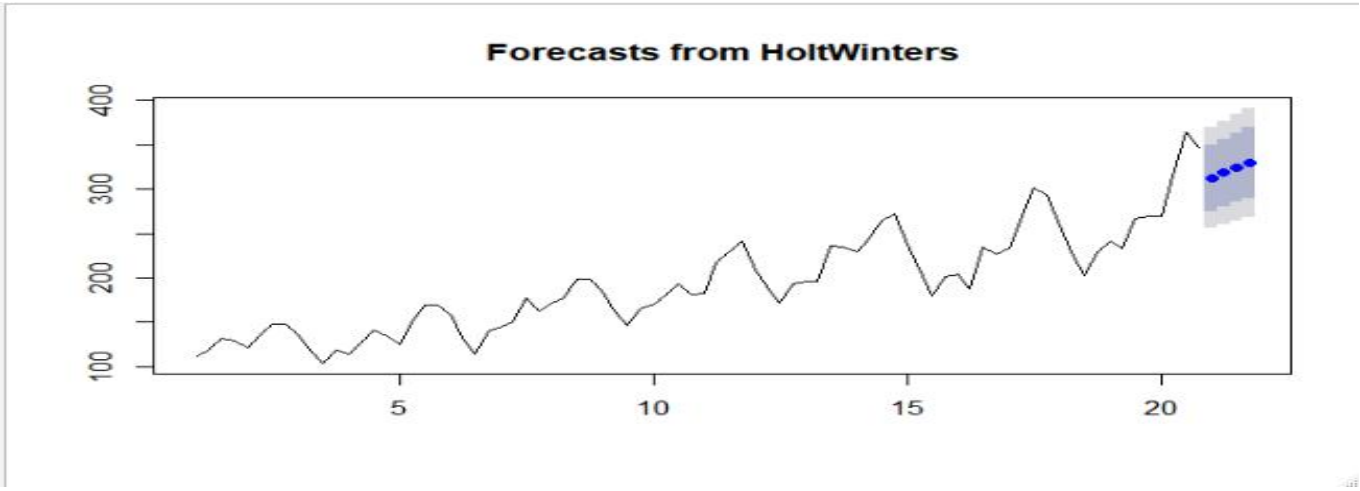


By looking at plot the forecasted values are not showing any characters of train data.

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 306.834206
b   5.673007
```

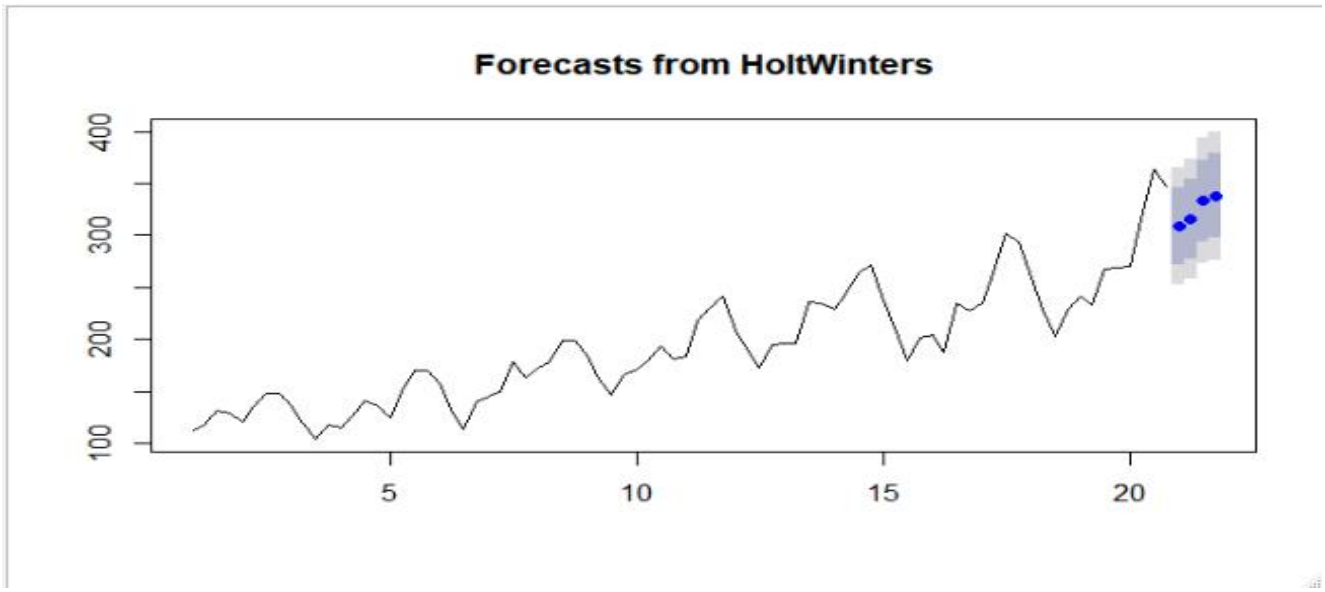


By looking at the plot the forecasted values are still missing some characters exhibited by train data.

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  308.334502
b    5.589123
s1  -5.261337
s2  -3.828212
s3   8.342981
s4   7.353062
```

