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COVID19-PREDICTION MODEL ,DATA VISUALIZATION AND PREDICTION CURVE

ACCURACY 95 TO 97 %

The details about the scripts are just discussed below.The model is just a integrated model but for convenience its being divided into three ipnyb scripts. To show the output clearly.Its basically predicting :

- **Number of Covid-cases in India as a country in upcoming days,months and data visualization**
- **State wise prediction and data visualization**
- **International Prediction and data visualization**
- **Dynamic Indian Prediction Curve to show when this situation will end and upcoming prediction on year ,month and day basis upcoming.**

ALL MODELS GET AUTO-UPDATED DAILY AS IT FETCHES DIRECTLY THE DATA FROM ONLINE SOURCE WHEN EVER PERSON RUN THE SOFTWARE.NOTHING TO DO ONLY PRESS RUN ,SET THE DATE IS YOU WANT SPECIFIC PREDICTION OTHER WISE IT WILL GIT PREDICTION,CURVE,DATA VISUALIZATION BY ITS OWN OF COVID 19.ALL ARE ON AI BASED APPROACHES.

The scripts are discussed as follows with accuracy and comparison :

Script1: Statewise_prediction_COVID19:

This is based on stat computing ML Bayesian model with FbProphet model fir best predictions.It shows state wise Covid predictions of India in upcoming month.It get updated automatically as it fetch online data and gets automated trained by adaptive learning .

Here we took a state westbengal to predict by the model .All predictions got 97% Accuracy.

```
[ ]  #prediction of cases in Westbengal for date 28/04/2020
     fpd[(fpd['Date']>= '2020-04-28') & (fpd['Date']<= '2020-04-28')]
```

	Date	Predicted Cases of West Bengal
1044	2020-04-28	715.025797
1045	2020-04-28	715.025797
1046	2020-04-28	715.025797
1047	2020-04-28	715.025797
1048	2020-04-28	715.025797

FIG 1 : PREDICTION OF NUMBER OF TOMMOROW CASES IN WESTBENGAL

And the real number of cases on this date are :

