Global_infected

September 7, 2020

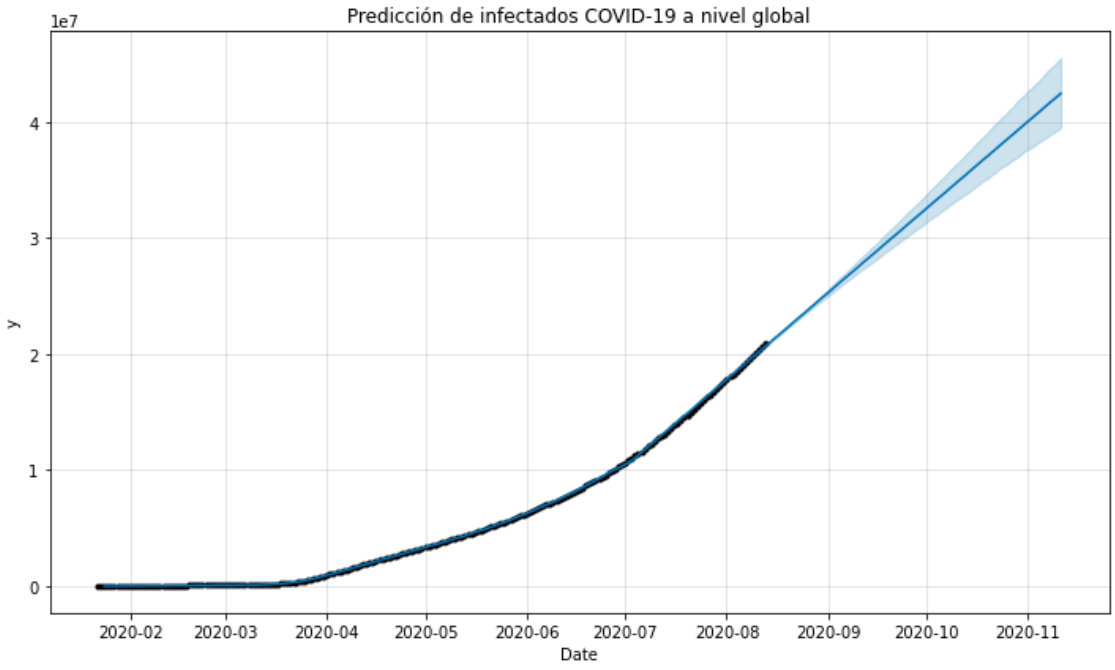
[23]:
```
import pandas as pd
import janitor

def get_data():
    URL_CSV="https://raw.githubusercontent.com/CSSEGISandData/COVID-19/master/
 ↪csse_covid_19_data/csse_covid_19_time_series/
 ↪time_series_covid19_confirmed_global.csv"
    df = pd.read_csv(URL_CSV)
    df['Country/Region'] = df['Country/Region'].replace({'US':'United States of␣
 ↪America'})
    return df
df = get_data()
```

[24]:
```
import janitor
import pandas as pd
import pandas_flavor as pf
import fbprophet
from matplotlib import pyplot as plt
from IPython.display import display, HTML



LISTA_COLUMNAS_A_BORRAR = ['Province/State', 'Country/Region', 'Lat', 'Long']



df = get_data()
df = df.remove_columns(LISTA_COLUMNAS_A_BORRAR)
df
df = pd.DataFrame( df.sum())
df.columns=['y']
df.index = pd.to_datetime(df.index)
df['ds'] = df.index
df = df.reset_index()


df = df.remove_columns(['index'])
```

```
df_prophet = fbprophet.Prophet(changepoint_prior_scale=0.15)
df_prophet.fit(df)

df_forecast = df_prophet.make_future_dataframe(periods=90, freq='D')
# Make predictions
df_forecast = df_prophet.predict(df_forecast)
df_forecast

df_forecast = df_forecast[df_forecast["yhat"] >= 0]
df_forecast.loc[df_forecast.yhat_lower < 0, 'yhat_lower'] = 0


df_prophet.plot(df_forecast, xlabel = 'Date' )
plt.title('Predicción de infectados COVID-19 a nivel global'   )

display(HTML(pd.DataFrame(df_forecast).to_html()))
```

```
INFO:fbprophet:Disabling yearly seasonality. Run prophet with
yearly_seasonality=True to override this.
INFO:fbprophet:Disabling daily seasonality. Run prophet with
daily_seasonality=True to override this.
```

```
<IPython.core.display.HTML object>
```



