COVID19 MODELLING

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MODELLING OF COVID_19 IN KENYA

In this project we're going to predict the Cumulative number of covid_19 cases in Kenya

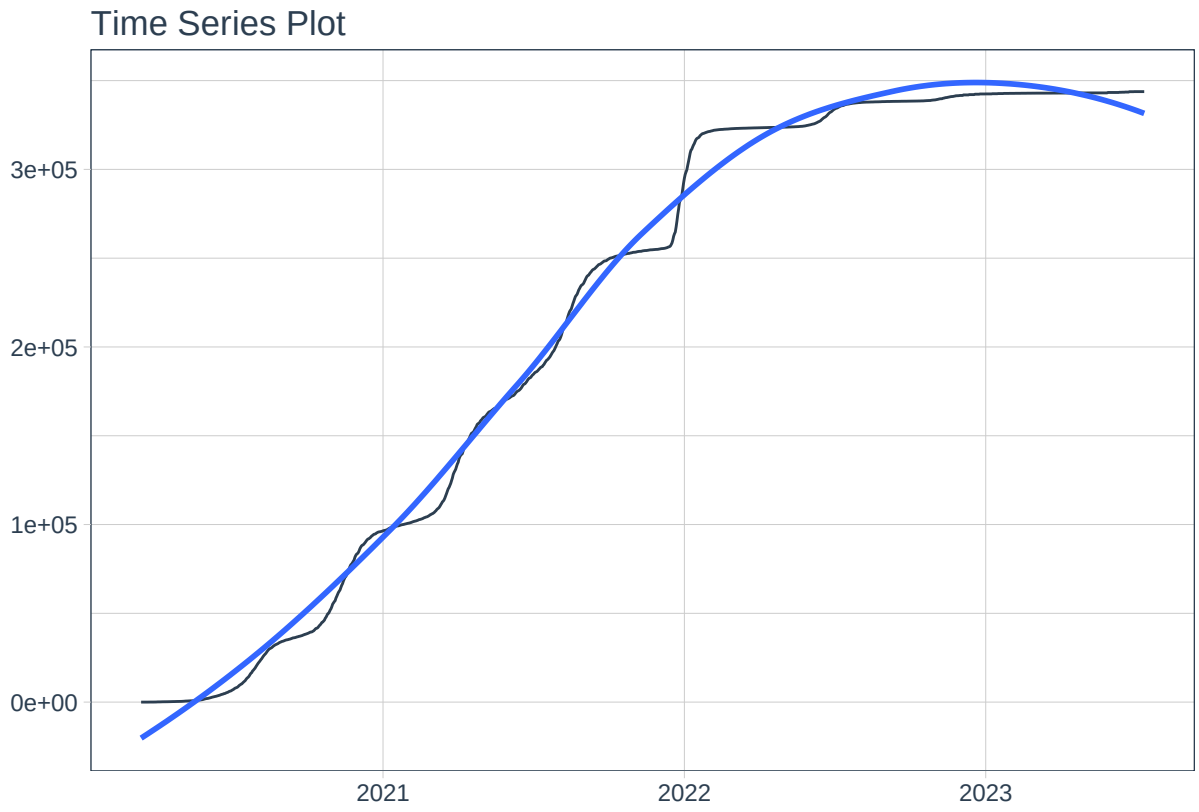
```
#IMPORT LIBRARIES
suppressPackageStartupMessages(require(webshot2))
suppressPackageStartupMessages(require(dplyr))
suppressPackageStartupMessages(require(officer))
suppressPackageStartupMessages(require(modeltime))
suppressPackageStartupMessages(require(tidymodels))
suppressPackageStartupMessages(require(tidyverse))
suppressPackageStartupMessages(require(timetk))
suppressPackageStartupMessages(require(tibble))
suppressPackageStartupMessages(require(report))
suppressPackageStartupMessages(require(tinytex))
suppressPackageStartupMessages(require(rmarkdown))
```

```
#LOAD DATA
raw <- read.csv("C:/Users/langa/OneDrive/Desktop/Dataset/owid-covid-data.csv")
view(raw)
```

```
#CHOOSE THE LOCATION==KENYA AND CUMULATIVE CASES
#data cleaning
kenya_cov <- raw %>% select(location,'date', 'total_cases')%>% filter(location=="Kenya",
                                                                      date>="2020-03-14")

kenya_cov <- kenya_cov %>% select(date,total_cases ) %>% as_tibble()
kenya_cov$date <- as.Date(kenya_cov$date)
```

```
#ADD A VISUAL
kenya_cov %>% plot_time_series(date, total_cases, .interactive = F)
```




```
#data spliting /training$testing
set.seed(123)
split <- initial_time_split(kenya_cov, prop = .8)
```

```
#Define the model
arima_spec <- arima_reg(mode = "regression") %>%
  set_engine(engine ="auto_arima") %>%
  fit(total_cases~date,training(split))
```

```
## frequency = 7 observations per 1 week
```