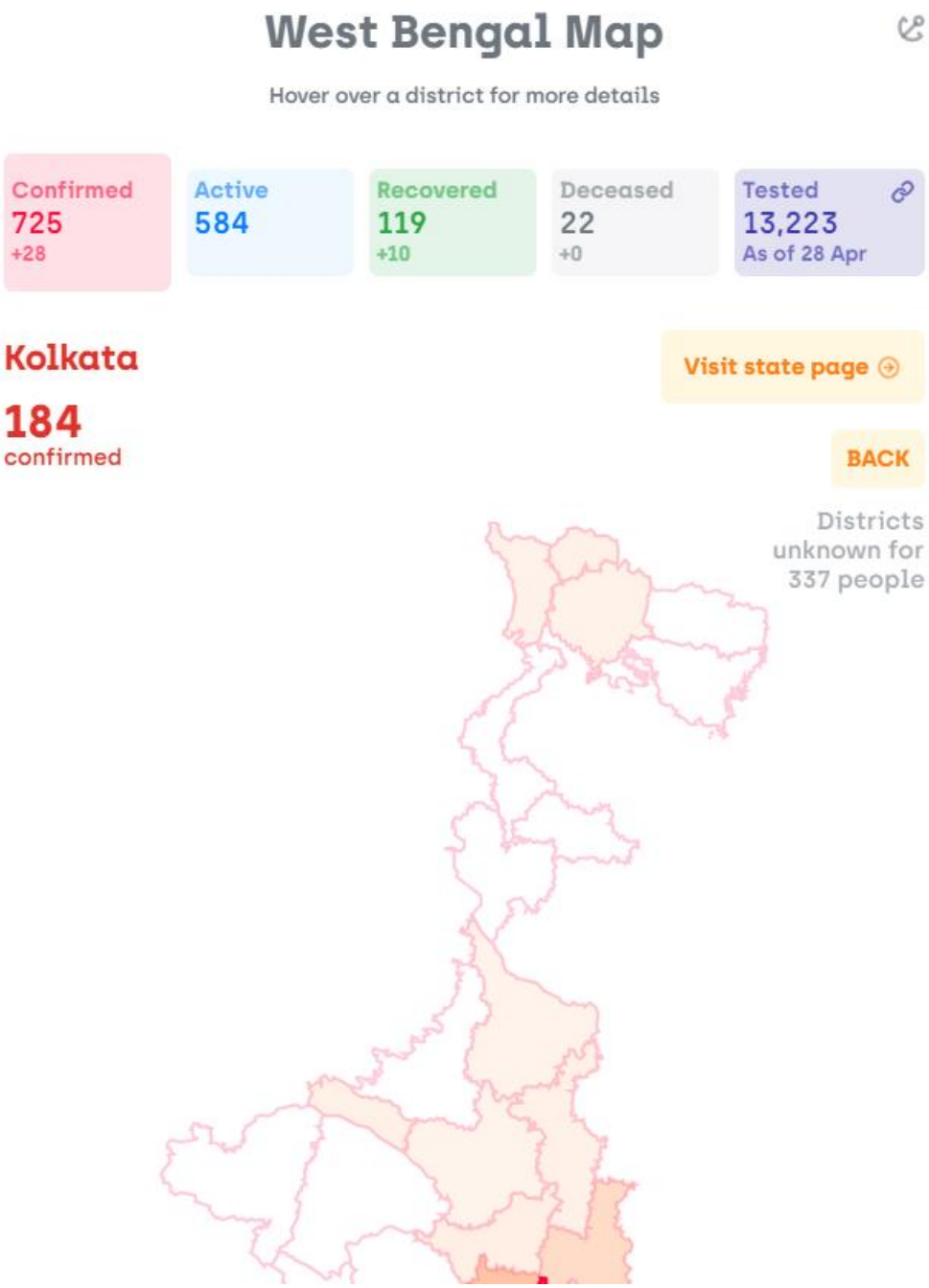


FIG 2: ACTUAL CASE FIGURE MATCHING

So we can see we are having good sort of prediction accuracy.

This model also shows a prediction curve to predict state wise corona report and upcoming case prediction with nature :

```
[ ] #Scatter plot to show probable state wise cases and its probability its for westbengal
    predict_fig = model.plot(forecast_pd, xlabel='date', ylabel='confirmed cases')
    display(predict_fig)
```

