

END SEM PRESENTATION

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PROJECT OVERVIEW



DATA COLLECTION

Collection of two datasets of stock price and expense on R and D



LINEAR REGRESSION

Correlation between stock price and expense on R and D

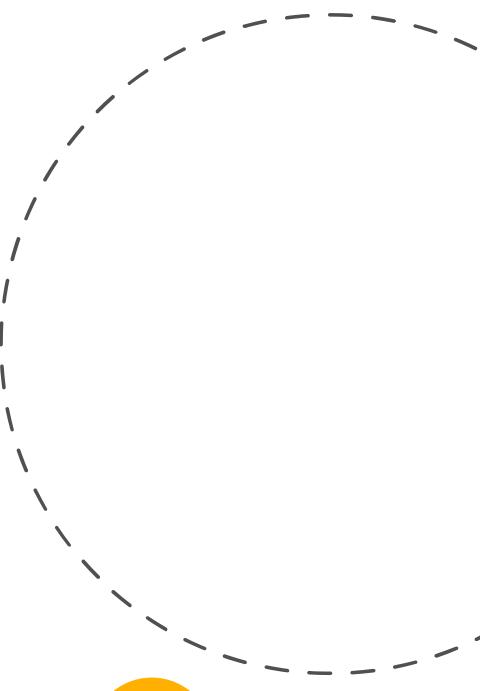


PREDICT EXPENSE ON R AND D

Using time series in R



USING LINEAR REGRESSION AND CORRELATION



PREDICTION OF VARIOUS ATTRIBUTES



DATA

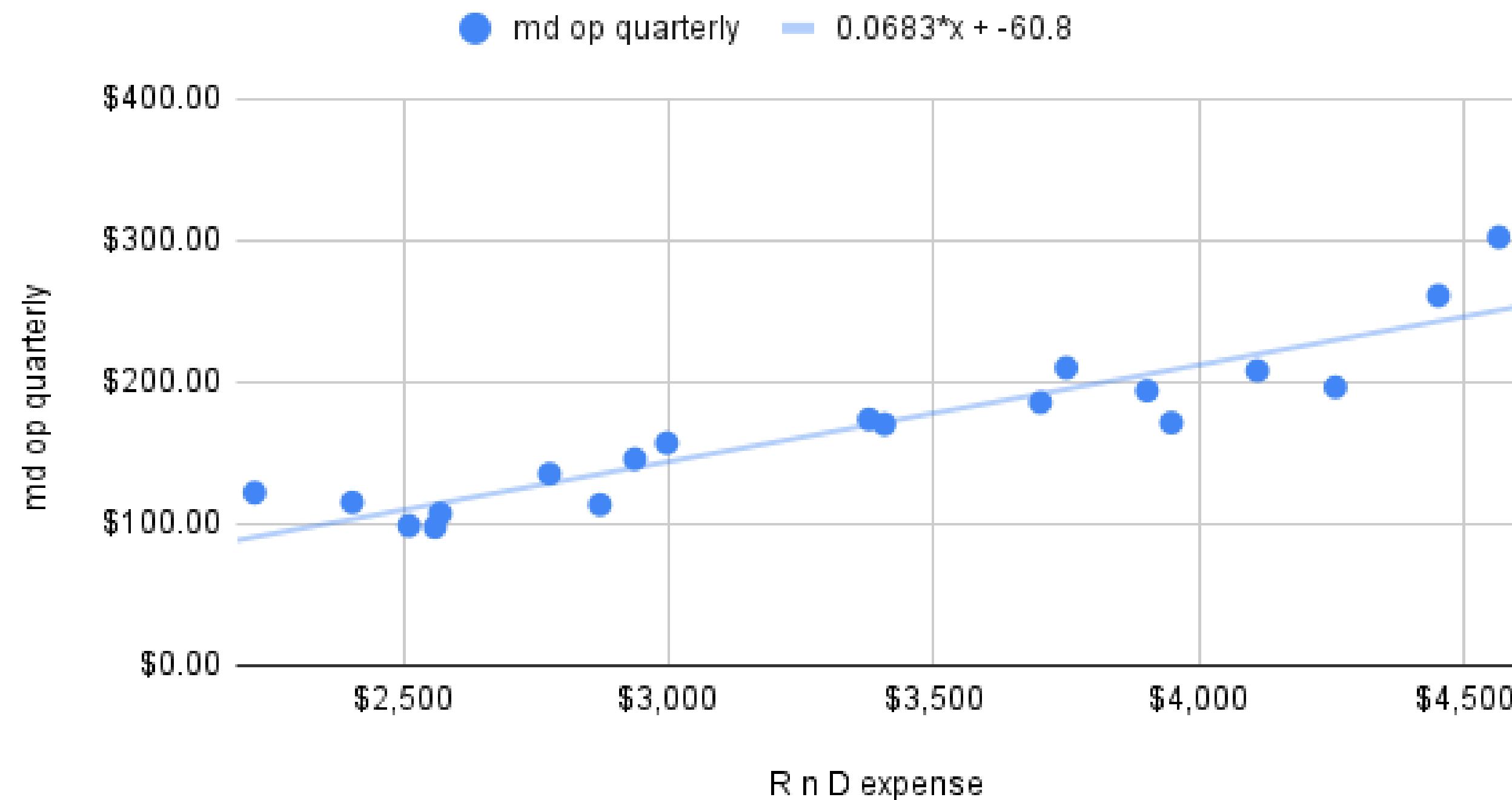
- Dataset on apple stock price and expense on apple Research and Development(quarterly) from 2015 to 2020
- Greater than 1200 tuples
- Attributes analyzed and predicted : closing, opening, highest, lowest price and volume

LINEAR REGRESSION

- Did linear regression on median of opening stock price, closing stock price with expense on R and D.
- Found that the correlation coefficient for median of opening stock price and expense on R and D = 0.9208660377
- and the correlation coefficient for median of closing stock price and expense on R and D = 0.9219555868

