S (específico) :

Con el análisis de la base de datos de los tweets acerca del Covid 19, se desea visualizar el cambio en la actividad de los usuarios que publicaron sobre el tema.

M (medible) :

Esto se puede medir con la cantidad de likes que recibieron los tweets, con el número de tweets publicados por las cuentas con una multitud de seguidores y cuentas verificadas, los elementos comunes entre los tweets como hashtags, ubicación y palabras clave.

A (alcanzable) :

Es razonable obtener esta información mediante el uso de filtros, sumas y gráficas como histogramas, mapas de calor, nube de palabras y diagramas de caja.

R (relevante) :

Es importante ver estos datos a través de estas herramientas analíticas pues ayuda a comprender el comportamiento de las personas en las redes sociales ante un tema relevante.

T (en un marco de tiempo) :

Este análisis debe realizarse durante el día destinado para la realización del reto, usando las herramientas aprendidas en los últimos 4 días.

In [1]:
```python
# Importamos librerías necesarías para la solución
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
from collections import Counter
import plotly.express as px

# Asignamos el documento csv a un dataframe llamadado 'datos'
datos = pd.read_csv("covid19_tweets.csv")
```

In [2]:
```python
resaltado = sns.light_palette("green", as_cmap = True)
mapear = datos.head(10).style.background_gradient(cmap=resaltado)
mapear
```

Out[2]:

	user_name	user_location	user_description	user_created	user_followers	user_friends	user_favourites	user_v
0	ᖽᐸi☻⌊₵✝	astroworld	wednesday addams as a disney princess keepin it ⟦(ιoo̲)⟧ 👸🏻💜♊🧀🌵🏙🌙	2017-05-26 05:46:42	624	950	18775	
1	Tom Basile us	New York, NY	Husband, Father, Columnist & Commentator. Author of Tough Sell: Fighting the Media War in Iraq. Bush Admin Alum. Newsmax Contributor. Fmr Exec Dir NYSGOP	2009-04-16 20:06:23	2253	1677	24	
2	Time4fisticuffs	Pewee Valley,	#Christian	2009-02-28	9275	9525	7254	

		KY	#Catholic #Conservative #Reagan #Republican #Capitalist; Sports lover - #BBN #Cincinnati #Reds #Bengals #Trump2020	18:57:41			
3	ethel mertz	Stuck in the Middle	#Browns #Indians #ClevelandProud #[]_[] #Cavs #Resist	2019-03-07 01:45:06	197	987	1488
4	DIPR-J&K	Jammu and Kashmir	Official Twitter handle of Department of Information and Public Relations, Govt of Jammu & Kashmir	2017-02-12 06:45:15	101009	168	101
5	Franz Schubert	Новоро́ссия	#Новоро́ссия #Novorossiya #оставайсядома #STAYatHOME Polymath, composer, English.	2018-03-19 16:29:52	1180	1071	1287
6	hr bartender	Gainesville, FL	Workplace tips and advice served up in a friendly place. Corporate blog of @ITMGroup by @Sharlyn_Lauby. Cheers!	2008-08-12 18:19:49	79956	54810	3801
7	Derbyshire LPC	nan	nan	2012-02-03 18:08:10	608	355	95
8	Prathamesh Bendre	nan	A poet, reiki practitioner and a student of law.	2015-04-25 08:15:41	25	29	18
9	Member of Christ cnusin idbrngbdru	location at link below	Just as the body is one & has many members, & all the members of the body, though many, are one body, so it is with Christ. 1 Corinthians 12:12	2014-08-17 04:53:22	55201	34239	29802

In [3]:
```
# Vemos la estadística básica de 'datos'
datos.describe()
```

Out[3]:

	user_followers	user_friends	user_favourites
count	7.443600e+04	74436.000000	7.443600e+04
mean	1.059513e+05	2154.721170	1.529747e+04
std	8.222900e+05	9365.587474	4.668971e+04
min	0.000000e+00	0.000000	0.000000e+00
25%	1.660000e+02	153.000000	2.200000e+02
50%	9.600000e+02	552.000000	1.927000e+03
75%	5.148000e+03	1780.250000	1.014800e+04
max	1.389284e+07	497363.000000	2.047197e+06

In [7]:
```
# Tipo de datos en cada columna
infoData = datos
infoData.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 74436 entries, 0 to 74435
Data columns (total 13 columns):
 #   Column            Non-Null Count  Dtype 
---  ------            --------------  ----- 
 0   user_name         74436 non-null  object
 1   user_location     59218 non-null  object
 2   user_description  70079 non-null  object
 3   user_created      74436 non-null  object
 4   user_followers    74436 non-null  int64 
 5   user_friends      74436 non-null  int64 
 6   user_favourites   74436 non-null  int64 
 7   user_verified     74436 non-null  bool  
 8   date              74436 non-null  object
 9   text              74436 non-null  object
 10  hashtags          53002 non-null  object
 11  source            74424 non-null  object
 12  is_retweet        74436 non-null  bool  
dtypes: bool(2), int64(3), object(8)
memory usage: 6.4+ MB
```

In [8]:
```
# Veamos los followers
# El usuario con mayor followers tiene 13, 892, 795 followers
# Creamos otro Dataframe de usuarios con al menos 11, 000, 000 seguidores
# lo organizamos de mayor a menor e imprimimos

followers_datos = datos[datos['user_followers'] > 11000000]
followers_datos.sort_values(by = ['user_followers'], ascending = False)
followers_datos[['user_name','user_followers']].head()
```

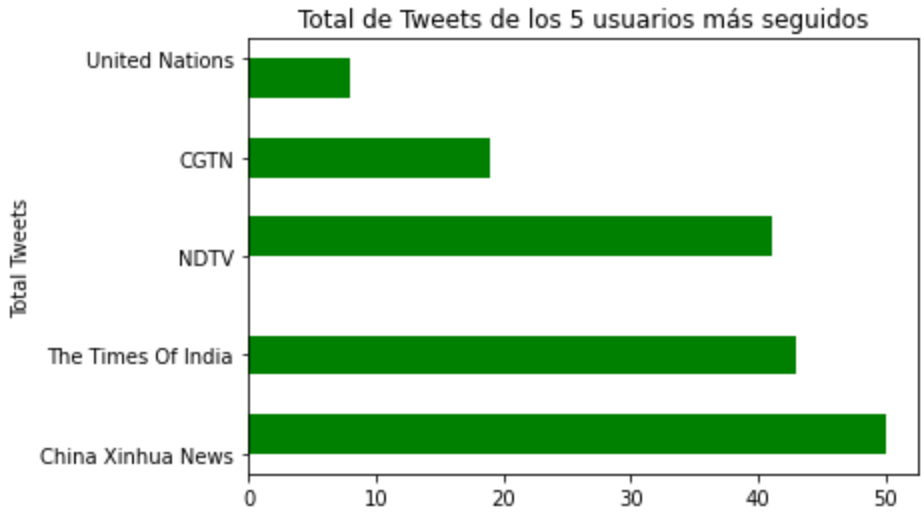
Out[8]:

	user_name	user_followers
235	CGTN	13892795
785	The Times Of India	12978547
1161	NDTV	13417047
1354	NDTV	13417047
2837	CGTN	13892793