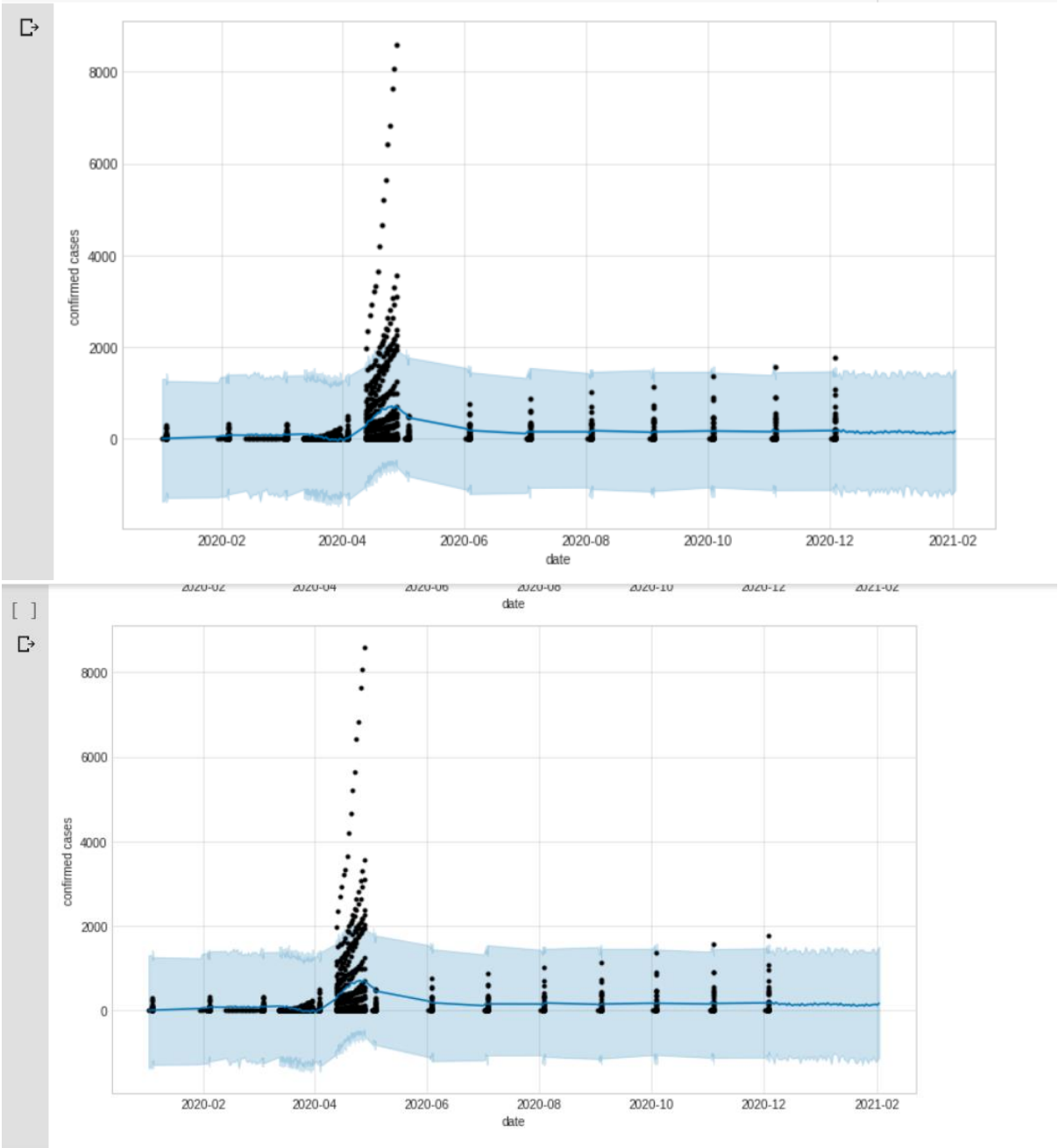


FIG 3 : STATE WISE (INDIA) COVID 19 STATUS AND UPCOMING PREDICTION

Script 2: India COVID19 PRED CURVE AND INTERNATIONAL PRED

This script is based on the same above mentioned tech stack .But it predicts with further advancement .Vedio is provided of the visual dynamic pred curve of India with nature,cases and all possible things.Along with this it provides number of upcoming cases in coming days in India as well all over the world :

Accuracy 95 to 97% as shown :

```
[36] #PREDICTION OF COVID CASES INDIA IN UPCOMING MONTHS AND DAYS JUST CHANGE THE DATE AND RUN THE SCRIPT FOR UPDATED RESULTS
     fpd[(fpd['Date']>= '2020-04-29') & (fpd['Date']<= '2020-04-30')]
```

	Date	Predicted Cases
90	2020-04-29	32607.528897
91	2020-04-30	34375.831146

```
(by = 'Predicted Cases',ascending=False).iloc[1].Date.date(), "\n","High
```

```
Date:  2020-05-14
 Highest Predicted: 47213.0
```

FIG 4 : UPCOMING CASES OF COVID 19 INDIA

Actually the cases on this date are :