[25]:
```
df = get_data()
```

[26]:
```
import janitor
import datetime
import numpy as np

def pipeline_populations():
    """ Cogemos un dataframe de poblaciones"""

    URL="https://population.un.org/wpp/Download/Files/1_Indicators%20(Standard)/
↪CSV_FILES/WPP2019_TotalPopulationBySex.csv"
    THIS_YEAR = datetime.datetime.now().year

    return (
        pd.read_csv(URL)
        .filter_on( f""" Time  ==  {THIS_YEAR} & Variant == "Medium" """ )
        .select_columns(['Location','PopTotal'])
        .join_apply(lambda x: x['PopTotal'] * 1000 ,␣
↪new_column_name="PopMillions" )
        .remove_columns(['PopTotal'])
        .rename_column('PopMillions' , 'PopTotal')
        .transform_column('PopTotal',np.int64)
        .rename_column('Location' , 'Country/Region')
    )


populations = pipeline_populations()
populations
```

[26]:

	Country/Region	PopTotal
70	Afghanistan	38928341
954	Africa	1340598113
1838	African Group	1338826591
1989	African Union	1339423920
2140	African Union: Central Africa	158619638
…	…	…
277315	World	7794798728
278199	World Bank Regional Groups (developing only)	6528762227
278350	Yemen	29825967
279234	Zambia	18383956
280118	Zimbabwe	14862927

[477 rows x 2 columns]

[27]:
```
df = get_data()
df_country = pd.DataFrame()
df_country['Country/Region'] = df['Country/Region']
```

```
df_country['infected last_day'] = df.iloc[:,-1] - df.iloc[:,-2]
df_country.set_index('Country/Region')
df_country
```

[27]:

	Country/Region	infected last_day
0	Afghanistan	79
1	Albania	154
2	Algeria	488
3	Andorra	4
4	Angola	53
..	…	…
261	West Bank and Gaza	307
262	Western Sahara	0
263	Yemen	6
264	Zambia	162
265	Zimbabwe	97

[266 rows x 2 columns]

[28]:
```
df_country_enrich = pd.merge(df_country, populations, on="Country/Region")
df_country_enrich['Infected/Million'] =  1000000 * df_country_enrich['infected␣
↪last_day'] / df_country_enrich['PopTotal']
df_country = df_country_enrich
```

[29]:
```
df_country.sort_values(by='infected last_day', ascending=False).head(10)
```

[29]:

	Country/Region	infected last_day	PopTotal	Infected/Million
136	India	64553	1380004385	46.777388
29	Brazil	60091	212559409	282.702141
225	United States of America	51443	331002647	155.415676
86	Colombia	11286	50882884	221.803465
189	Peru	8875	32971845	269.169044
212	Spain	7550	46754782	161.480809
6	Argentina	7498	45195777	165.900456
165	Mexico	7371	128932753	57.169337
210	South Africa	3946	59308690	66.533252
138	Iraq	3841	40222503	95.493809