In [9]:
```
# Obtenemos total de tweets de los usuarios con más followers
# Con la ayuda de Counter() y el dataframe followers_datos

cnt = Counter(followers_datos.user_name)
tot_tweets = []
for u, count in cnt.most_common(5):
    print ('%s: %7d' % (u, count))
    for val in range(count + 1):
        tot_tweets.append(u)
```

```
China Xinhua News:      49
The Times Of India:      42
NDTV:      40
CGTN:      18
United Nations:       7
```

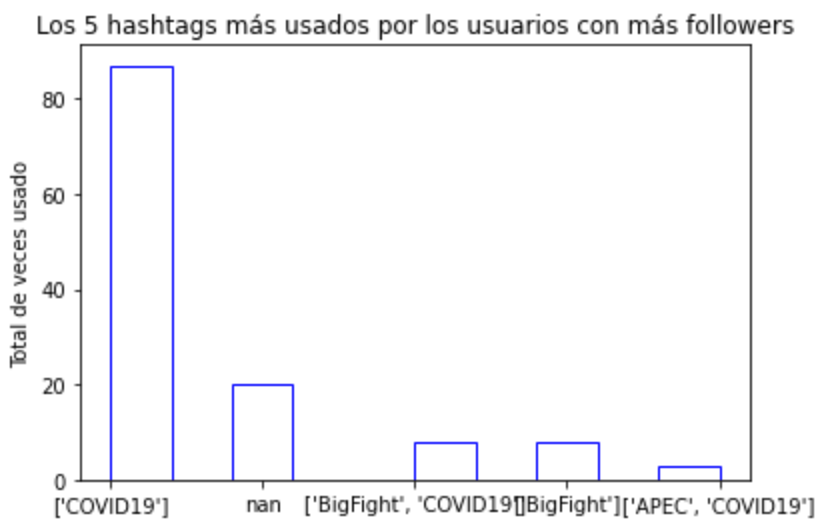
In [10]:
```
# Creamos un histograma donde se verá el total de tweets de los 5 usuarios
# con más followers
plt.hist(tot_tweets, color = 'green', orientation = 'horizontal')
plt.title('Total de Tweets de los 5 usuarios más seguidos')
plt.ylabel('Total Tweets')
plt.show()
```



In [11]:
```
# Counter para la sub dataframe que muestra los hashtags más comunes
cnt2 = Counter(followers_datos.hashtags)
tot_hashtags = []

for ht, count in cnt2.most_common(5):
    print ('%s: %7d' % (ht, count))
    for val in range(count + 1):
        tot_hashtags.append(ht)
```

```
['COVID19']:      86
nan:      19
['BigFight', 'COVID19']:       7
['BigFight']:       7
['APEC', 'COVID19']:       2
```

In [12]:
```
# mediante p¿matplotlib graficamos en histograma los hastags mas usados
plt.hist(tot_hashtags, color = 'blue', histtype = 'step')
plt.title('Los 5 hashtags más usados por los usuarios con más followers')
plt.ylabel('Total de veces usado')
plt.show()
```



In [13]:
```
# Obtenemos los tweets con más likes
# El tweet con más likes tiene 2,047,197
# Obtenemos dataframe que tengan likes mayores a 1, 100, 000

likes_datos = datos[datos['user_favourites'] > 1100000]
d1 = likes_datos.groupby(['user_name']).mean().sort_values(['user_favourites'], ascendin
dLikes = d1[['user_favourites']]
dLikes.head()
```

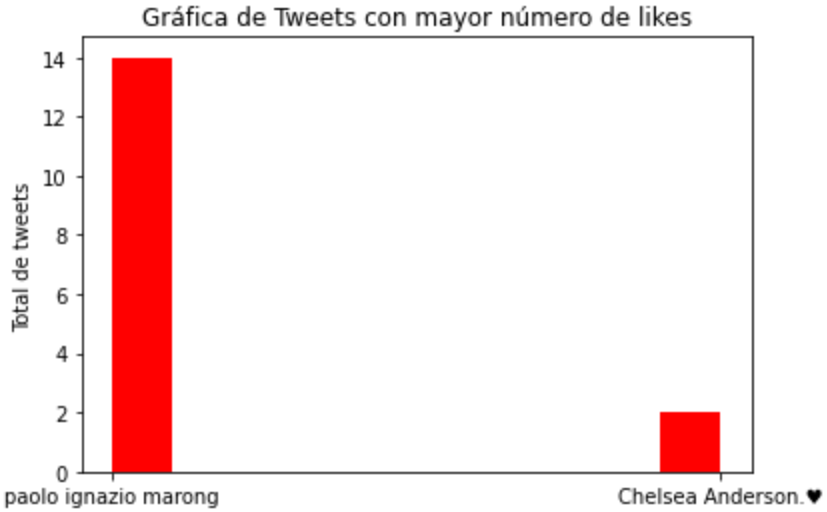
Out[13]:

user_name	user_favourites
Chelsea Anderson.♥	2047197.0
paolo ignazio marong	1153375.0

In [14]:
```
#
cnt3 = Counter(likes_datos.user_name)
tot3 = []

for u, count in cnt3.most_common(5):
    print ('%s: %7d' % (u, count))
    for val in range(count + 1):
        tot3.append(u)
```

```
paolo ignazio marong:      13
Chelsea Anderson.♥:       1
```

In [15]:
```
plt.hist(tot3, color = 'red')
plt.title('Gráfica de Tweets con mayor número de likes')
plt.ylabel('Total de tweets')
plt.show()
```



In [16]:
```
# Tweets con más favoritos

likes_datos = datos[datos['user_favourites'] > 1100000]
likes_datos.sort_values(by = ['user_favourites'], ascending = False)
likes_datos[['user_name','user_followers', 'text']].head()
```