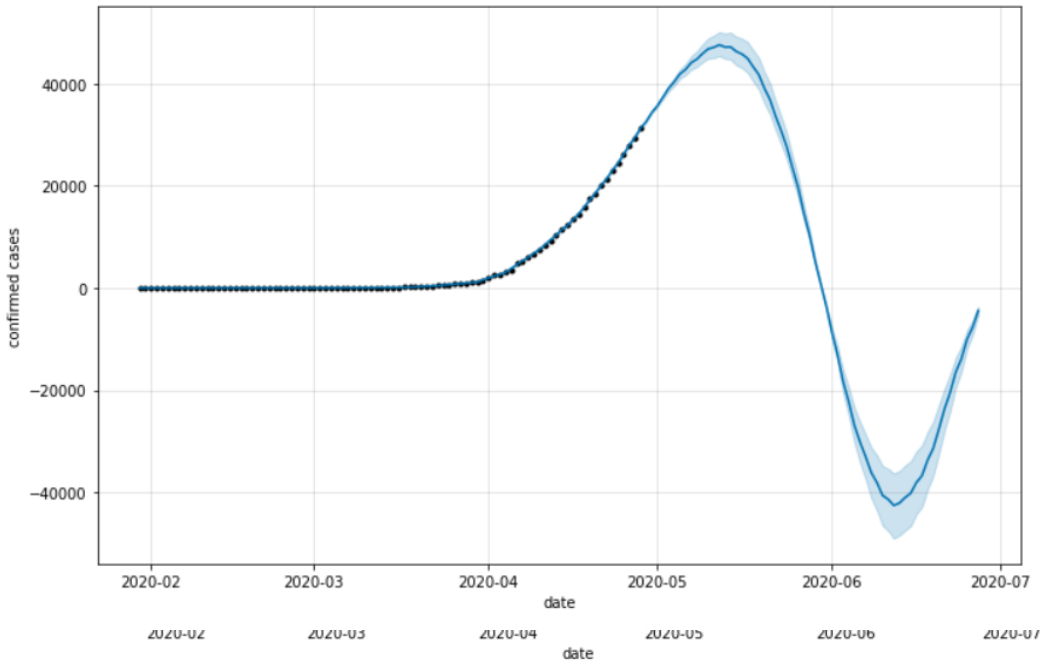
At present live ;

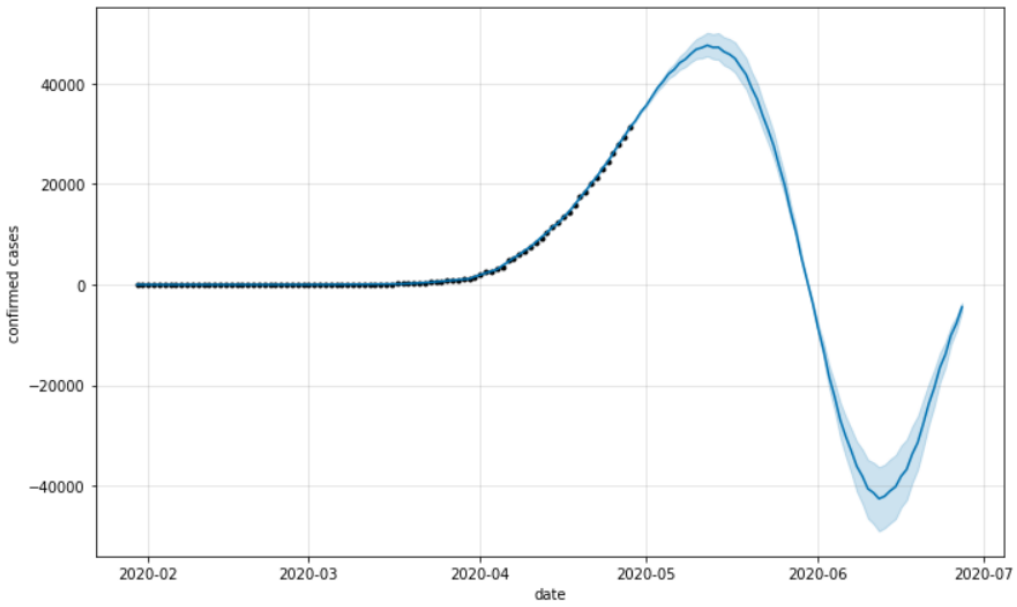
FIG 4 : REAL CASE MATCHING

Hence we can see we are having a good accuracy .