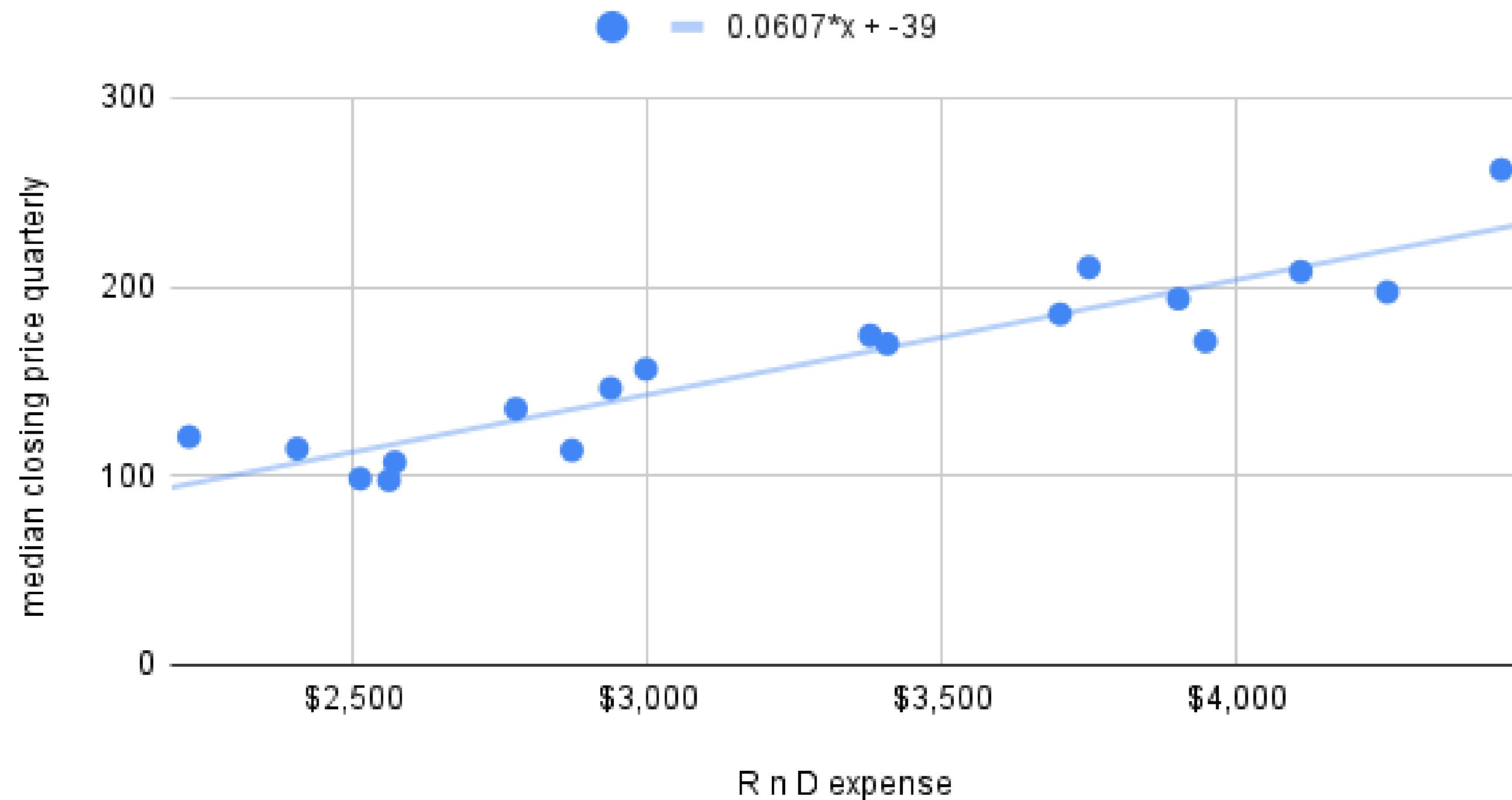
REGRESSION LINE CHART

md op quarterly vs R n D exp



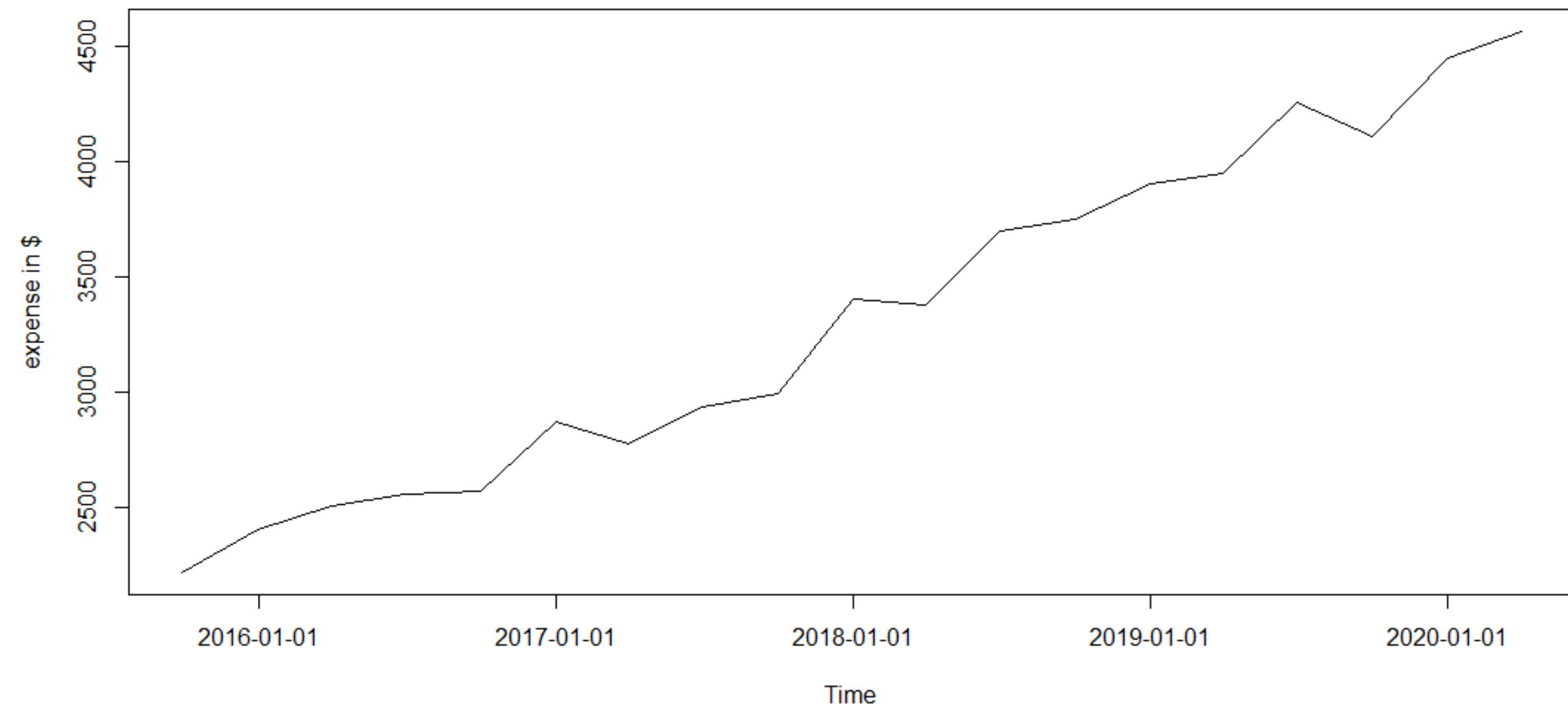
REGRESSION LINE CHART

md cp quarterly vs R n D exp

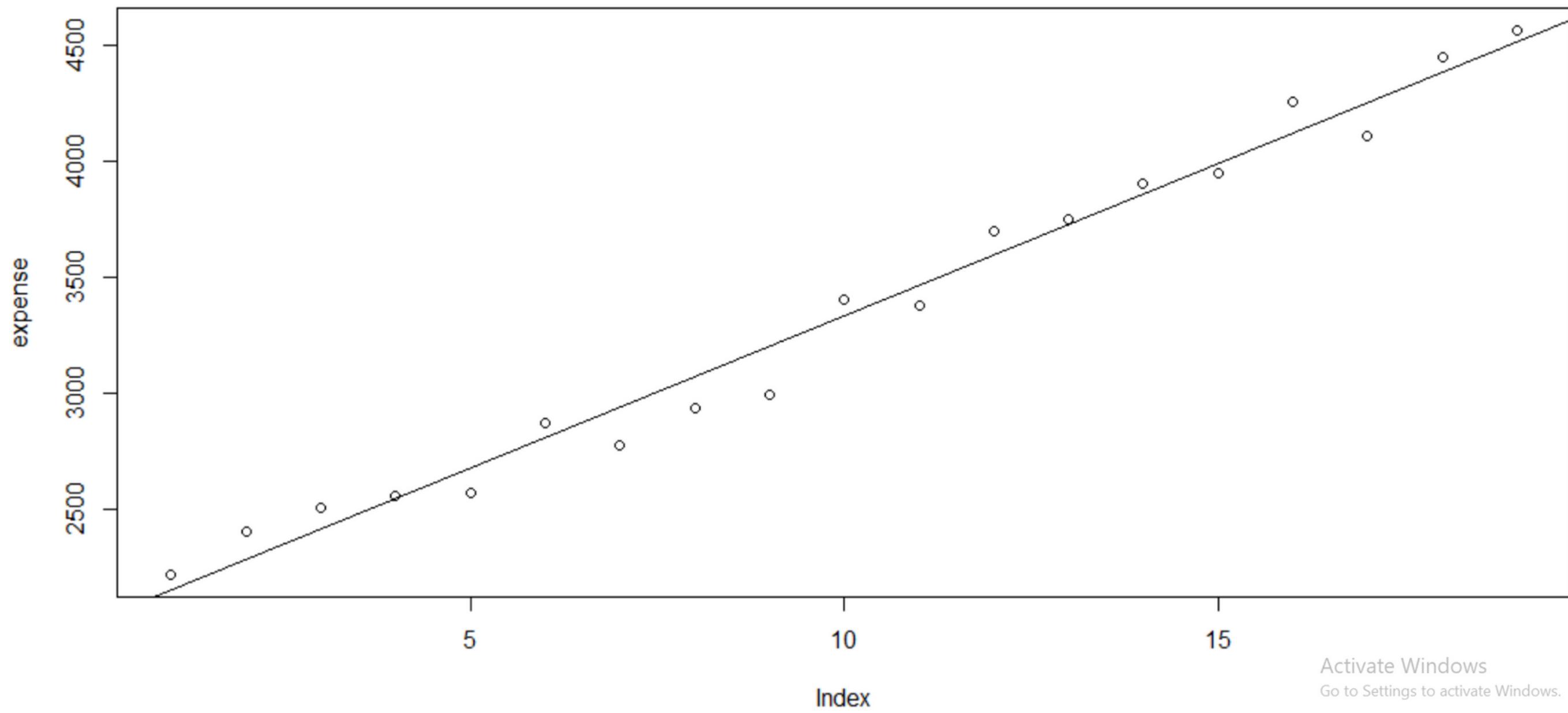


PREDICTING EXPENSE ON R AND D USING TIME SERIES ANALYSIS IN R

- Used ARIMA modelling in R for predicting.