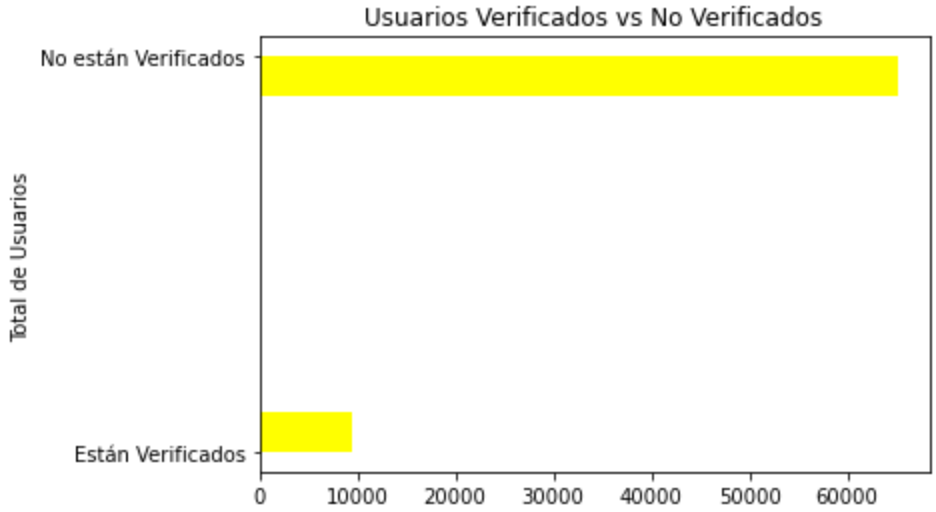
Out[16]:

	user_name	user_followers	text
14504	Chelsea Anderson.♥	22864	So Trump wants everyone else's child to get #C...
18269	paolo ignazio marong	87574	Numeri ridotti di #Covid19 ma da monitorare a ...
18306	paolo ignazio marong	87574	Il divertimento notturno nel mirino #covid19 #...
18744	paolo ignazio marong	87574	Di nuovo sotto 60 casi in #CoreadelSud #Covid1...
18865	paolo ignazio marong	87574	Numeri ancora ridotti ma mai così alti in #Aus...

In [17]:
```
# Vemos cuantos están verificados y cuantos no

cnt4 = Counter(datos.user_verified)

for u, count in cnt4.most_common(5):
    print ('%s: %7d' % (u, count))
```

```
False:   65082
True:    9354
```

In [18]:
```
tot4 = []
t = 9354
f = 65082

for val in range(t + 1):
    tot4.append("Están Verificados")
for val in range(f + 1):
    tot4.append("No están Verificados")

plt.hist(tot4, color = 'yellow', orientation = 'horizontal')
plt.title('Usuarios Verificados vs No Verificados')
plt.ylabel('Total de Usuarios')
plt.show()
```



In [19]:
```
# Verified usuarios

verificados_datos = datos[datos['user_verified'] == True]
verificados_datos[['user_name','text']].head()
```

Out[19]:

	user_name	text
1	Tom Basile us	Hey @Yankees @YankeesPR and @MLB - wouldn't it...
21	APO Group English	Coronavirus - South Africa: COVID-19 update fo...
25	Blood Donors India	#Kolar\nNeed #Blood Type : B-positive\nAt : J...
39	ASHP	We released two new #COVID19 podcast episodes ...
43	TOI Delhi	#Delhi reports 1,142 #COVID19 positive cases a...

In [20]:
```
# Los tweets mas likeados con usuarios verificados

verificados_likes_datos = verificados_datos[verificados_datos['user_favourites'] > 20000
verificados_likes_datos.sort_values(by = ['user_favourites'], ascending = False)
verificados_likes_datos[['user_name','user_favourites', 'text']].head()
```

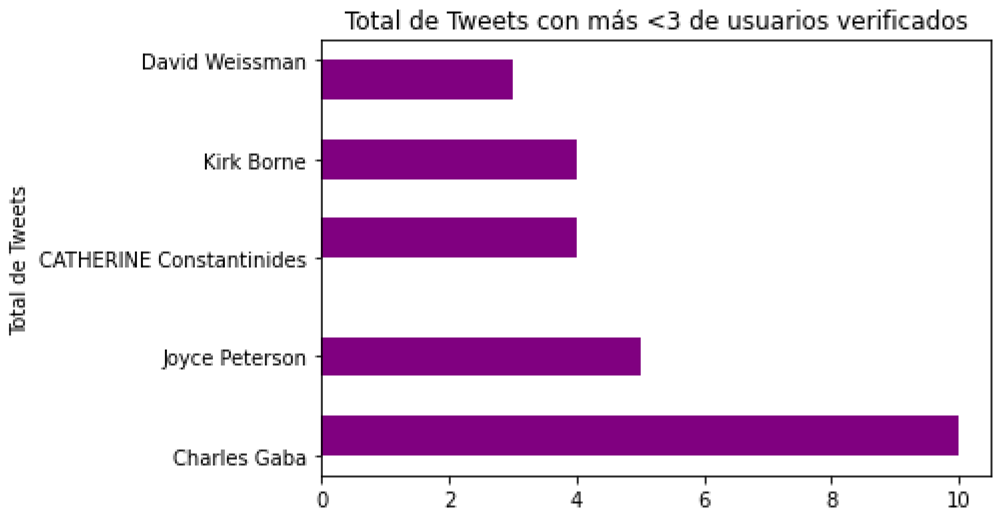
Out[20]:

	user_name	user_favourites	text
2514	Joyce Peterson	204655	FREE #COVID19 Drive-Thru Testing in DeSoto Cou...
3128	Holly Figueroa O'Reilly	200821	So, Sinclair is going to run that Qanon conspi...
12681	Joyce Peterson	204660	Walk with me. Dig the dance line on Beale Stre...
15997	Charles Gaba	567227	Welp. By Sunday night, not only will New York ...
16538	Carlos Gil	350900	I'm grateful for colleagues who recognize that...

In [21]:
```
cnt5 = Counter(verificados_likes_datos.user_name)
tot5 = []

for u, count in cnt5.most_common(5):
    print ('%s: %7d' % (u, count))
    for val in range(count+1):
        tot5.append(u)
```

```
Charles Gaba:       9
Joyce Peterson:       4
CATHERINE Constantinides:       3
Kirk Borne:       3
David Weissman:       2
```

In [22]:
```
plt.hist(tot5, color = 'purple', orientation = 'horizontal')
plt.title('Total de Tweets con más <3 de usuarios verificados')
plt.ylabel('Total de Tweets')
plt.show()
```



In [23]:
```
# Mjeros tweets con más likes pero con usuario no verificados

noVerificados_datos = datos[datos['user_verified'] == False]
noVerificados_datos[['user_name','text']].head()
```

Out[23]:

	user_name	text
0	ᖇᵒi☻⌊₵ꞇ	If I smelled the scent of hand sanitizers toda...
2	Time4fisticuffs	@diane3443 @wdunlap @realDonaldTrump Trump nev...
3	ethel mertz	@brookbanktv The one gift #COVID19 has give me...
4	DIPR-J&K	25 July : Media Bulletin on Novel #CoronaVirus...
5	🎹 Franz Schubert	#coronavirus #covid19 deaths continue to rise....