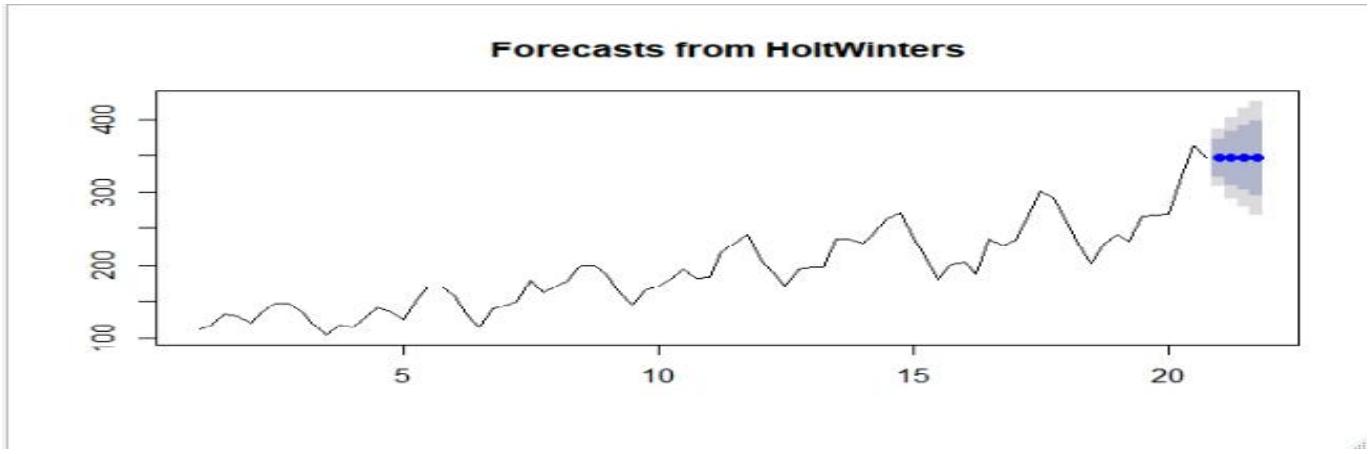


By looking at the plot the characters of forecasted values are closely following historical data.

Without Optimum Values➔

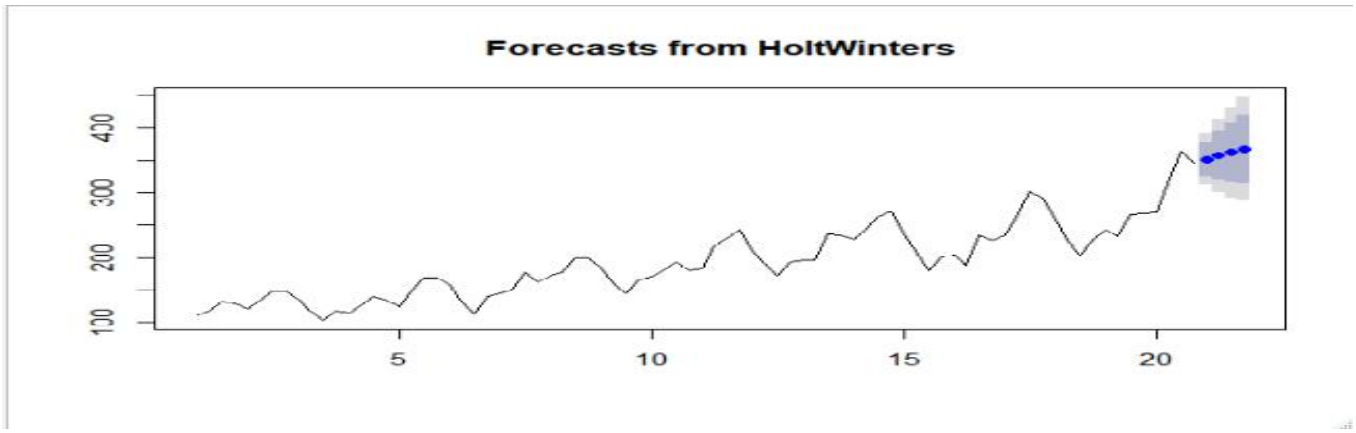
```
Smoothing parameters:
 alpha: 0.9999339
 beta : FALSE
 gamma: FALSE

Coefficients:
      [,1]
a 347.0011
```