 - **Original dataset**



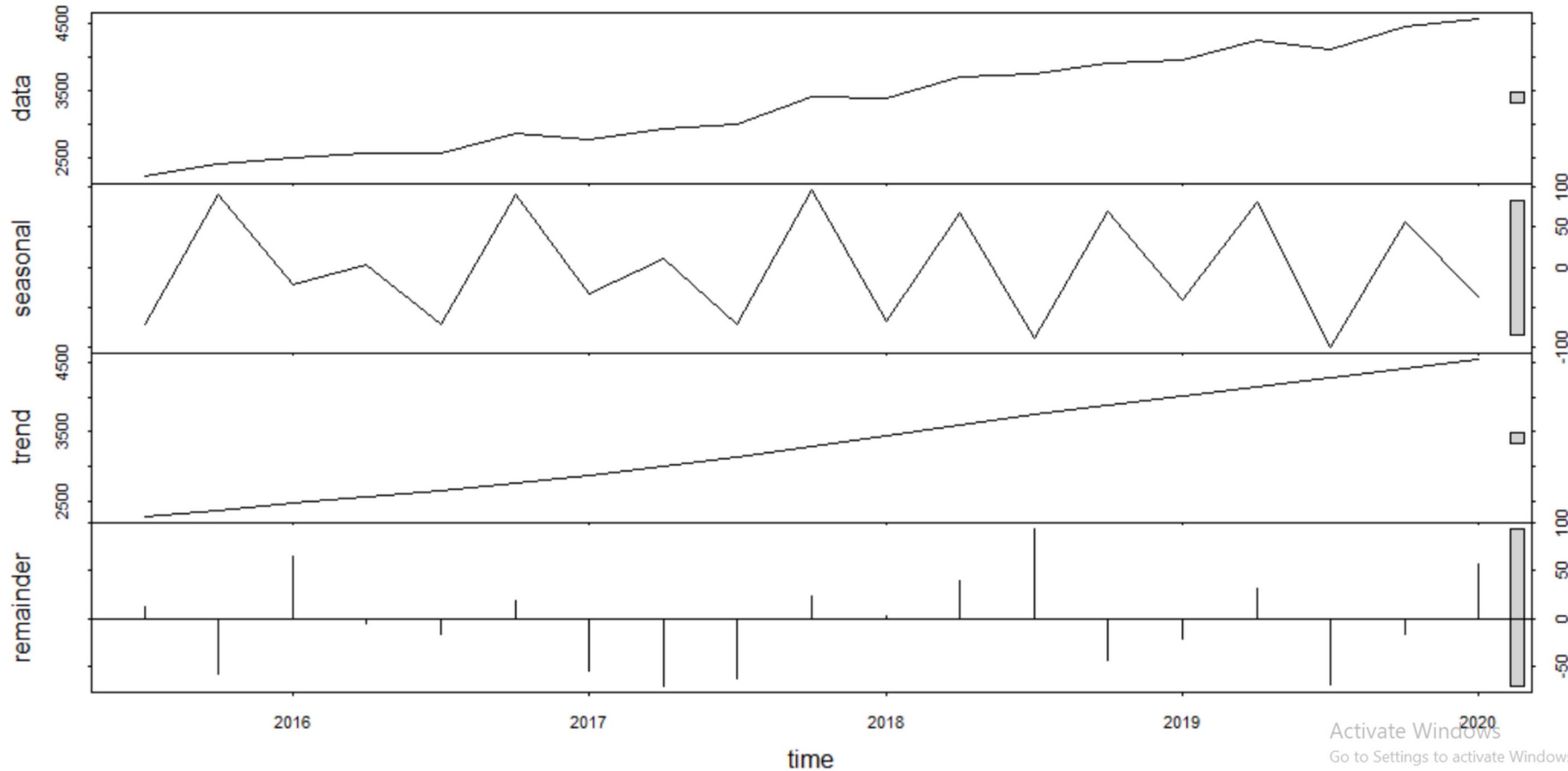
LINEAR MODEL FOR EXPENSE VS TIME



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STL DECOMPOSITION OF TIME

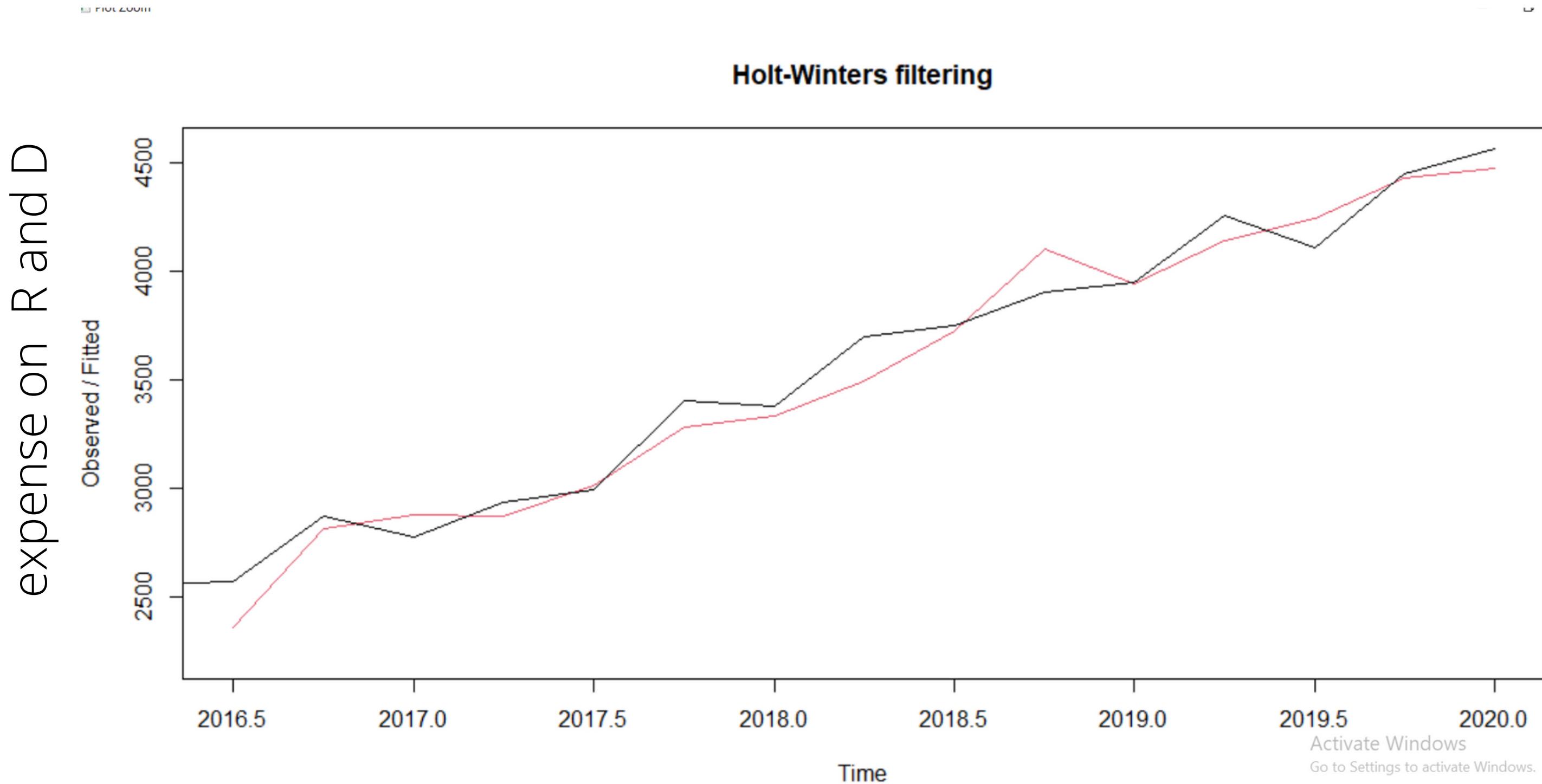
SERIES DATA



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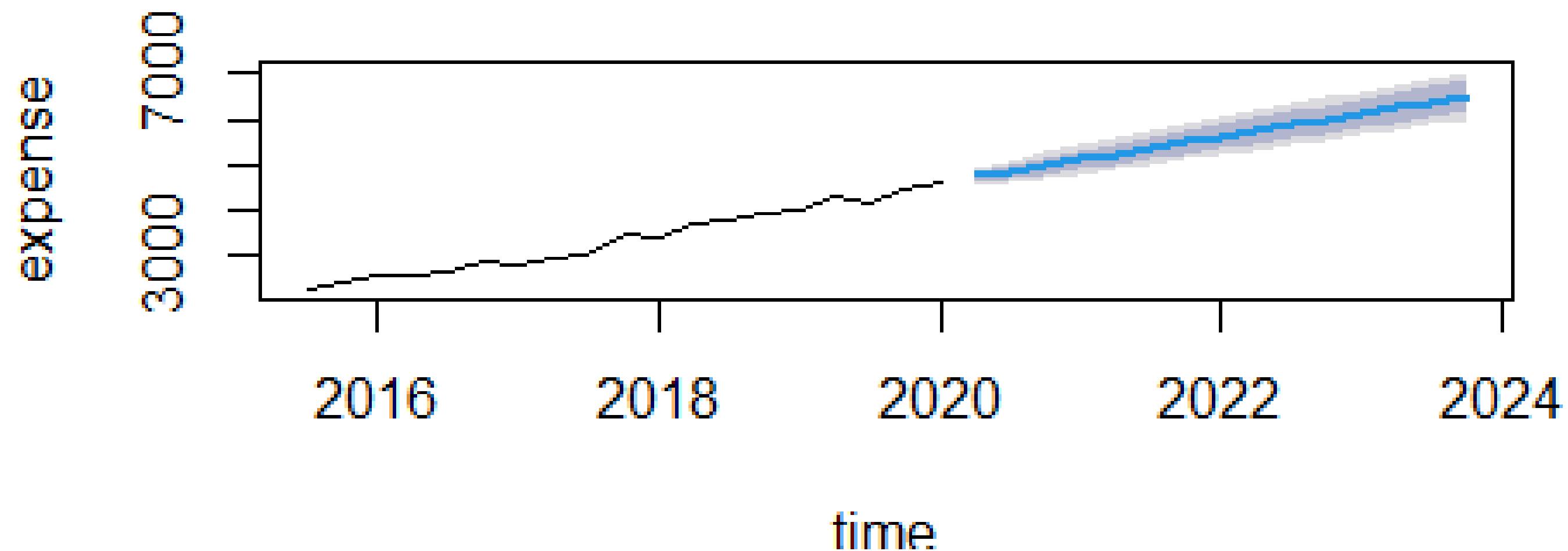