In [24]:
```
noVerificados_likes_datos = noVerificados_datos[noVerificados_datos['user_favourites'] >
noVerificados_likes_datos.sort_values(by = ['user_favourites'], ascending = False)
noVerificados_likes_datos[['user_name','user_favourites', 'text']].head()
```

Out[24]:

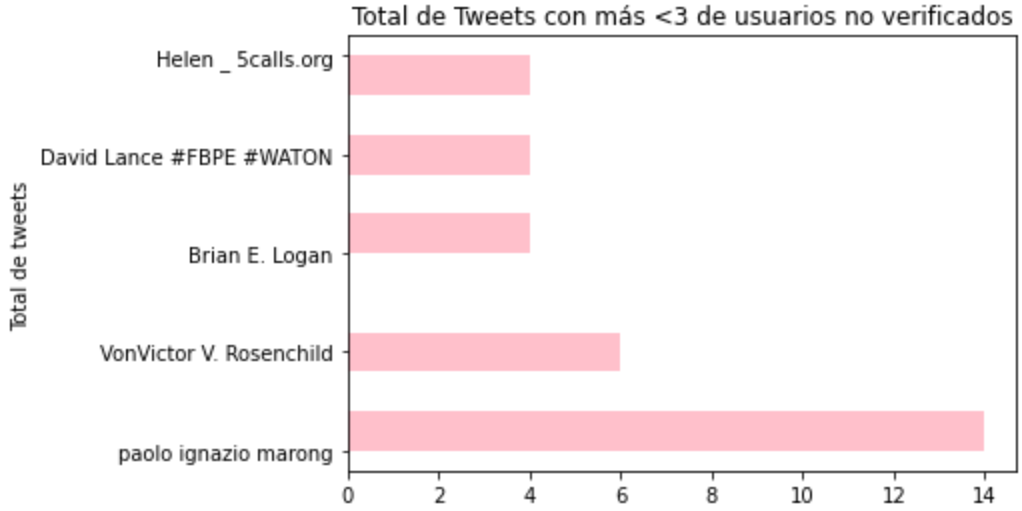
	user_name	user_favourites	text
7614	@Splashing Lights Photos	656341	@Angel_nookies_ Me neither. Wouldn't do it pos...
11946	@Splashing Lights Photos	656341	Sporting masks should be a nationwide mandate....
12668	James Jayi Wang	639931	86/ #COVID19 #coronavirus\nFRI JULY 24, 2020\n...
13099	Brian E. Logan	605134	@mick_inLa @MomofTwonodigit @NYPDnews @UPS @Le...
14504	Chelsea Anderson.♥	2047197	So Trump wants everyone else's child to get #C...

In [25]:
```
cnt6 = Counter(noVerificados_likes_datos.user_name)
tot6 = []

for u, count in cnt6.most_common(5):
    print ('%s: %7d' % (u, count))
    for val in range(count+1):
        tot6.append(u)
```

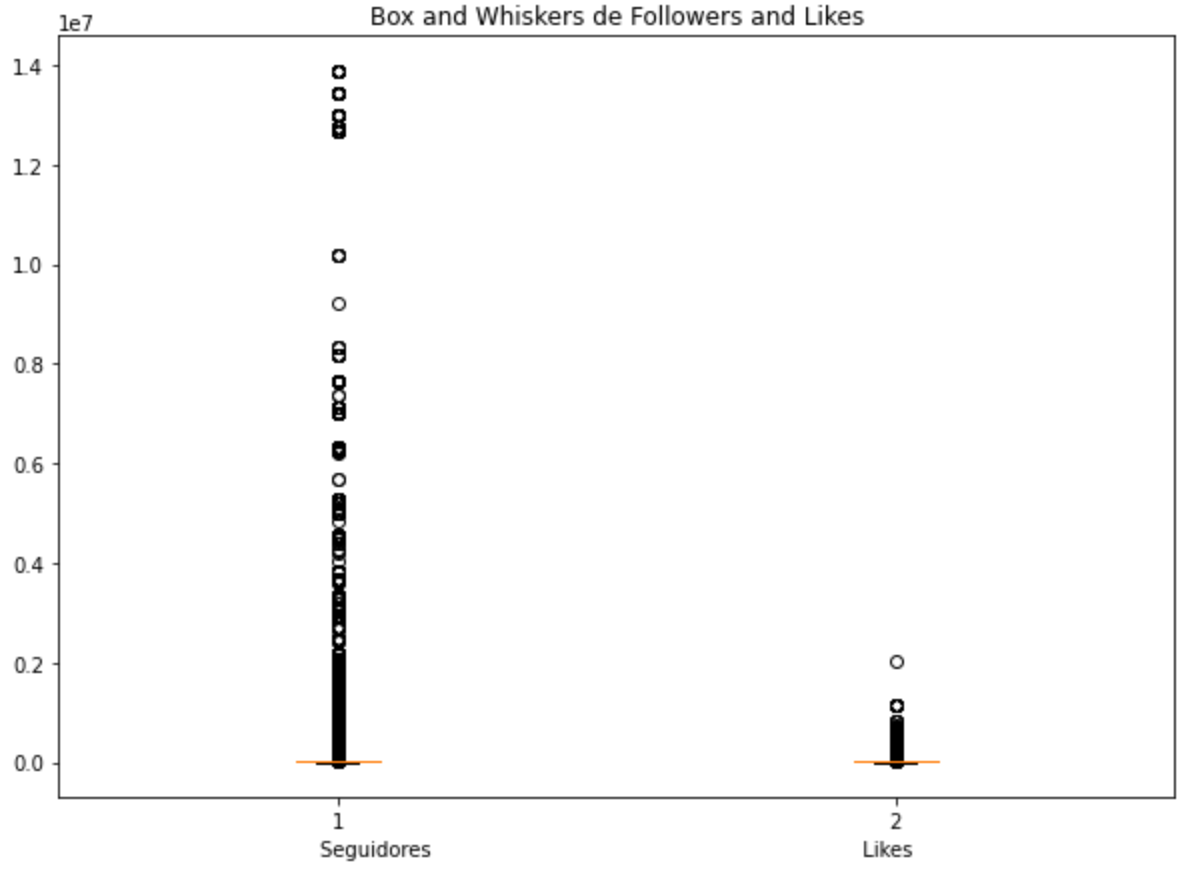
```
paolo ignazio marong:      13
VonVictor V. Rosenchild:        5
```

```
Brian E. Logan:       3
David Lance #FBPE #WATON:       3
Helen _ 5calls.org:       3
```