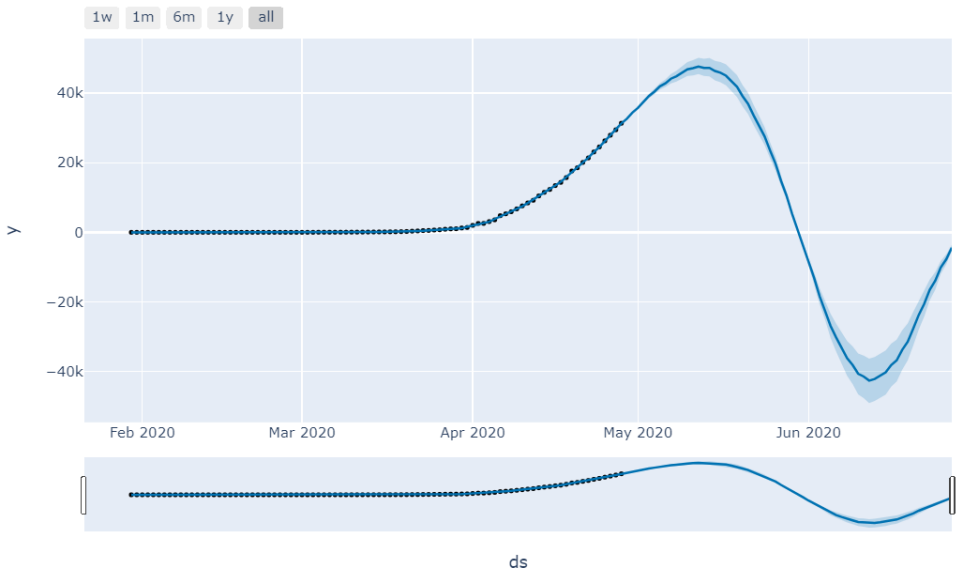
Other output images are shown and vedio provided :

```
[30] #PREDICTION CURVE OF COVID19 INDIA FOR UPCOMING MONTHS
     #CURVE IS EXACTLY SIMILAR AS PROVIDED BY RESEARCH OF SINGAPORE UNIVERSITY
     predict_fig = model.plot(forecast_pd, xlabel='date', ylabel='confirmed cases')
     display(predict_fig)
```