SMOOTHING OF TIME SERIES

DATA



FORECASTING OF R AND D EXPENSE

Graph of forecasted expense

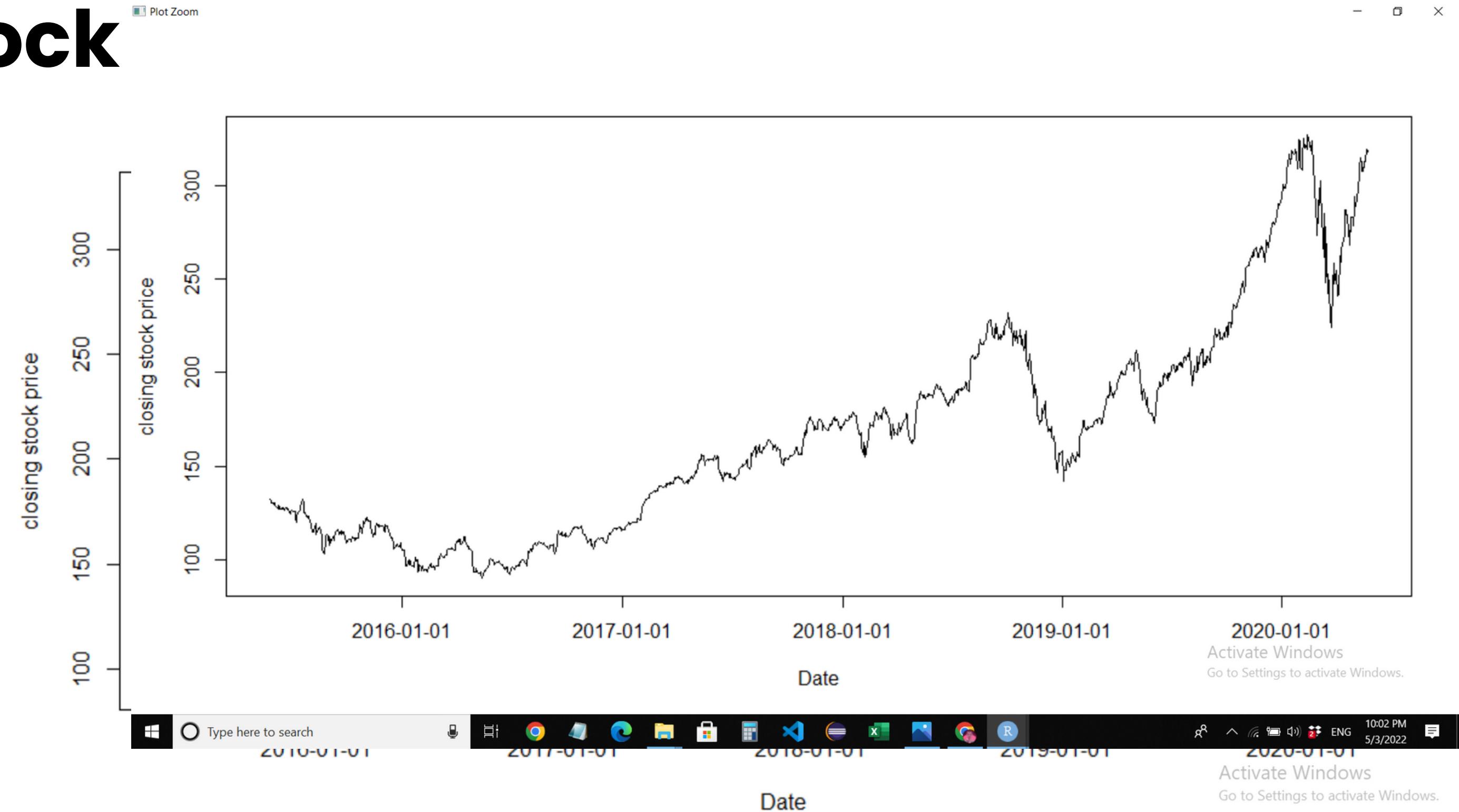


USED LINEAR REGRESSION LINE

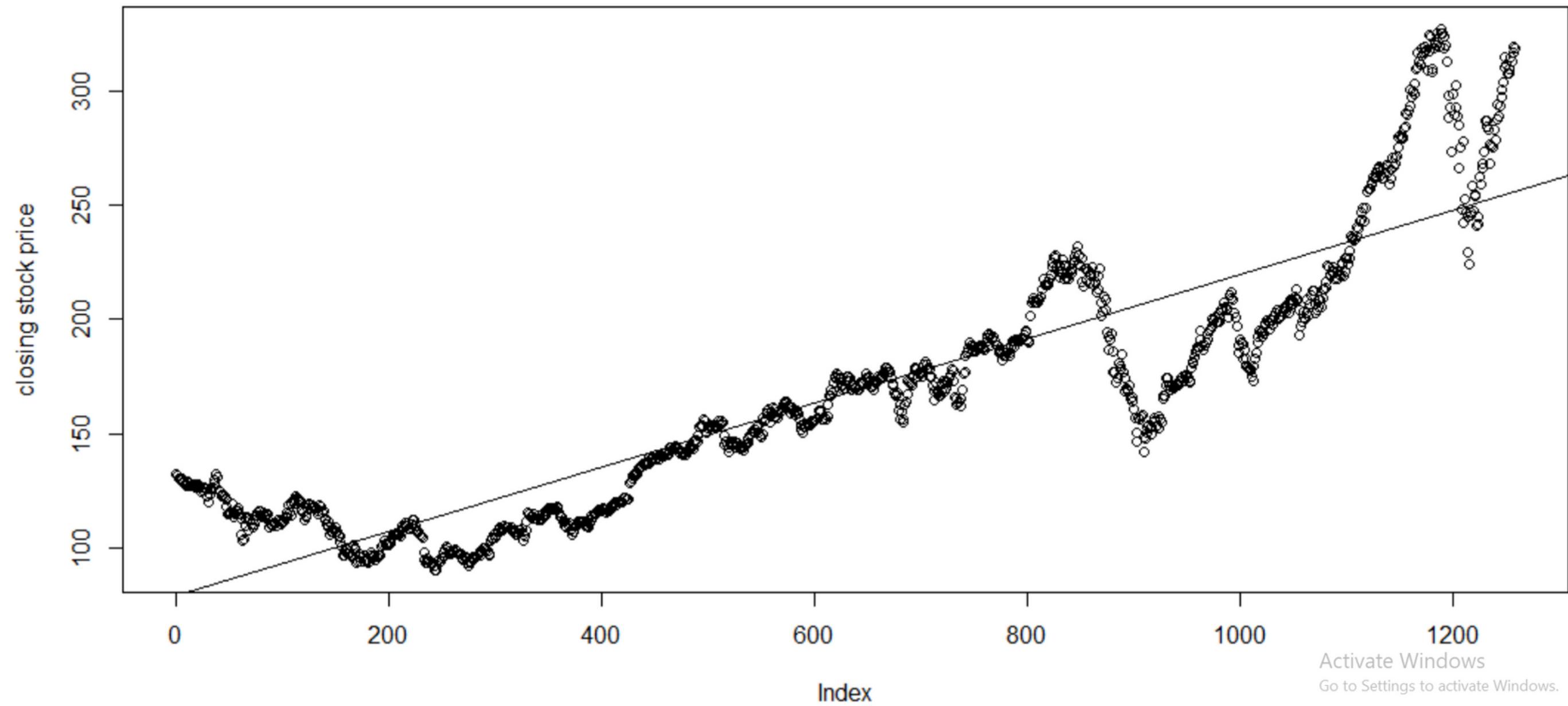
- For predicting quarterly opening and closing stock price with the help of forecasted expense on R and D