In [26]:
```
plt.hist(tot6, color = 'pink', orientation = 'horizontal')
plt.title('Total de Tweets con más <3 de usuarios no verificados')
plt.ylabel('Total de tweets')
plt.show()
```



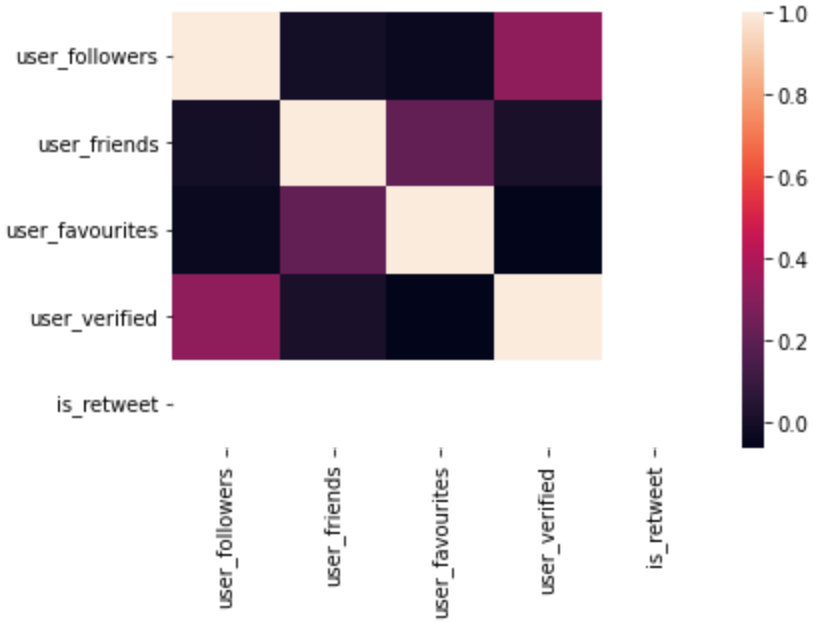
In [27]:
```
tot_followers = datos['user_followers']
tot_likes = datos['user_favourites']
vals = [tot_followers, tot_likes]

figura = plt.figure(figsize = (10, 7))
plt.boxplot(vals)
plt.title('Box and Whiskers de Followers and Likes',)
plt.xlabel('Seguidores
plt.show()
```




```
correlacionPearson = datos.corr(method ='pearson')
```

In [28]:
```
sns.heatmap(correlacionPearson, xticklabels = correlacionPearson.columns,
            yticklabels = correlacionPearson.columns)
```

Out[28]:
```
<AxesSubplot:>
```



In [29]:
```
# Tabla dinámica con índice source para determinar el tamaño de cada una
fuentes = datos.pivot_table(index = ['source'], aggfunc = 'size')
fuentes.sort_values(ascending = False)
```

Out[29]:
```
source
Twitter Web App                22974
Twitter for Android            16758
Twitter for iPhone             15824
TweetDeck                       3453
Hootsuite Inc.                  2846
                               ...
Dynamics 365 for Marketing         1
Konnect Social                     1
Downtime Monkey                    1
DopeyUncle2                        1
Fenix for Android                  1
Length: 450, dtype: int64
```

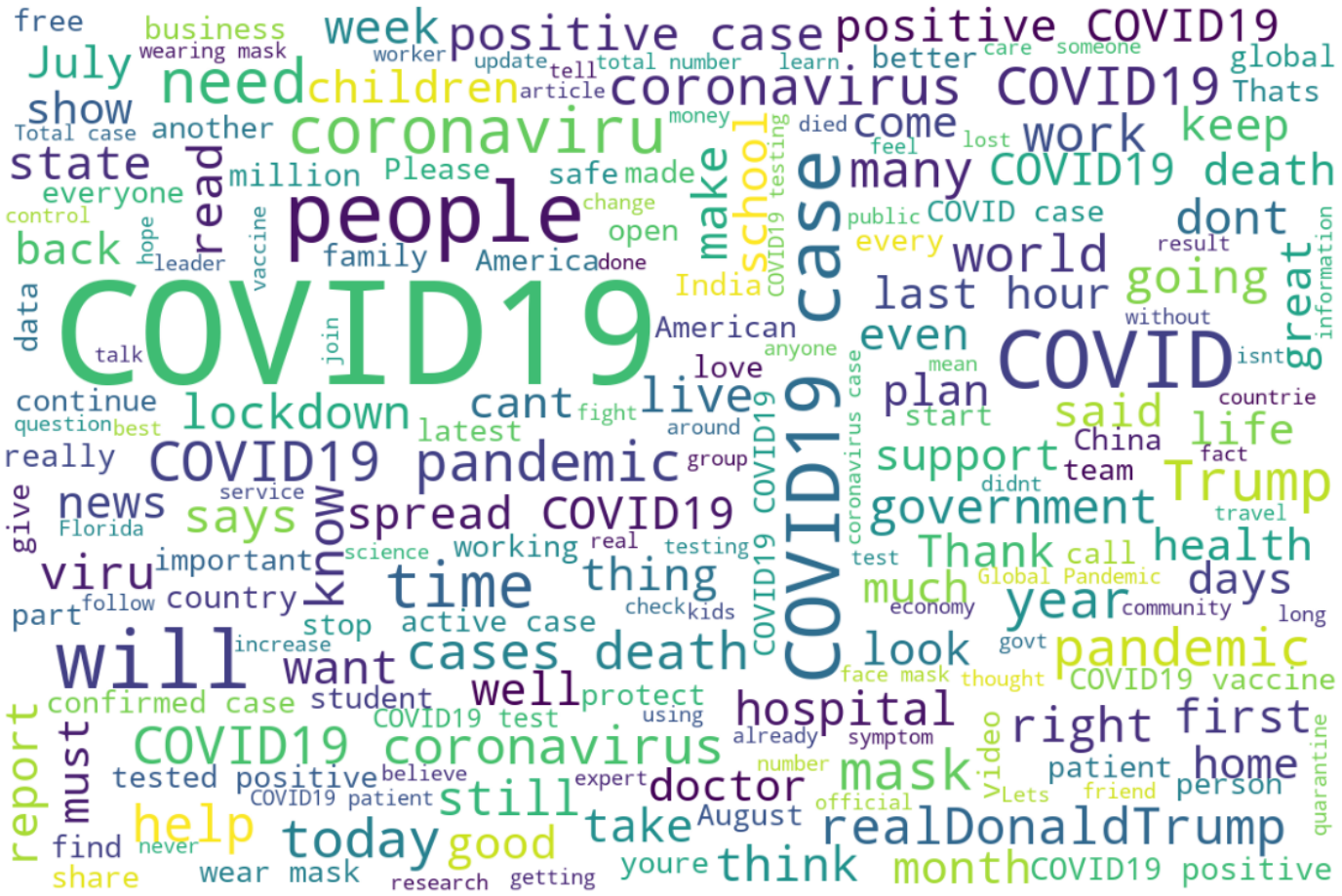
In [30]:
```
# Ubicar las 5 ubicaciones más repetidas
ubicaciones_datos = pd.DataFrame(datos)
ubicaciones = ubicaciones_datos['user_location'].value_counts()
ubicaciones[0:5]
```