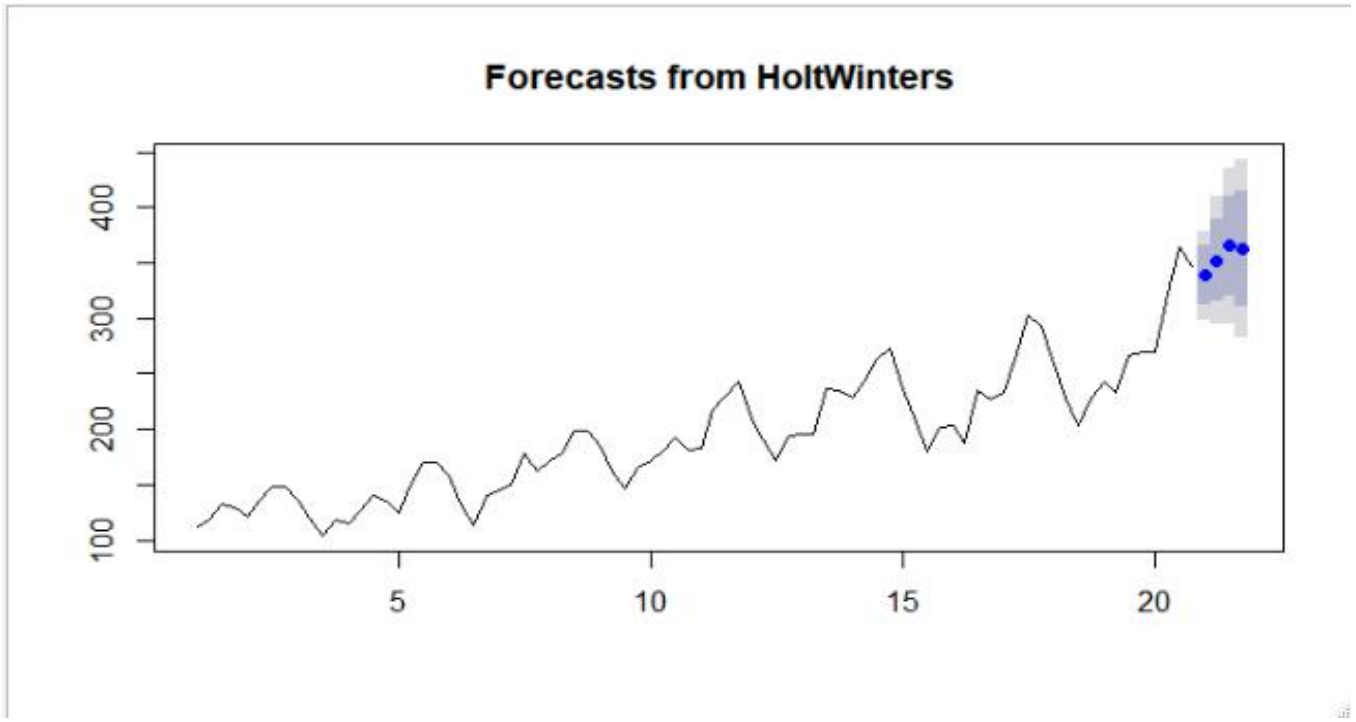

```
Smoothing parameters:
 alpha: 1
 beta : 0.005491927
 gamma: FALSE

Coefficients:
        [,1]
a 347.000000
b   5.008211
```




```
Smoothing parameters:
 alpha: 1
 beta : 0
 gamma: 0

Coefficients:
        [,1]
a  344.90625
b    3.93750
s1 -10.03125
s2  -0.40625
s3   8.34375
s4   2.09375
```



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