[31]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Apr 2020
May 2020
Jun 2020
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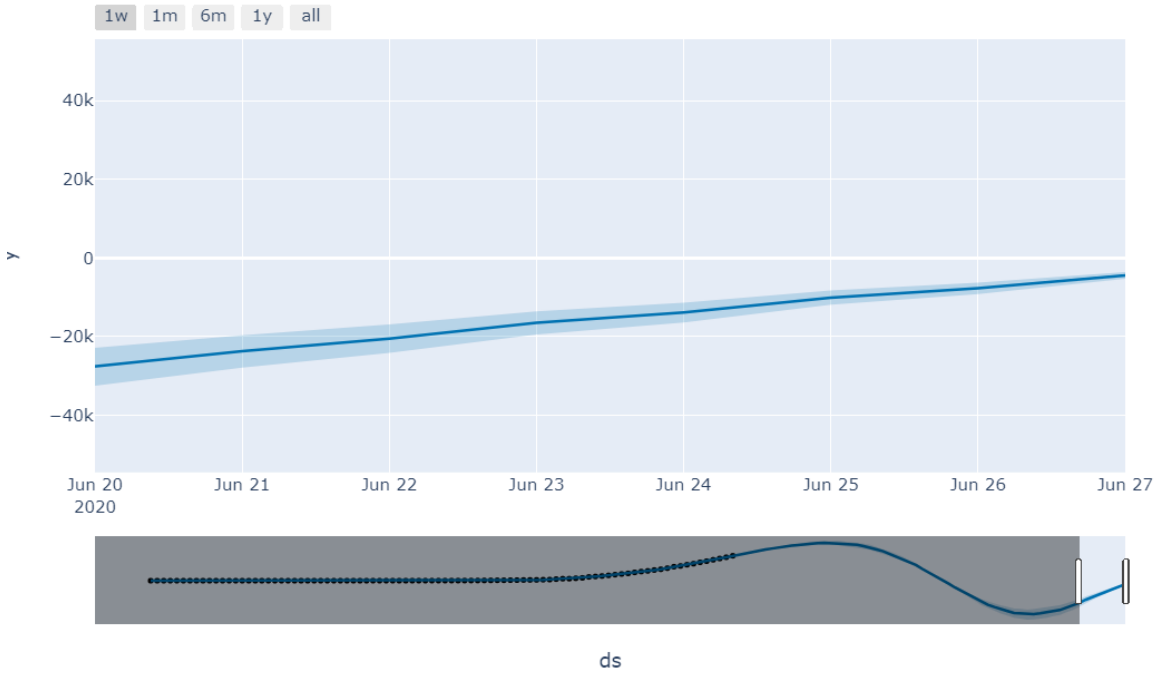
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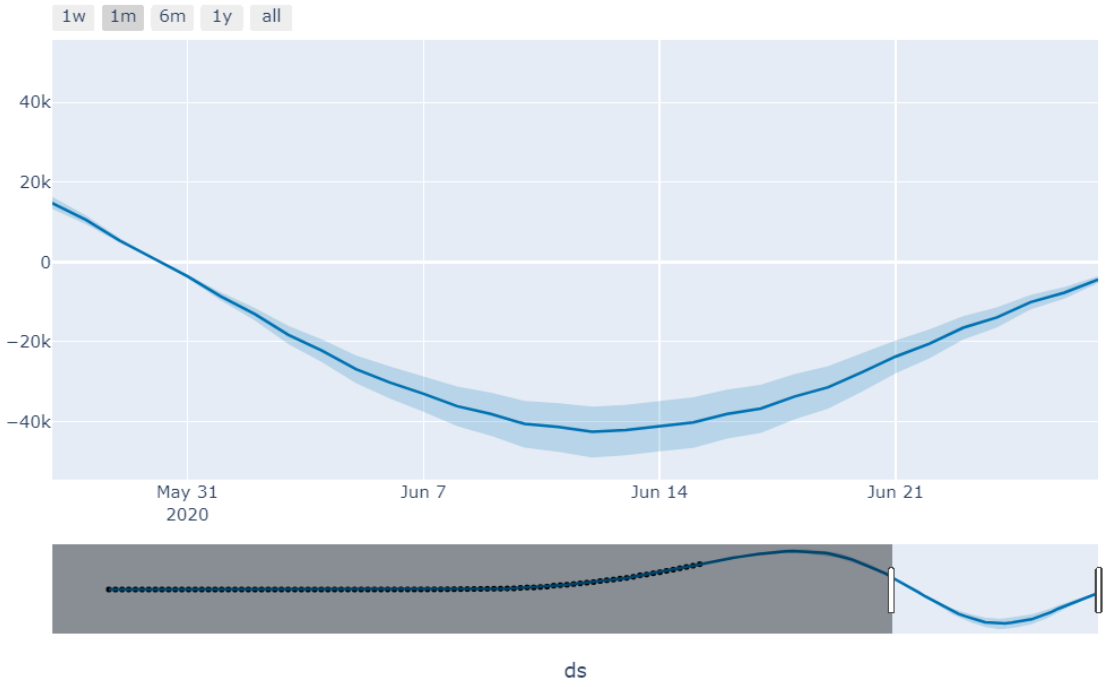