Out[30]:
```
India               1496
United States       1172
New Delhi, India     669
Washington, DC       589
Mumbai, India        554
Name: user_location, dtype: int64
```

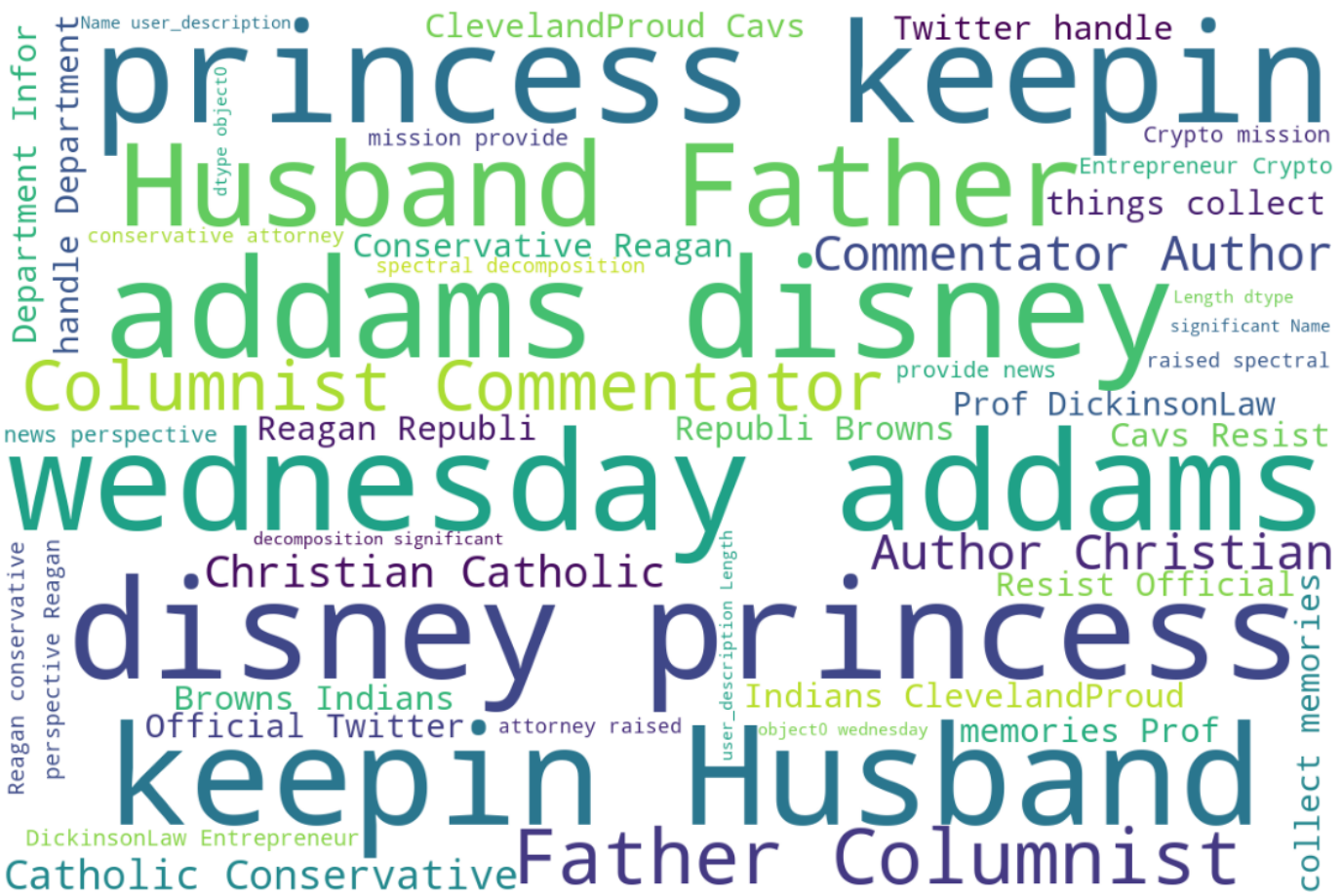
In [31]:
```
from wordcloud import WordCloud
import re

def text_cleaner(text) :
    #text = re. sub(' (It'text)
    text=re.sub(r"\n"," ",str(text))
    text=re.sub(r"\t"," ",str(text))
    text=re.sub(r"\r"," ",str(text))
    text=re.sub(r"(@)|(#)|(RT[\s]+)|(https?\/\/\S+)|([^a-zA-Z0-9 -])", "",str(text))
    text=text.strip(" ")
```

```
    return text

#dat= text_cleaner(datos)

def wordcloud(df, feature):
    wordcloud = WordCloud(width = 1200,
                          height = 800,
                          max_words = 200,
                          min_word_length = 4,
                          max_font_size = 130, min_font_size = 15,
                          background_color ='white').generate("".join(df[feature]))
    plt.figure(figsize = (20,15))
    plt.imshow(wordcloud)
    plt.axis('off')

datos['text'] = datos['text'].apply(text_cleaner)
datos['user_description'] = datos['user_description'].apply(text_cleaner)
datos['user_location'] = datos['user_location'].apply(text_cleaner)
datos['hashtags'] = datos['hashtags'].apply(text_cleaner)
```