E	F	year	quarter	G	H	I
year	quar			predicted expense	predicted opening price	predicted closing price
		2020	2	\$4,705	\$260.55	\$246.59
		2020	3	\$4,827	\$268.89	\$254.01
		2020	4	\$4,961	\$278.06	\$262.16
		2021	1	\$5,087	\$286.67	\$269.81
2020	2	2021	2	\$5,219	\$295.67	\$277.80
2020	3	2021	3	\$5,347	\$304.40	\$285.56
2020	4	2021	4	\$5,477	\$313.31	\$293.48
2021	1	2022	1	\$5,606	\$322.10	\$301.29
2021	2	2022	2	\$5,736	\$330.97	\$309.17
2021	3	2022	3	\$5,865	\$339.78	\$317.01
2021	4	2022	4	\$5,995	\$348.64	\$324.88
2022	1	2023	1	\$6,124	\$357.46	\$332.72
2022	2	2023	2	\$6,253	\$366.31	\$340.58
2022	3	2023	3	\$6,383	\$375.14	\$348.43
2022	4	2023	4	\$6,512	\$383.98	\$356.29
2023	1					
2023	2			\$6,253	\$366.31	\$340.58
2023	3			\$6,383	\$375.14	\$348.43
2023	4			\$6,512	\$383.98	\$356.29