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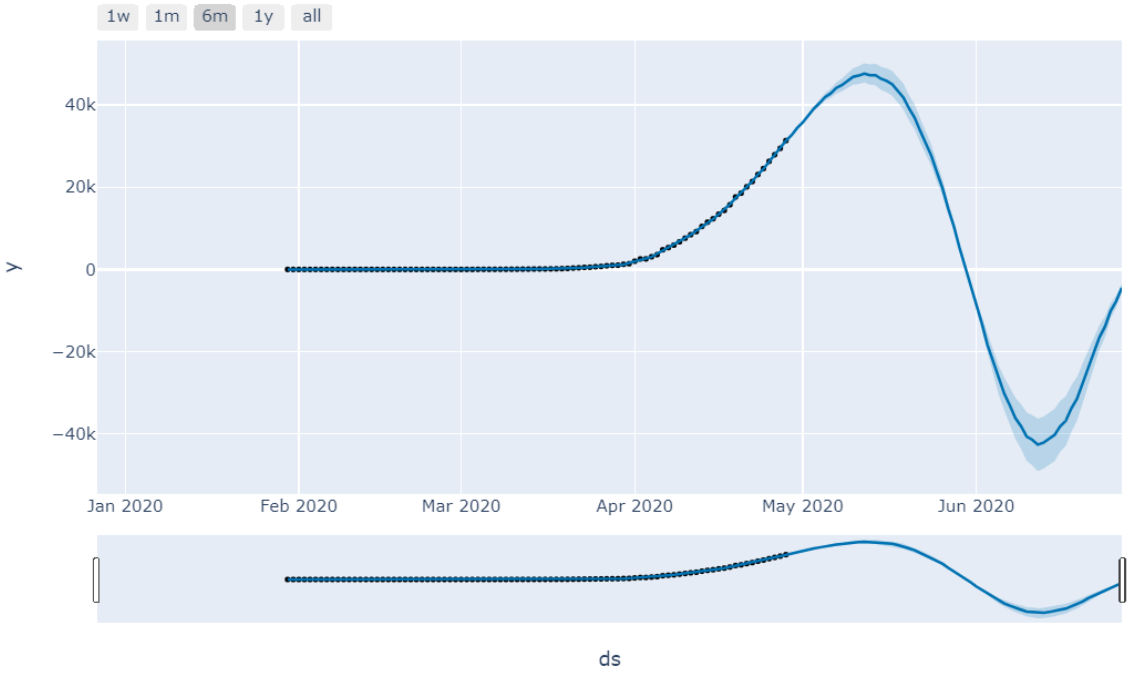
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May 2020
Jun 2020
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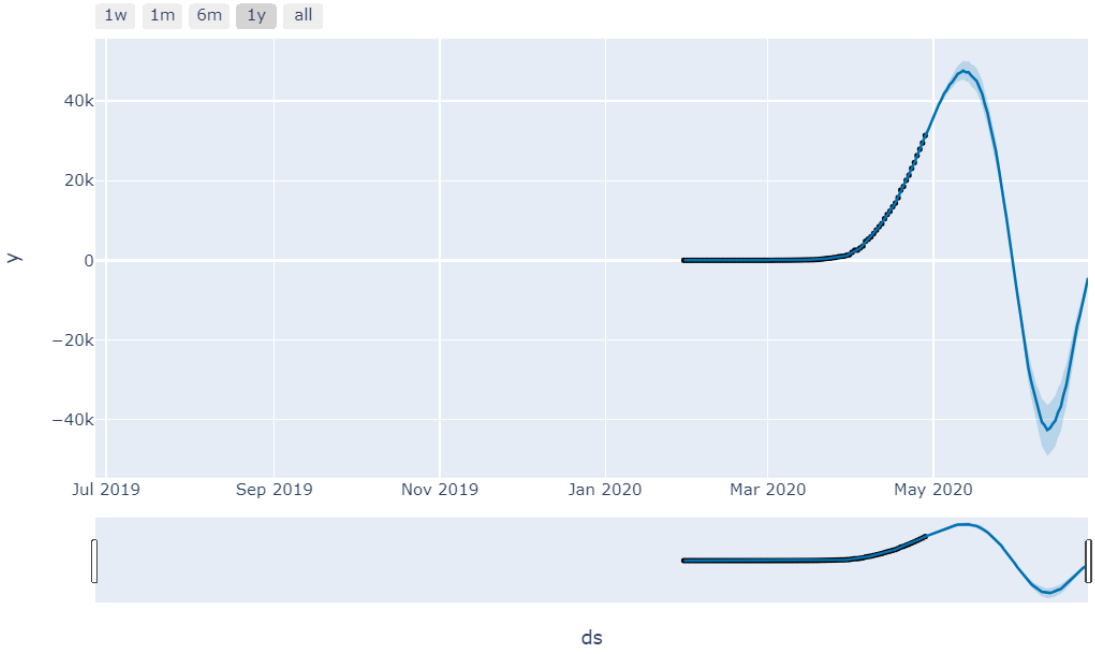

