Table and graphics from Google Analytics public dataset

In [ ]:

```
import os
import pandas as pd
from google.cloud import bigquery
import matplotlib.pyplot as plt


json_path = "/content/content/analytics/big-query-284408-e895d0eb5b23.json"
os.environ["GOOGLE_APPLICATION_CREDENTIALS"]=json_path

client = bigquery.Client()          # Start the BigQuery Client
# Input your Query Syntax here; You may try it first at https://console.cloud.google.com/
bigquery
sql = """SELECT *
              FROM `bigquery-public-data.google_analytics_sample.ga_sessions_20170801`
              LIMIT 1"""

# I am using low limits, because I have some limits in Google Big Query
df = client.query(sql).to_dataframe()
df.head()

# Explore data
```

Out[ ]:

	visitorId	visitNumber	visitId	visitStartTime	date	totals	trafficSource	device	geoNetwork
0	None	1	1501583974	1501583974	20170801	{'visits': 1, 'hits': 1, 'pageviews': 1, 'time...	{'referralPath': None, 'campaign': '(not set)'...	{'browser': 'Chrome', 'browserVersion': 'not a...	{'continent': 'Americas', 'subContinent': 'Car...

Date, channel, visits, transactions, transaction revenue

In [ ]:

```
# query by BigQuery Google Analytics tutorial
sql = """SELECT
                    date,
                    channelGrouping as channel,
                    totals.visits,
                    totals.transactions,
                    totals.transactionRevenue
                    FROM `bigquery-public-data.google_analytics_sample.ga_sessions_20170
801`
                    LIMIT 5"""

def get_data(sql):
  df = client.query(sql).to_dataframe()
  df['date'] = pd.to_datetime(df.date).dt.strftime('%Y-%m--%d')
  return df

df = get_data(sql)
df.head()
```

Out[ ]:

	date	channel	visits	transactions	transactionRevenue
0	2017-08--01	Organic Search	1	None	None
1	2017-08--01	Organic Search	1	None	None
2	2017-08--01	Organic Search	1	None	None

	date	channel	visits	transactions	transactionRevenue
3	2017-08--01	Direct	1	None	None
4	2017-08--01	Organic Search	1	None	None

Select date, channel, visits, transactions and transaction revenue - first 100 results

Direct visitors and organic search data: ordered by transaction revenue

In [ ]:

```
sql ="""SELECT
                        date,
                        channelGrouping as channel,
                        totals.visits,
                        totals.transactions,
                        totals.transactionRevenue
                        FROM `bigquery-public-data.google_analytics_sample.ga_sessions_201
70801`
                        WHERE channelGrouping in ('Direct', 'Organic Search')
                        ORDER BY totals.transactionRevenue desc LIMIT 5"""

df = get_data(sql)
df.head()
```

Out[ ]:

	date	channel	visits	transactions	transactionRevenue
0	2017-08--01	Direct	1	1	1000780000
1	2017-08--01	Direct	1	1	982730000
2	2017-08--01	Organic Search	1	1	400210000
3	2017-08--01	Direct	1	1	347140000
4	2017-08--01	Organic Search	1	1	169900000

Aggregate transaction totals

In [ ]:

```
# query by BigQuery Google Analytics tutorial
query_organic_direct = """SELECT date, channelGrouping as channel,
                                        sum(totals.visits) as visits,
                                        CASE WHEN sum(totals.visits) > 0 THEN sum(tota
ls.transactions) / sum(totals.visits)
                                        ELSE 0 END as conv_rate,
                                        sum(totals.transactions) as transactions,
                                        CASE WHEN sum(totals.transactions) > 0 THEN
                                        sum(totals.transactionRevenue) / sum(totals.tr
ansactions)
                                        ELSE 0 END as aov,
                                        sum(totals.transactionRevenue) as revenue
                                        FROM `bigquery-public-data.google_analytics_sa
mple.ga_sessions_20170801`
                                        WHERE channelGrouping in ('Organic Search', 'D
irect')
                                        GROUP BY date, channel
                                        ORDER BY transactions
                                        desc LIMIT 1000"""

df = get_data(sql)
df.head()
```

Out[ ]:

	date	channel	visits	transactions	transactionRevenue
0	2017-08--01	Direct	1	1	1000780000

	date	channel	visits	transactions	transactionRevenue
1	2017-08--01	Direct	1	1	982730000
2	2017-08--01	Organic Search	1	1	400210000
3	2017-08--01	Direct	1	1	347140000
4	2017-08--01	Organic Search	1	1	169900000

all channels

In [ ]:

```
%matplotlib inline
```

In [ ]:

```
%%bigquery
# this gives option to run BigQuery statements directly in Jupyter

SELECT distinct(channelGrouping)
FROM `bigquery-public-data.google_analytics_sample.ga_sessions_20170801`

LIMIT 10
```