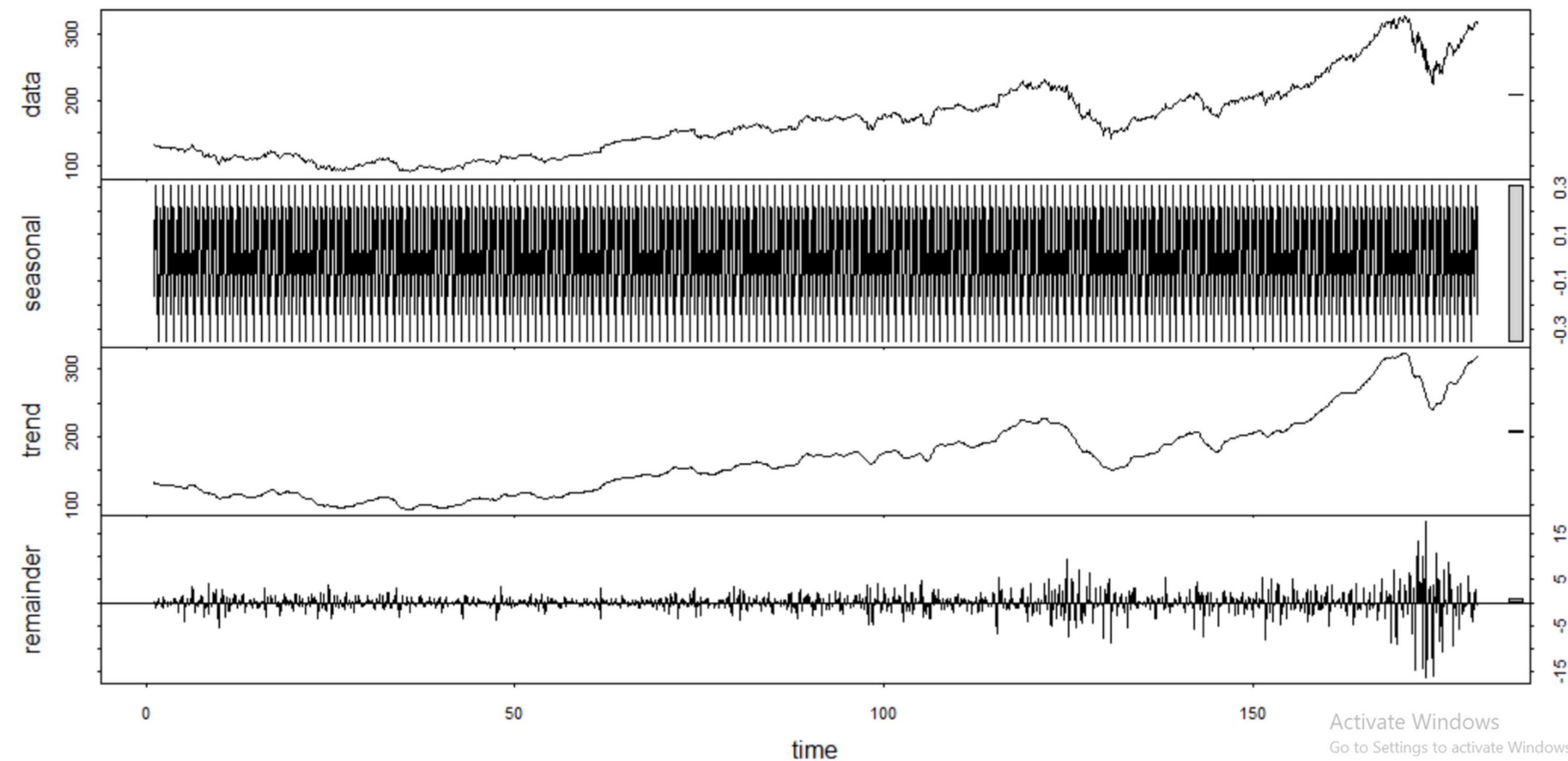
Time series dataset of closing stock



Linear Model of closing stock price

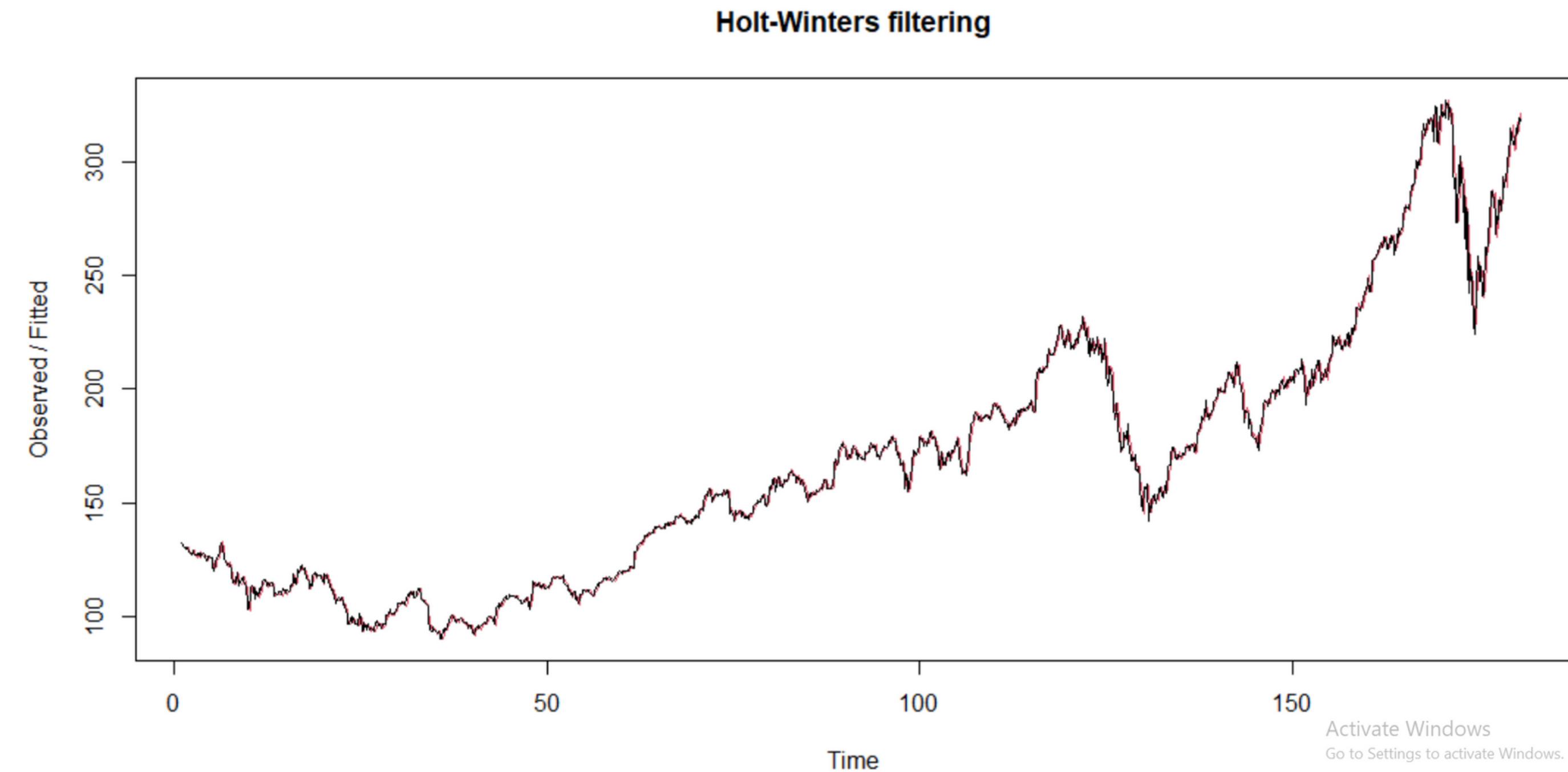


stl decomposition of closing stock price



smooothning of closing stock price

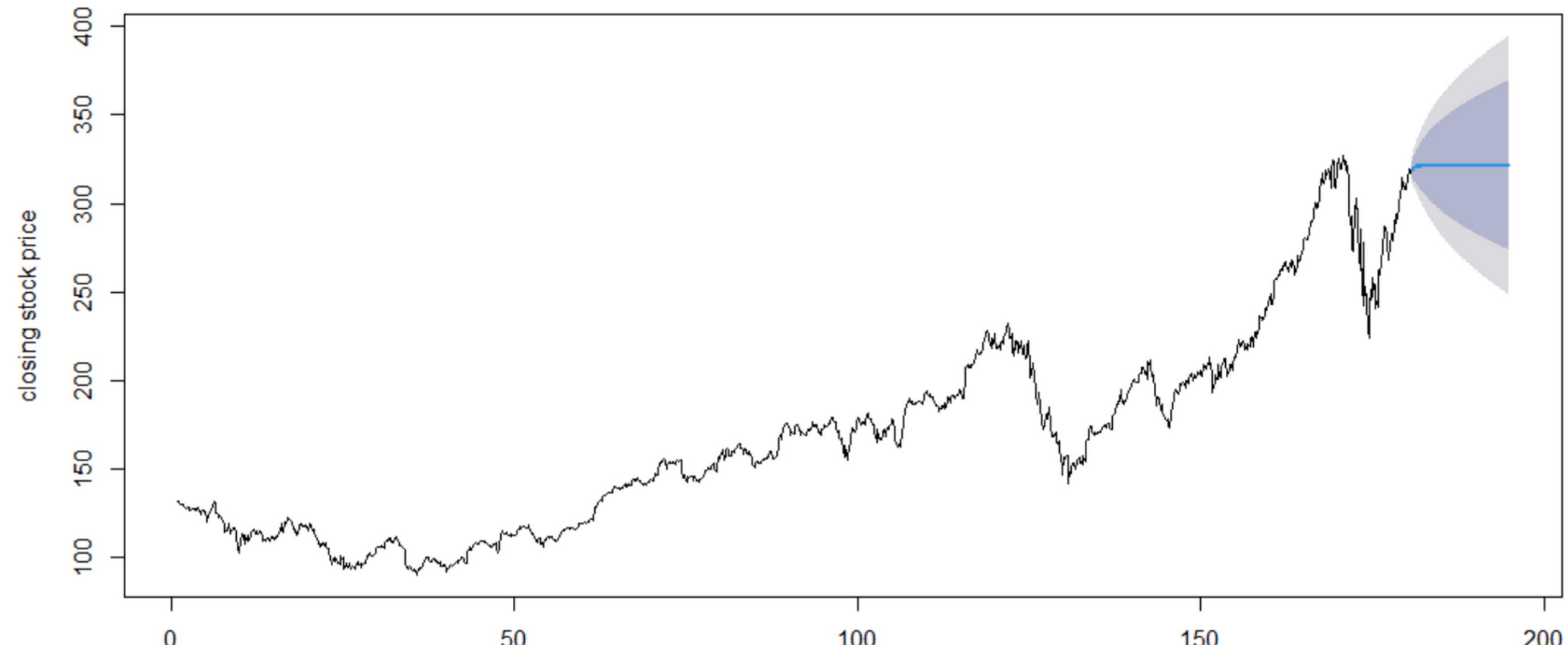
- Using HoltWinters method



Prediction of closing price

- Using arima modelling

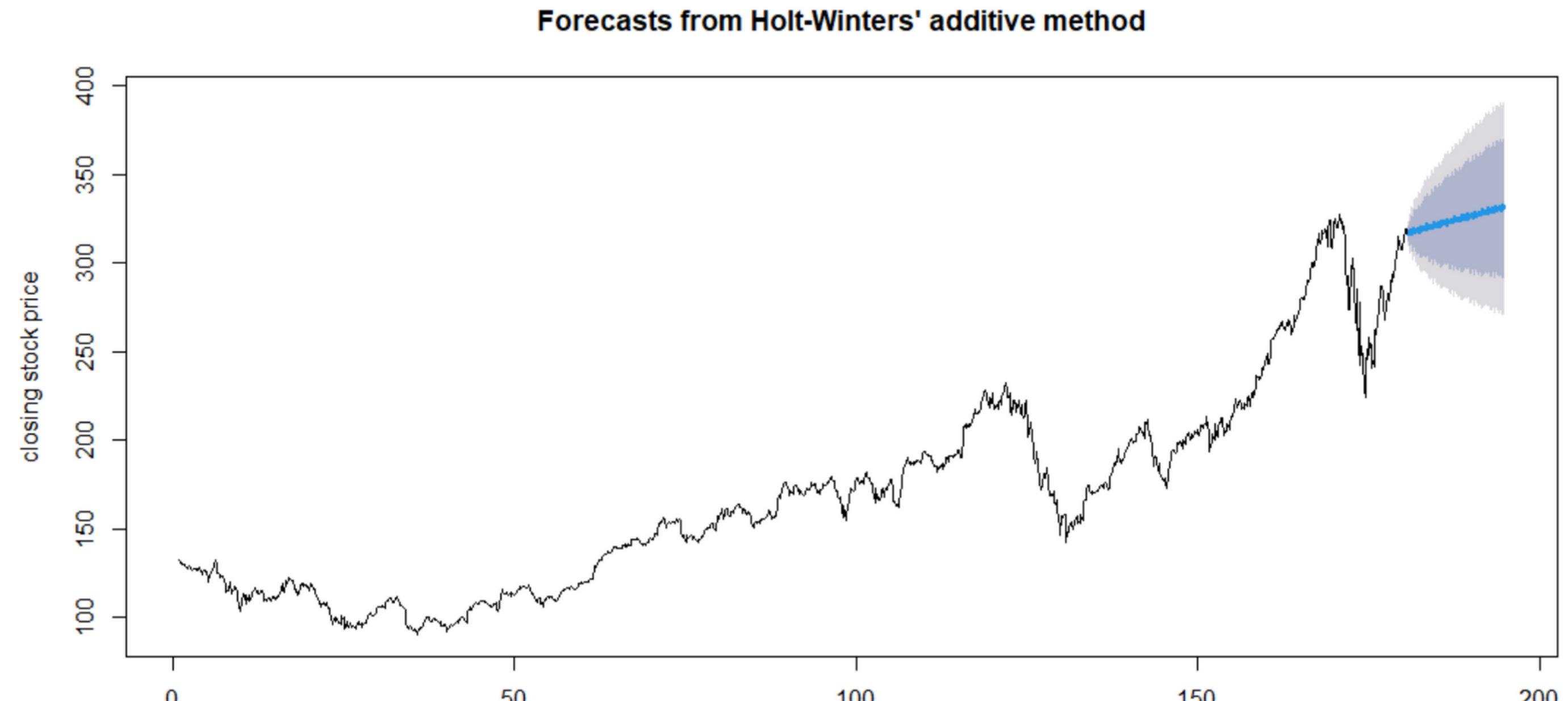
Forecasts from ARIMA(0,1,1)(0,0,2)[7]