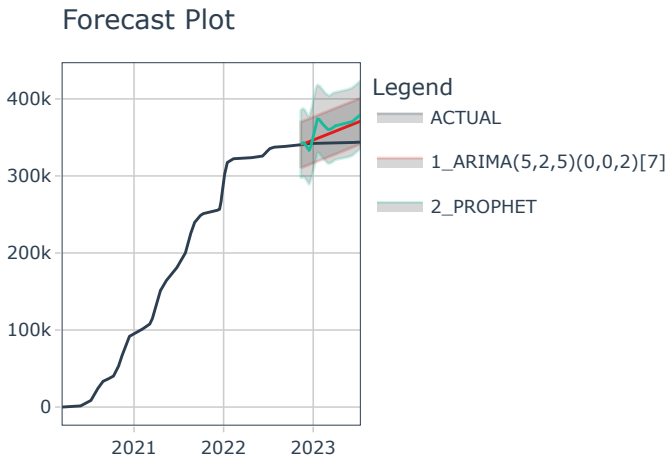
```
#fbprophet model
prophet_model <- prophet_reg(mode = 'regression') %>% set_engine(engine = 'prophet') %>%
  fit(total_cases~date,training(split))
```

```
## Disabling daily seasonality. Run prophet with daily.seasonality=TRUE to override this.
```

```
#add fitted model to table
modeltable <- modeltime_table(arima_spec, prophet_model)
```

```
#calibrate the model to testing set
modelcalibrate <- modeltable %>% modeltime_calibrate(new_data = testing(split))
```

```r
#visualize the forecast for the test
modelcalibrate %>% modeltime_forecast(
  new_data = testing(split),
  actual_data = kenya_cov
) %>%
  plot_modeltime_forecast()
```




```
#accuracy metrics
modelcalibrate %>% modeltime_accuracy() %>%
```

```
table_modeltime_accuracy()
```

Search

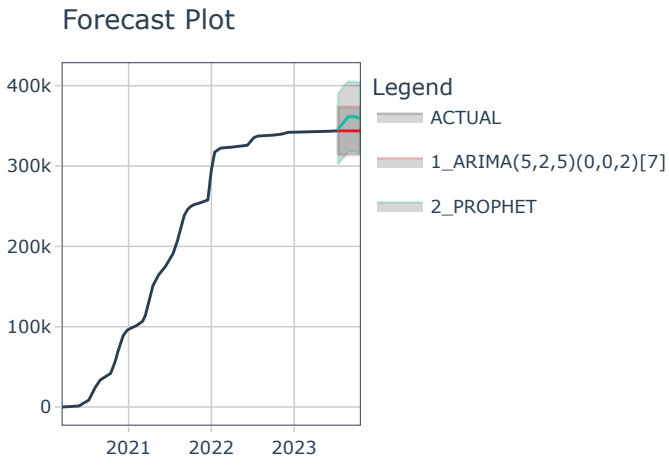
.model_id	.model_desc	.type	mae	mape	mase
1	ARIMA(5,2,5)(0,0,2)[7]	Test	12756.89	3.72	844.21
2	PROPHET	Test	20356	5.93	1347.09

```r
#refit to full dataset
refit <- modelcalibrate %>% modeltime_refit(data = kenya_cov)
```

```
## frequency = 7 observations per 1 week

## Disabling daily seasonality. Run prophet with daily.seasonality=TRUE to override this.
```

```r
refit %>% modeltime_forecast(h="100 days", actual_data = kenya_cov,round(0)) %>%
  plot_modeltime_forecast()
```


Forecast Plot
400k
300k
200k
100k
0
2021
2022
2023
Legend
ACTUAL
1_ARIMA(5,2,5)(0,0,2)[7]
2_PROPHET