Out[ ]:

	channelGrouping
0	Organic Search
1	Direct
2	Referral
3	Paid Search
4	Display
5	Affiliates
6	Social

Number of visitors per date, by channel - Organic Search and Paid Search

In [ ]:

```
sql = """SELECT distinct(date), channelGrouping as channel, count(totals.visits) as visit
ors_num,
FROM `bigquery-public-data.google_analytics_sample.ga_sessions_*`
WHERE channelGrouping like '%Search'
GROUP BY date, channel
ORDER BY date
LIMIT 20 """

df = get_data(sql)
df.head()
```

Out[ ]:

	date	channel	visitors_num
0	2016-08--01	Organic Search	362
1	2016-08--01	Paid Search	25
2	2016-08--02	Paid Search	48
3	2016-08--02	Organic Search	663
4	2016-08--03	Paid Search	63

Number of visitors by date (paid/ organic search) in different color schemas

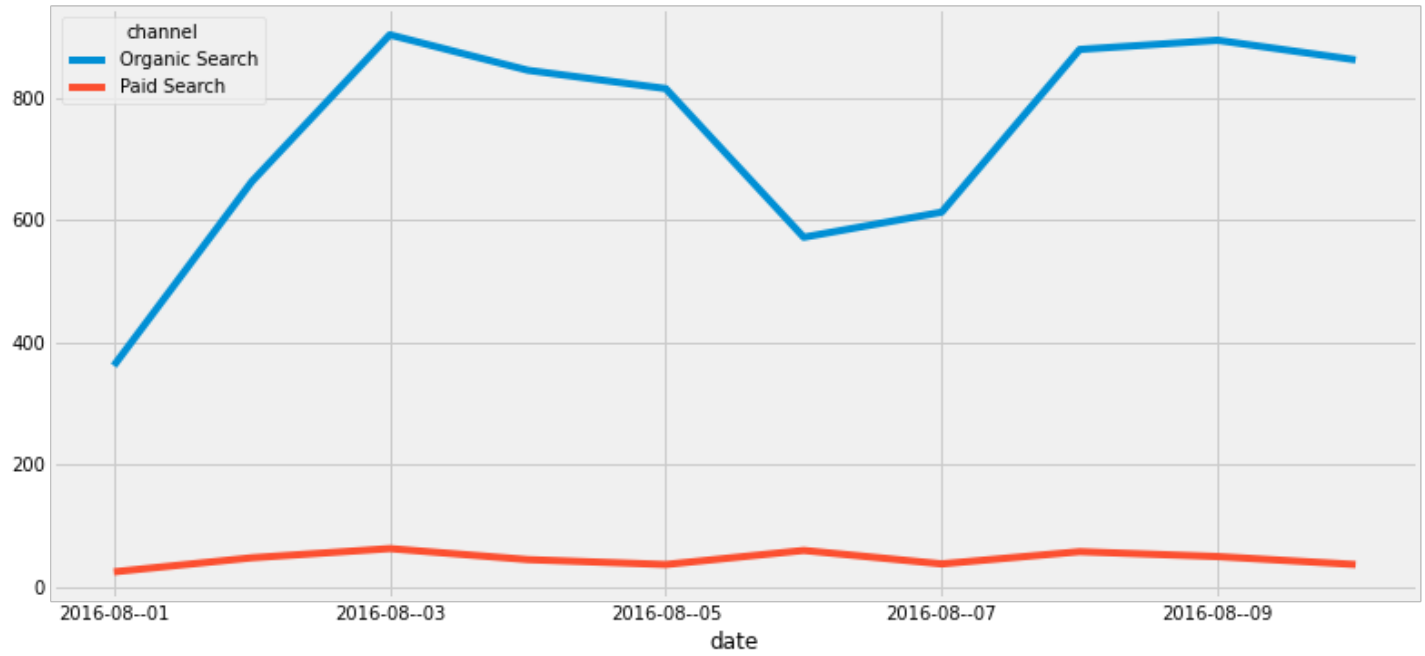
In [ ]:

In [ ]:

```
df_line = df
df_plot = df_line.pivot('date', 'channel', 'visitors_num')
df_plot.plot(figsize=(12, 6));
ax.set_title("Visitors per day from Search channels")
ax.set_xlabel("Date")
ax.set_ylabel("Visitors")
```

Out[ ]:

```
Text(20.200000000000003, 0.5, 'Visitors')
```



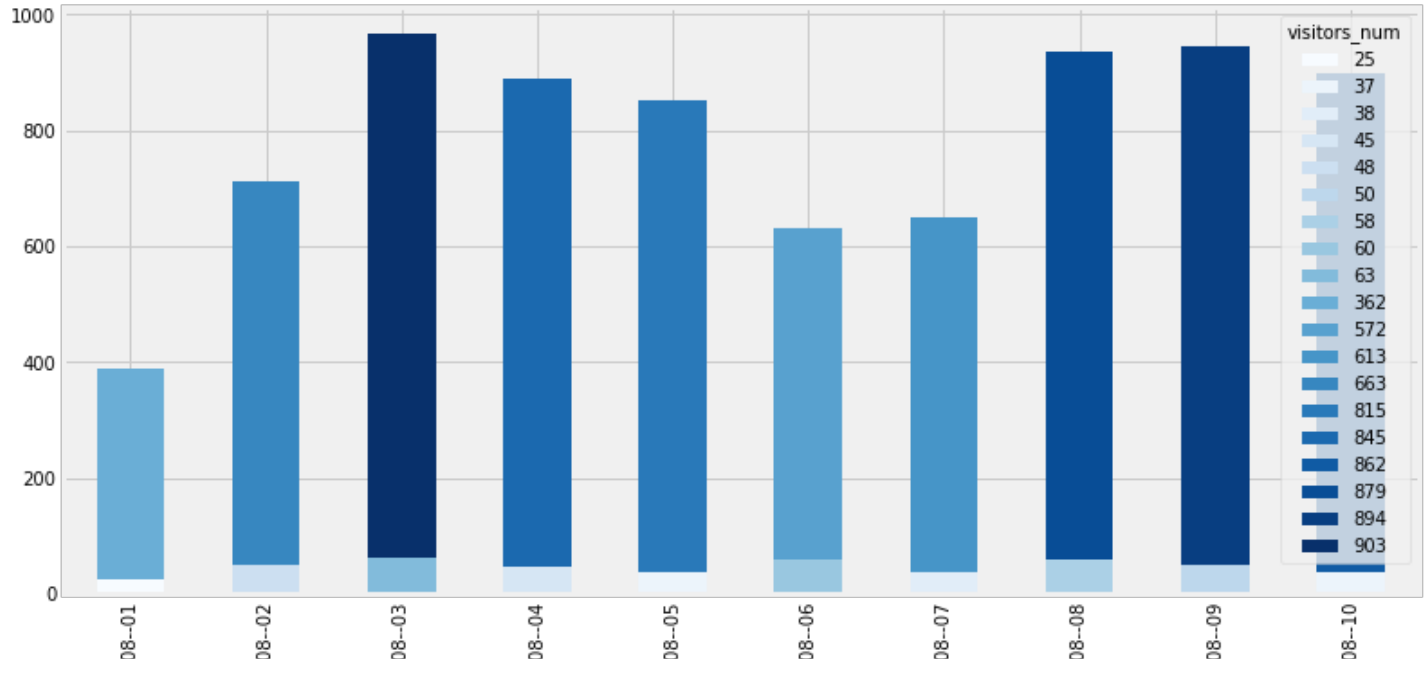
Paid search and Organic search

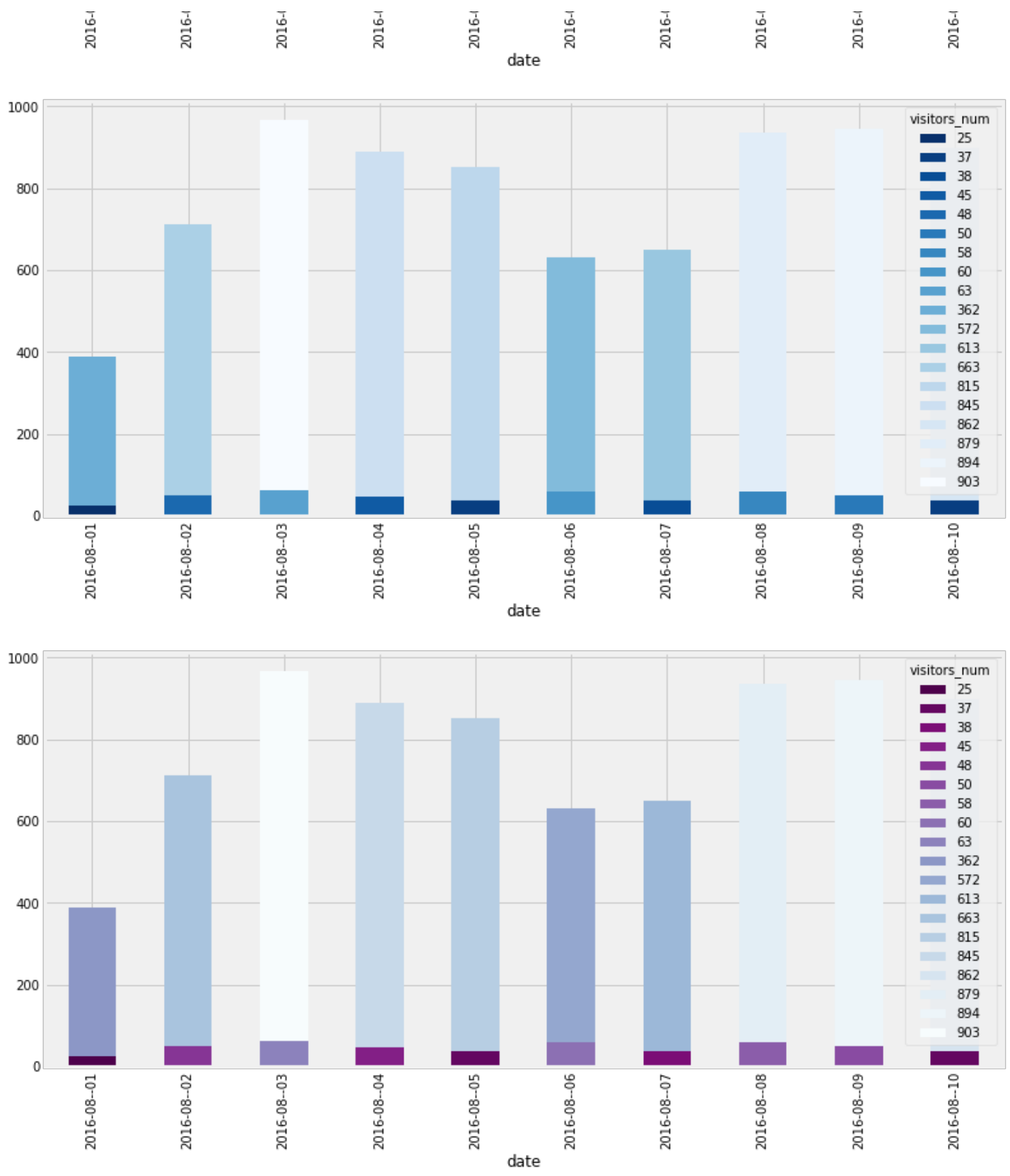
In [ ]:

```
pivot_table = df.pivot(index="date", columns="visitors_num", values="visitors_num")
bar_list = [ 'Blues', 'Blues_r', 'BuPu_r'] # list of styles for graphics
for n, i in enumerate(bar_list):
  pivot_table.plot(kind="bar", stacked=True, colormap=bar_list[n], figsize=(12,6))
ax.set_title("Visitors per day from Search channels")
ax.set_xlabel("Date")
ax.set_ylabel("Visitors")
```

Out[ ]:

```
Text(20.200000000000003, 0.5, 'Visitors')
```





Visitors per day from All channels

In [ ]:

```
sql = """SELECT distinct(date), count(totals.visits) as visitors_num,
FROM `bigquery-public-data.google_analytics_sample.ga_sessions_*`
GROUP BY date
ORDER BY date
LIMIT 20 """

df = get_data(sql)
df.head()
```

Out[ ]:

	date	visitors_num

	date	visitors_num
0	2016-08--01	1711
1	2016-08--02	2140
2	2016-08--03	2890
3	2016-08--04	3161
4	2016-08--05	2702

Bar chart - Number of visitors per day in different colors

In [ ]:

```
pivot_table = df_all_visitors.pivot(index="date", columns="visitors_num", values="visito
rs_num")
ax = pivot_table.plot(kind="bar", stacked=True, colormap =  'Blues', figsize=(15, 7))
ax.set_title("Visitors per day from all channels")
ax.set_xlabel("Date")
ax.set_ylabel("Visitors")
```

Out[ ]:

```
Text(0, 0.5, 'Visitors')
```