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Prediction of closing price

- By Holtwinters method

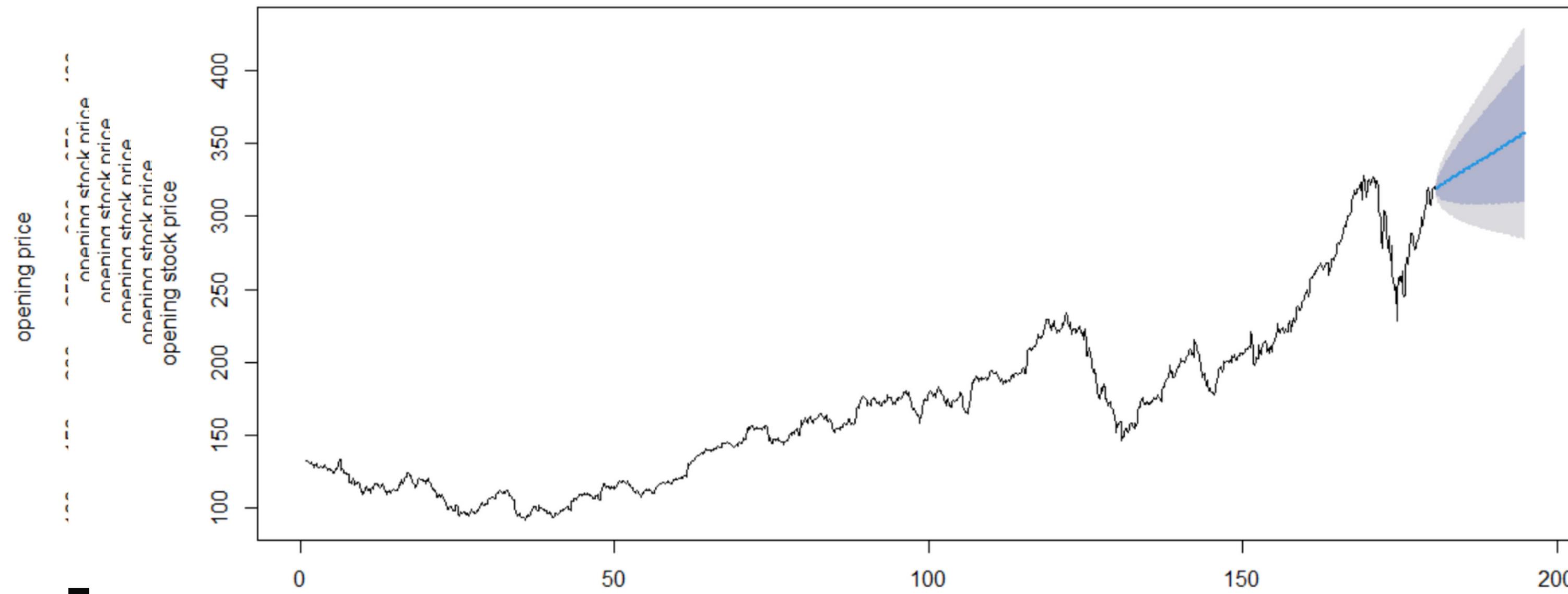


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Prediction of opening price

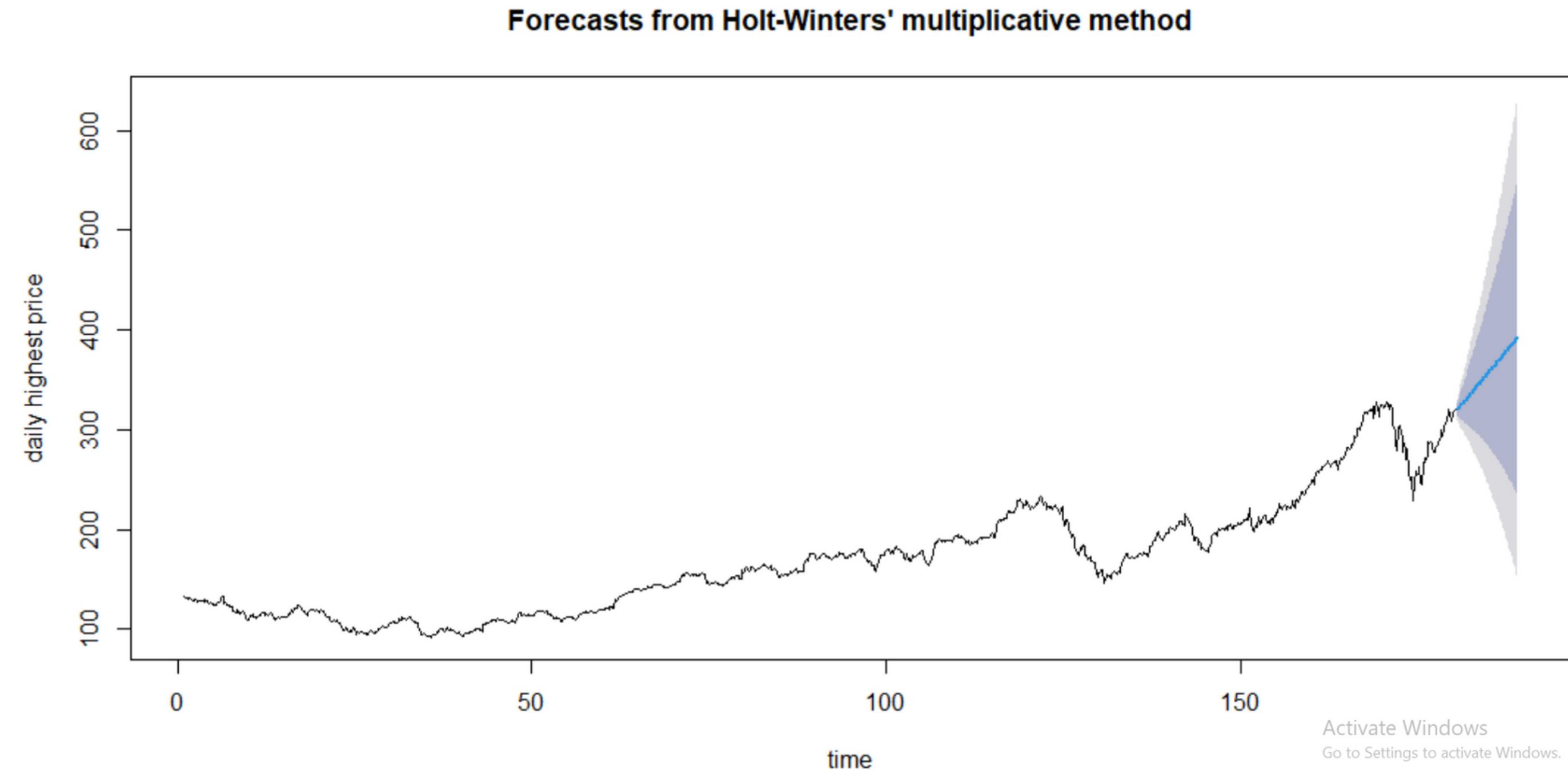
- By Holtwinters method

Forecasts from Holt-Winters' additive method



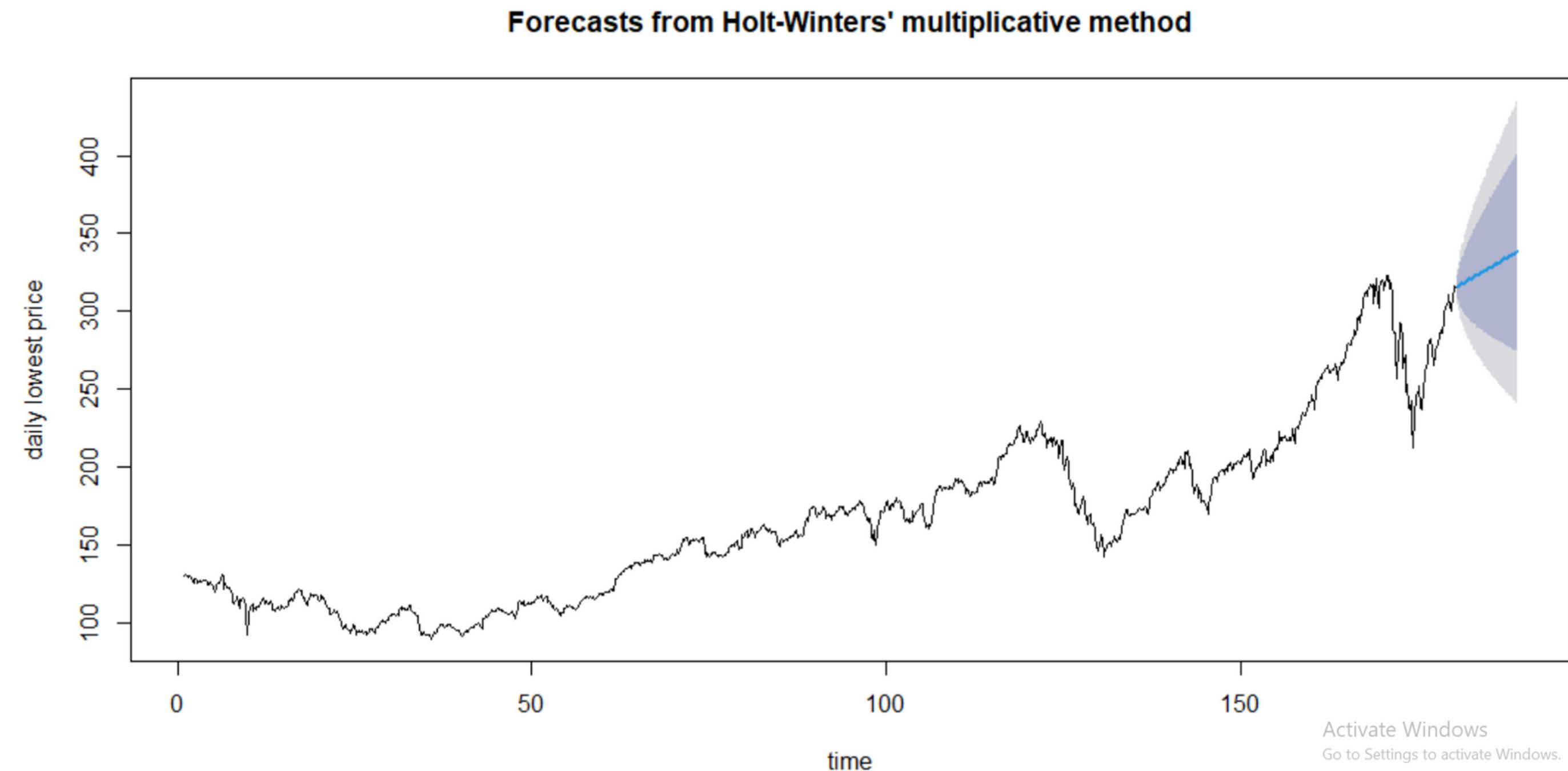
Prediction of highest price

- By Holtwinters method



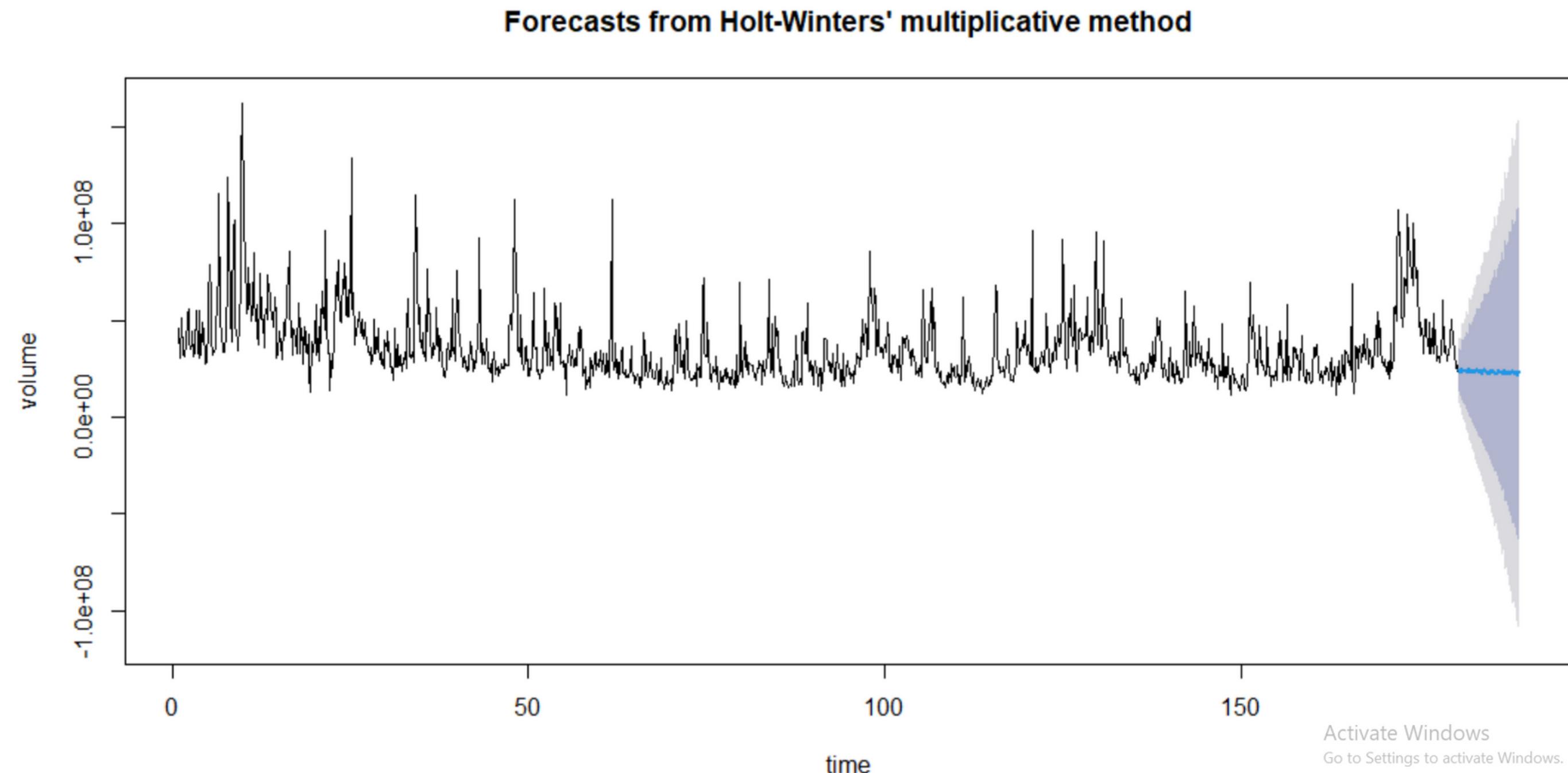
Prediction of lowest price

- By Holtwinters method



Prediction of volume

- Volume is number of shares traded each day
- By Holtwinters method



Predicted values (next 20)

- By Holtwinters method

closing price	opening price	highest price	lowest price	volume
: Forecast 315.2843	: Forecast 320.1090	: Forecast 315.9209	: Forecast 316.2409	: Forecast 24618007
318.0150	321.2688	316.6292	316.3914	22823498
316.3708	322.5056	316.8885	317.0675	23743919
318.7699	323.7874	317.3236	318.1139	24986287
318.8659	325.8604	318.3771	319.3555	23775658
316.1653	326.6609	317.6659	319.6625	24022247
320.2687	327.7864	317.9636	319.1445	23353729
316.3755	328.6379	318.5327	319.1786	24465090
319.1152	329.7961	319.2438	319.3266	22681601
317.4647	331.0334	319.5022	320.0051	23596168
319.8716	332.3169	319.9378	321.0573	24830667
319.9673	334.4124	320.9969	322.3064	23627446
317.2569	335.2019	320.2768	322.6124	23872364
321.3739	336.3249	320.5739	322.0857	23207886
317.4668	337.1668	321.1446	322.1163	24312176
320.2153	338.3234	321.8585	322.2618	22539707
318.5586	339.5612	322.1159	322.9427	23448420
320.9732	340.8465	322.5520	324.0007	24675050
321.0687	342.9643	323.6167	325.2574	23479237
318.3485	343.7428	322.8877	325.5624	23722484



THANK YOU