FIG 5 : DYNAMIC PREDICTION CURVE INDIA DETAILS IN VEDIO

International Case prediction as shown :

```
[45] #INTERNATIONAL PREDICTION OF COVID19
     pd.set_option('display.float_format', lambda x: '%.3f' % x)
     final_top.sort_values('Highest Prediction', ascending=False).reset_index()
```

	index	Date	country	Highest Prediction
0	0	2020-01-30	US	1152931.809
1	0	2020-01-30	Spain	396089.009
2	0	2020-01-30	Germany	383611.097
3	0	2020-01-30	France	263586.847
4	0	2020-01-30	Italy	204425.881
5	0	2020-01-30	Iran	109920.258
6	0	2020-01-30	Switzerland	29937.439

```
[46] #INTERNATIONAL UPCOMING TOP COVID19 COUNTRIES
     final_top.sort_values('Highest Prediction', ascending=False).reset_index().head()
```

	index	Date	country	Highest Prediction
0	0	2020-01-30	US	1152931.809
1	0	2020-01-30	Spain	396089.009
2	0	2020-01-30	Germany	383611.097
3	0	2020-01-30	France	263586.847
4	0	2020-01-30	Italy	204425.881

FIG 6 : INTERNATIONAL CASE PREDICTION

Script 3: INTERNATIONAL DATA MODELLING AND PRED

Its based on a Japanese Kalman filter based on r2py R in Python script model with docker container of jupyter+R+python+h20.io+spark.It is showing international case prediction by visual data approach .Its is also updated daily .

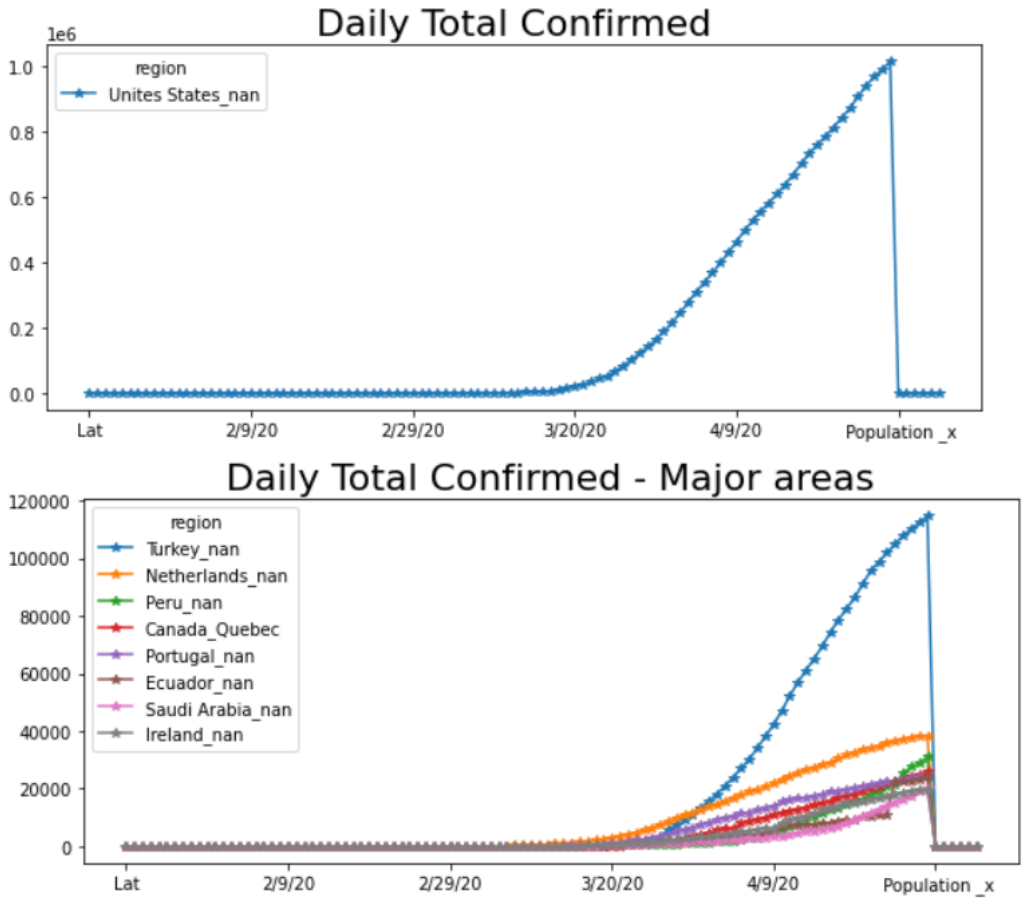

FIG 9 : INTERNATIONAL CASE PREDICTION DATA VISUALIZATION