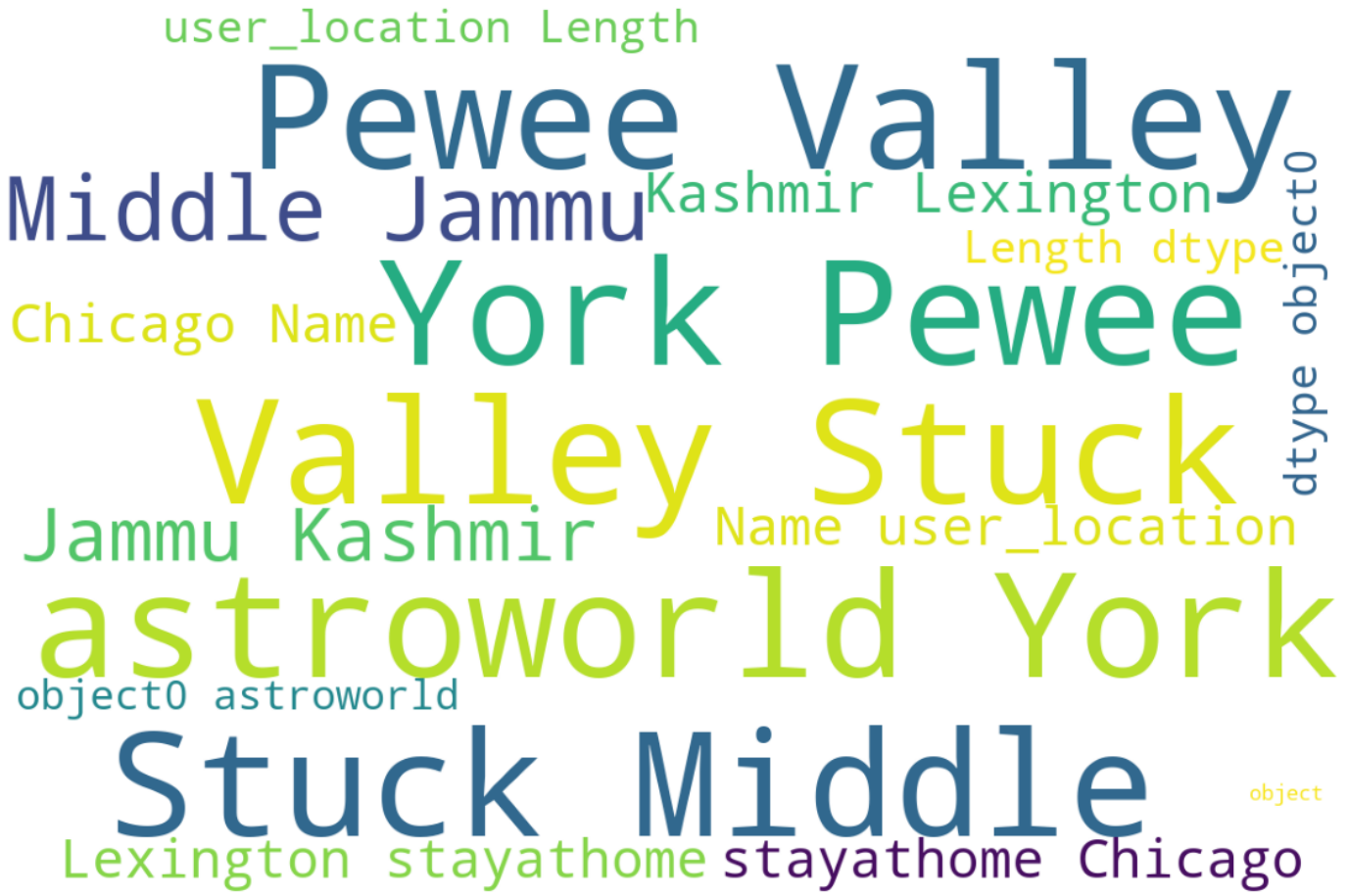
In [32]:
```
#tweets
wordcloud(datos, 'text')
```



In [33]:
```
#descripcion
datos['user_description'] = repr(datos['user_description'])
wordcloud(datos,'user_description')
```

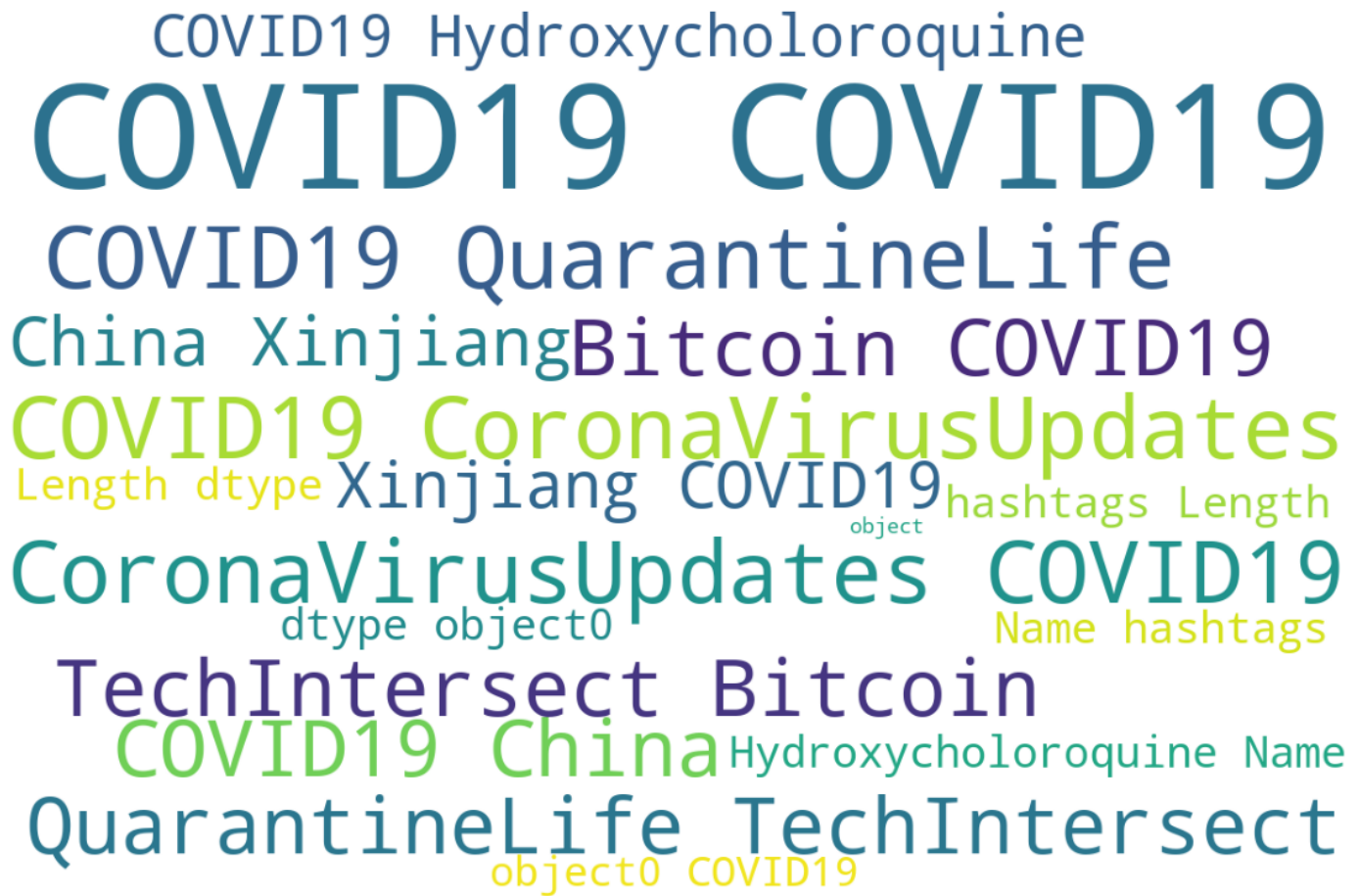


In [34]:
```
#location
datos['user_location'] = repr(datos['user_location'])
wordcloud(datos,'user_location')
```