[ ]:
```

```

[30]:
```
#df_country['Country/Region'].unique()
```

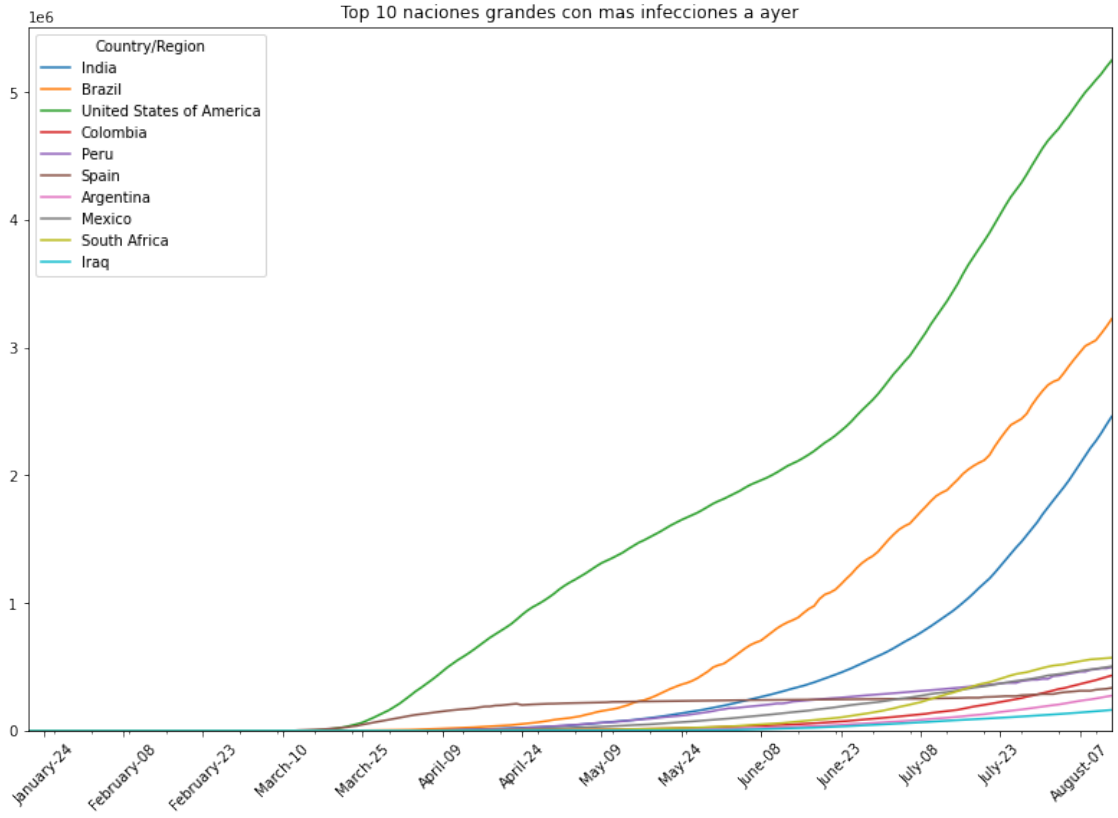
[19]:
```
#populations['Country/Region'].unique()
```

[31]:
```
from datetime import datetime, timedelta
import seaborn as sns
from matplotlib import pyplot as plt
```

```
import matplotlib.dates as mdates


def pintar_grafico(df, array_naciones_pintar ,title):
    df = df.T
    df = df.iloc[1:]
    new_header = df.iloc[0] #grab the first row for the header
    df = df[1:] #take the data less the header row
    df.columns = new_header #set the header row as the df header
    df = df.iloc[2:]
    df.index = pd.to_datetime(df.index)
    df = df[array_naciones_pintar]
    chart_df = df

    pd.plotting.register_matplotlib_converters()
    chart_df.plot(legend=True,figsize=(13.5,9))

    plt.gca().xaxis.set_major_formatter(mdates.DateFormatter('%B-%d'))
    plt.gca().xaxis.set_major_locator(mdates.DayLocator(interval=15))
    plt.xticks(rotation=45)

    ax = plt.gca()

    ax.set_title(title)
    ax.set_ylim(ymin=0)

    plt.show()

    df.tail(30).style.format ({ c : "{:20,.0f}" for c in df.columns }).
 ↪background_gradient(cmap='Wistia', )
    return plt
```

[32]:
```
title="Top 10 naciones grandes con mas infecciones a ayer"
display(HTML(f"""<h1 id='{title}'>{title}</h1>"""))

naciones_pintar = df_country.sort_values(by='infected last_day',␣
 ↪ascending=False).head(10)['Country/Region'].values
df_country.sort_values(by='infected last_day', ascending=False).head(10)

pintar_grafico(df,naciones_pintar,title)
```

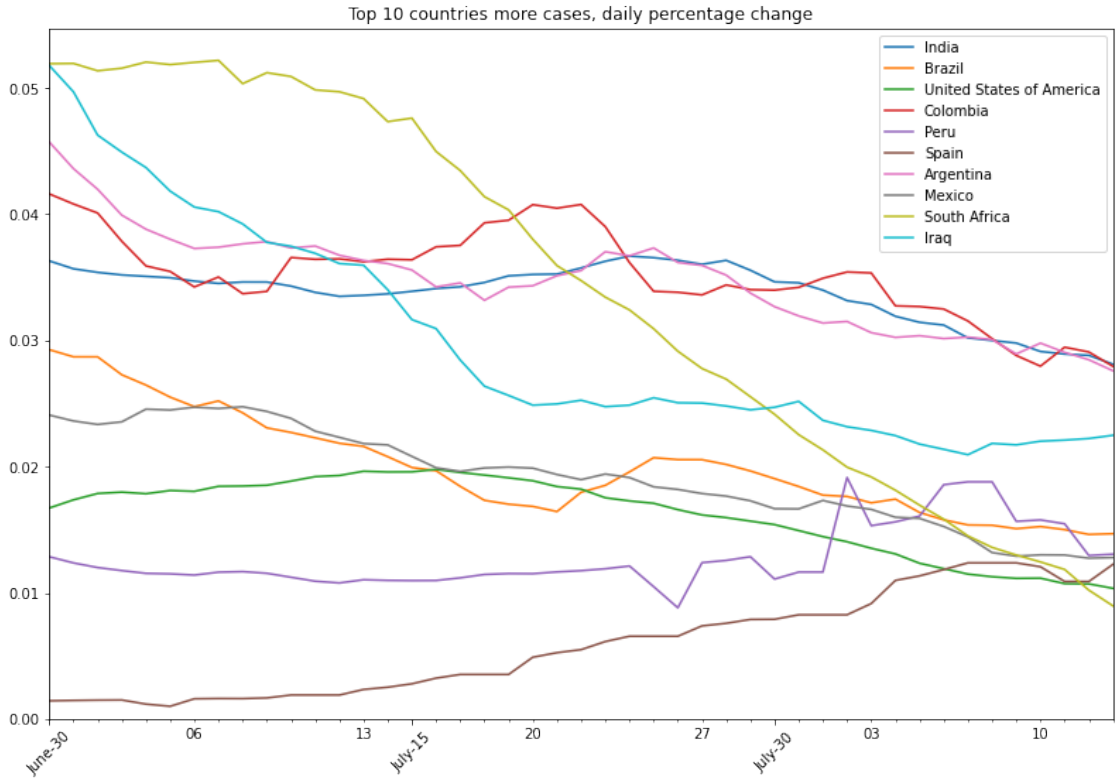
```
<IPython.core.display.HTML object>
```



[32]:
```
<module 'matplotlib.pyplot' from
'/root/anaconda2/envs/jupyter/lib/python3.6/site-packages/matplotlib/pyplot.py'>
```

[45]:
```
def pintar_grafico_daily(df, array_naciones_pintar ,title):
    df = df.T
    df = df.iloc[1:]
    new_header = df.iloc[0] #grab the first row for the header
    df = df[1:] #take the data less the header row
    df.columns = new_header #set the header row as the df header
    df = df.iloc[2:]
    df.index = pd.to_datetime(df.index)
    df = df[array_naciones_pintar]
    chart_df = df

    pd.plotting.register_matplotlib_converters()

    df_daily_increments = pd.DataFrame()
    for country in chart_df.columns:
        df_daily_increments[country] = chart_df[country].pct_change().
↪rolling(window=7).mean()
```

```
    df_daily_increments

    chart_df = df_daily_increments
    chart_df.tail(45).plot(legend=True,figsize=(13.5,9))

    plt.gca().xaxis.set_major_formatter(mdates.DateFormatter('%B-%d'))
    plt.gca().xaxis.set_major_locator(mdates.DayLocator(interval=15))
    plt.xticks(rotation=45)

    ax = plt.gca()

    ax.set_title(title)
    ax.set_ylim(ymin=0)

    plt.show()

    chart_df.tail(30).style.format ({ c : "{:20,.2f}" for c in df.columns }).
↪background_gradient(cmap='Wistia', )


    return chart_df

pintar_grafico_daily(df,naciones_pintar,"Top 10 countries more cases, daily␣
↪percentage change")
```



[45]:

	India	Brazil	United States of America	Colombia	Peru	\
2020-01-22	NaN	NaN	NaN	NaN	NaN	
2020-01-23	NaN	NaN	NaN	NaN	NaN	
2020-01-24	NaN	NaN	NaN	NaN	NaN	
2020-01-25	NaN	NaN	NaN	NaN	NaN	
2020-01-26	NaN	NaN	NaN	NaN	NaN	
…	…	…	…	…	…	
2020-08-09	0.029785	0.015084	0.011148	0.028803	0.015665	
2020-08-10	0.029120	0.015252	0.011163	0.027955	0.015776	
2020-08-11	0.028916	0.015009	0.010731	0.029458	0.015472	
2020-08-12	0.028811	0.014629	0.010712	0.029080	0.012960	
2020-08-13	0.028112	0.014686	0.010358	0.027938	0.013065	

	Spain	Argentina	Mexico	South Africa	Iraq
2020-01-22	NaN	NaN	NaN	NaN	NaN
2020-01-23	NaN	NaN	NaN	NaN	NaN
2020-01-24	NaN	NaN	NaN	NaN	NaN
2020-01-25	NaN	NaN	NaN	NaN	NaN
2020-01-26	NaN	NaN	NaN	NaN	NaN
…	…	…	…	…	…
2020-08-09	0.012376	0.028923	0.012907	0.012997	0.021723
2020-08-10	0.012067	0.029780	0.013009	0.012449	0.022013
2020-08-11	0.010904	0.029051	0.012996	0.011854	0.022099
2020-08-12	0.010898	0.028465	0.012747	0.010217	0.022225
2020-08-13	0.012259	0.027590	0.012795	0.008969	0.022481

[205 rows x 10 columns]

[43]:
```
country='India'
df_daily_increments = pd.DataFrame()
for country in chart_df.columns:
    df_daily_increments[country] = chart_df[country].pct_change().
 ↪rolling(window=7).mean()

df_daily_increments
```

[43]:

	India	Brazil	United States of America	Colombia	Peru	\
2020-01-22	NaN	NaN	NaN	NaN	NaN	
2020-01-23	NaN	NaN	NaN	NaN	NaN	
2020-01-24	NaN	NaN	NaN	NaN	NaN	
2020-01-25	NaN	NaN	NaN	NaN	NaN	
2020-01-26	NaN	NaN	NaN	NaN	NaN	
…	…	…	…	…	…	
2020-08-09	0.029785	0.015084	0.011148	0.028803	0.015665	
2020-08-10	0.029120	0.015252	0.011163	0.027955	0.015776	

```
2020-08-11  0.028916  0.015009                  0.010731  0.029458  0.015472
2020-08-12  0.028811  0.014629                  0.010712  0.029080  0.012960
2020-08-13  0.028112  0.014686                  0.010358  0.027938  0.013065

               Spain  Argentina    Mexico  South Africa      Iraq
2020-01-22       NaN        NaN       NaN           NaN       NaN
2020-01-23       NaN        NaN       NaN           NaN       NaN
2020-01-24       NaN        NaN       NaN           NaN       NaN
2020-01-25       NaN        NaN       NaN           NaN       NaN
2020-01-26       NaN        NaN       NaN           NaN       NaN
…                …          …         …             …         …
2020-08-09  0.012376   0.028923  0.012907      0.012997  0.021723
2020-08-10  0.012067   0.029780  0.013009      0.012449  0.022013
2020-08-11  0.010904   0.029051  0.012996      0.011854  0.022099
2020-08-12  0.010898   0.028465  0.012747      0.010217  0.022225
2020-08-13  0.012259   0.027590  0.012795      0.008969  0.022481

[205 rows x 10 columns]
```

[12]:
```
#title="Top 10 naciones grandes con mas infeccionesa ayer en infectados/millon"
#display(HTML(f"""<h1 id='{title}'>{title}</h1>"""))

#naciones_pintar = df_country.filter_on("PopTotal > 25000000").
 ↪sort_values(by='Infected/Million', ascending=False).head(10)['Country/
 ↪Region'].values
#df_country.sort_values(by='infected last_day', ascending=False).head(10)

#pintar_grafico(df_country,naciones_pintar,title)
```

[ ]:
```

```