In [35]:
```
#hashtags
```

```
datos['hashtags'] = repr(datos['hashtags'])
wordcloud(datos,'hashtags')
```



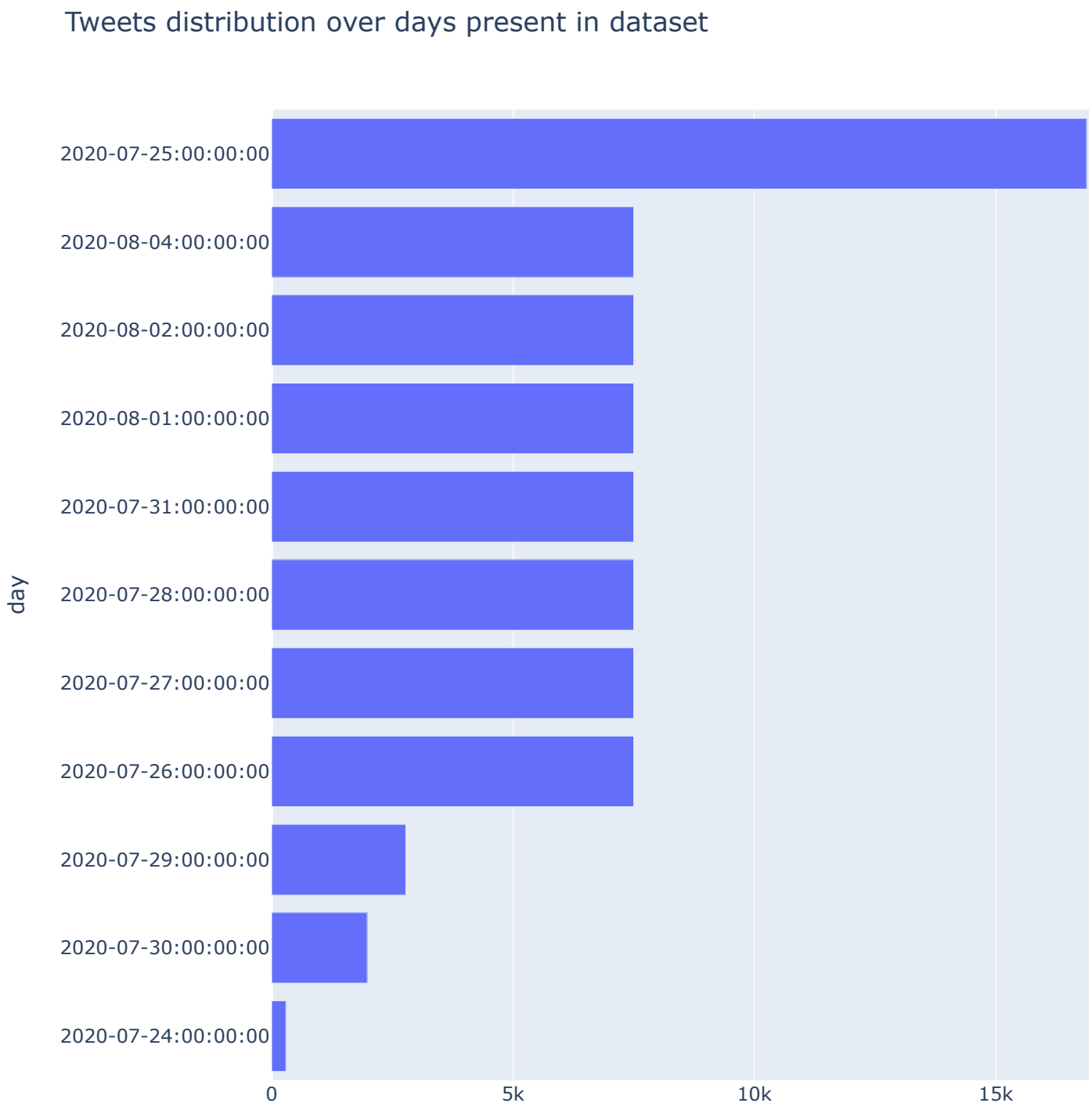
In [37]:
```
datos = pd.read_csv("covid19_tweets.csv")
datos['date'] = pd.to_datetime(datos['date'])
datos = datos.sort_values(['date'])
datos['day'] = datos['date'].astype(str).str.split(' ', expand=True)[0]
datos['time'] = datos['date'].astype(str).str.split(' ', expand=True)[1]
datos.head()
```

Out[37]:

	user_name	user_location	user_description	user_created	user_followers	user_friends	user_favourites	us
17175	Jessica Luther Rummel	Denton, Texas	Mother. Partner. Scholar. Activist. Alchemist....	2020-07-05 03:28:16	234	28	220	
17174	Dr. Lipi #TrustDrFauci Roy	New York, USA	@NBCNews @MSNBC @Forbes Medical Contributor | ...	2009-10-11 18:46:51	12485	4603	38120	
17173	Patty Hayes	Seattle, WA	Director of Public Health - Seattle & King Cou...	2017-07-07 18:56:50	718	162	2276	
17172	Clive Gorman	Victoria, British Columbia	Marketing Director @CNEGames for @idlechampion...	2011-12-23 02:02:35	597	224	23824	
17171	Tristyn Russelo	Alberta, Canada	NaN	2017-06-14 22:01:54	5	68	57	

In [38]:

```
fechas = datos['day'].value_counts().reset_index()
fechas.columns = ['day', 'count']
fechas = fechas.sort_values('count')

fechas['day'] = fechas['day'].astype(str) + ':00:00:00'

fig = px.bar(
    fechas,
    x='count',
    y="day",
    orientation='h',
    title='Tweets distribution over days present in dataset',
    width=800,
    height=800
)
fig.show()
#Comentario
```



count

Fin?

In [ ]: