Uber-Daten aus New York

Die Datensatz ist von Kaggle. Uber New York Data beschreibt Uber Daten in New York.

die Notwendige packete importieren

- pandas:bietet Hilfsmittel für die Verwaltung von Daten und deren Analyse
- seaborn:bietet eine High-Level-Schnittstelle zum Zeichnen attraktiver und informativer statistischer Grafiken.
- numpy:ermöglicht eine einfache Handhabung von Vektoren, Matrizen oder generell großen mehrdimensionalen Arrays
- matpotlib: urlaubt mathematische Darstellungen aller Art anzufertigen.
- os:bietet Funktionen zur Interaktion mit dem Betriebssystem.
- glob: wird verwendet, um Dateien/Pfadnamen abzurufen,

In [1]:

```
import pandas as pd
import seaborn as sns
import numpy as np
import matplotlib.pyplot as plt
import os
import glob
```

die Datein im ordner anzeigen lassen

In [2]:

```
files = os.listdir(r'C:\Users\khale\OneDrive\Desktop\educx_weiterbildung\Woche4\uber')
files
```

Out[2]:

```
['.DS_Store',
 'Readme.txt',
 'uber-raw-data-apr14.csv',
 'uber-raw-data-aug14.csv',
 'uber-raw-data-jul14.csv',
 'uber-raw-data-jun14.csv',
 'uber-raw-data-may14.csv',
 'uber-raw-data-sep14.csv']
```

Alle csv datein einlesen einzeln dann verketten in eine einzelne DataFrame

In [3]:

```
df = pd.concat(map(pd.read_csv, glob.glob(r'C:\Users\khale\OneDrive\Desktop\educx_weiterbildung\Woche4\uber\*.csv')))
```

Ein copy aus der dataframe erstellen damit python nicht jedes mal die datein aus dem Ordner einliest

In [4]:

```
df = df.copy()
```

die erste 5 Elemente der Dataframe anzeigen

In [5]:

```
df.head()
```

Out[5]:

	Date/Time	Lat	Lon	Base
0	4/1/2014 0:11:00	40.7690	-73.9549	B02512
1	4/1/2014 0:17:00	40.7267	-74.0345	B02512
2	4/1/2014 0:21:00	40.7316	-73.9873	B02512
3	4/1/2014 0:28:00	40.7588	-73.9776	B02512
4	4/1/2014 0:33:00	40.7594	-73.9722	B02512

zahlen der zeilen und spalten der Dataframe anzeigen

In [6]:

```
df.shape
```

Out[6]:

```
(4534327, 4)
```

die verschiene types der dataframe anzeigen

In [7]:

```
df.dtypes
```

Out[7]:

```
Date/Time     object
Lat          float64
Lon          float64
```

```
Base          object
dtype: object
```

rechnen die summer der null stellen in der Dataframe pro spalte

In [8]:

```
df.isna().sum()
```

Out[8]:

```
Date/Time    0
Lat          0
Lon          0
Base         0
dtype: int64
```

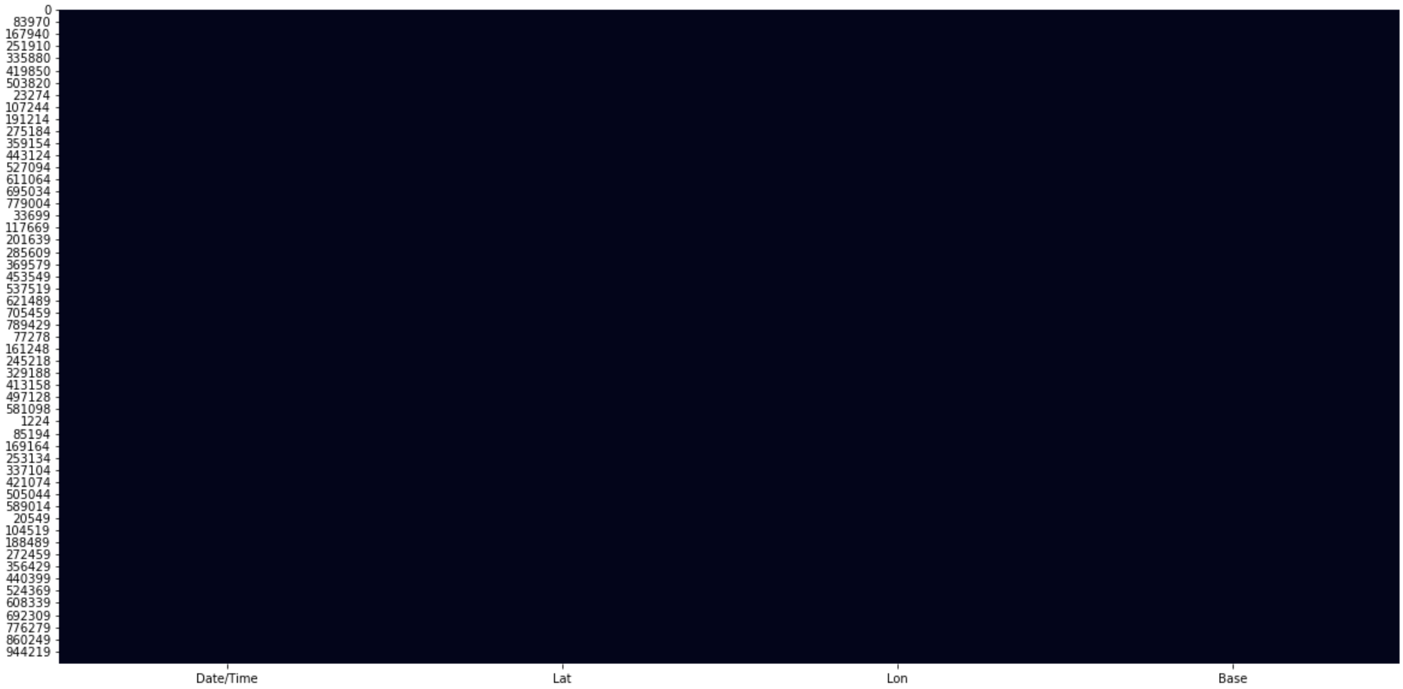
mit hilfe von seaborn, die null stellen in eine Graphik darstellen

In [9]:

```
#gucken ob null stellen in der data frame gibt
plt.figure(figsize=(20,10))
sns.heatmap(df.isna(),cbar=False)
```

Out[9]:

```
<AxesSubplot:>
```



die spalte 'Date/time' zu datetime objekt umwandeln

In [10]:

```
df['Date/Time'] = pd.to_datetime(df['Date/Time'], format="%m/%d/%Y %H:%M:%S")
```

daten type der Dataframe anzeigen

In [11]:

```
# daten type von der frame anzeigen
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 4534327 entries, 0 to 1028135
Data columns (total 4 columns):
 #   Column     Dtype
---  ------     -----
 0   Date/Time  datetime64[ns]
 1   Lat        float64
 2   Lon        float64
 3   Base       object
dtypes: datetime64[ns](1), float64(2), object(1)
memory usage: 173.0+ MB
```

die erste 5 elemente anzeigen der Dataframe

In [12]:

```
df.head()
```

Out[12]:

	Date/Time	Lat	Lon	Base
0	2014-04-01 00:11:00	40.7690	-73.9549	B02512
1	2014-04-01 00:17:00	40.7267	-74.0345	B02512
2	2014-04-01 00:21:00	40.7316	-73.9873	B02512
3	2014-04-01 00:28:00	40.7588	-73.9776	B02512
4	2014-04-01 00:33:00	40.7594	-73.9722	B02512

date time objekt in tag wochen minute und stunde zerlegen (um die rechnung zu vereinfachen später)

In [13]:

```
df['weekday']=df['Date/Time'].dt.day_name()
df['day']=df['Date/Time'].dt.day
df['minute']=df['Date/Time'].dt.minute
df['month']=df['Date/Time'].dt.month
df['hour']=df['Date/Time'].dt.hour
```

die 5 zeilen der Dataframe anzeigen

In [14]:

```
df.head()
```

Out[14]:

	Date/Time	Lat	Lon	Base	weekday	day	minute	month	hour
0	2014-04-01 00:11:00	40.7690	-73.9549	B02512	Tuesday	1	11	4	0
1	2014-04-01 00:17:00	40.7267	-74.0345	B02512	Tuesday	1	17	4	0
2	2014-04-01 00:21:00	40.7316	-73.9873	B02512	Tuesday	1	21	4	0
3	2014-04-01 00:28:00	40.7588	-73.9776	B02512	Tuesday	1	28	4	0
4	2014-04-01 00:33:00	40.7594	-73.9722	B02512	Tuesday	1	33	4	0

daten type der neue Dataframe anzeigen

In [15]:

```
df.dtypes
```

Out[15]:

```
Date/Time    datetime64[ns]
Lat                 float64
Lon                 float64
Base                 object
weekday              object
day                   int64
minute                int64
month                 int64
hour                  int64
dtype: object
```

die einzelne Elemente der Spalte 'Base' anzeigen

In [16]:

```
df['Base'].unique()
```

Out[16]:

```
array(['B02512', 'B02598', 'B02617', 'B02682', 'B02764'], dtype=object)
```

die einzelne Elemente der Spalte 'day' anzeigen

In [17]:

```
df['day'].unique()
```

Out[17]:

```
array([ 1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13, 14, 15, 16, 17,
       18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31],
      dtype=int64)
```

die einzelne Elemente der Spalte 'weekday' anzeigen

In [18]:

```
df['weekday'].unique()
```

Out[18]:

```
array(['Tuesday', 'Wednesday', 'Thursday', 'Friday', 'Saturday', 'Sunday',
       'Monday'], dtype=object)
```

In Welchen Wochen tag werden taxi am Meinsten benötigt

Dataframe gruppieren nach 'weekday' und zählen pro spalte

In [19]:

```
dataPerDayofWeek = df.groupby('weekday').count()
```

In [20]:

```
#dataPerDayofWeek.sort_values(by=['weekday'])
```

dictionary erzeugen mit wochentage als keys

In [21]:

```
sorter = ['Sunday', 'Monday', 'Tuesday', 'Wednesday', 'Thursday', 'Friday', 'Saturday']
sorterIndex = dict(zip(sorter,range(len(sorter))))
sorterIndex
```

Out[21]:

```
{'Sunday': 0,
 'Monday': 1,
 'Tuesday': 2,
 'Wednesday': 3,
 'Thursday': 4,
 'Friday': 5,
 'Saturday': 6}
```

neue Spalte erstellen die Wochentage zugewisene value nummer enthählt

In [22]:

```
dataPerDayofWeek['Day_id'] = dataPerDayofWeek.index
dataPerDayofWeek['Day_id'] = dataPerDayofWeek['Day_id'].map(sorterIndex)
dataPerDayofWeek.head()
```

Out[22]:

	Date/Time	Lat	Lon	Base	day	minute	month	hour	Day_id
weekday									
Friday	741139	741139	741139	741139	741139	741139	741139	741139	5
Monday	541472	541472	541472	541472	541472	541472	541472	541472	1
Saturday	646114	646114	646114	646114	646114	646114	646114	646114	6
Sunday	490180	490180	490180	490180	490180	490180	490180	490180	0
Thursday	755145	755145	755145	755145	755145	755145	755145	755145	4

Dataframe sortieren nach 'Day_id'

In [23]:

```
dataPerDayofWeek.sort_values('Day_id', inplace=True)
dataPerDayofWeek
```

Out[23]:

	Date/Time	Lat	Lon	Base	day	minute	month	hour	Day_id
weekday									

	Date/Time	Lat	Lon	Base	day	minute	month	hour	Day_id
weekday									
Sunday	490180	490180	490180	490180	490180	490180	490180	490180	0
Monday	541472	541472	541472	541472	541472	541472	541472	541472	1
Tuesday	663789	663789	663789	663789	663789	663789	663789	663789	2
Wednesday	696488	696488	696488	696488	696488	696488	696488	696488	3
Thursday	755145	755145	755145	755145	755145	755145	755145	755145	4
Friday	741139	741139	741139	741139	741139	741139	741139	741139	5
Saturday	646114	646114	646114	646114	646114	646114	646114	646114	6

die spalte 'Base' anzeigen

In [24]:

```
dataPerDayofWeek['Base']
```

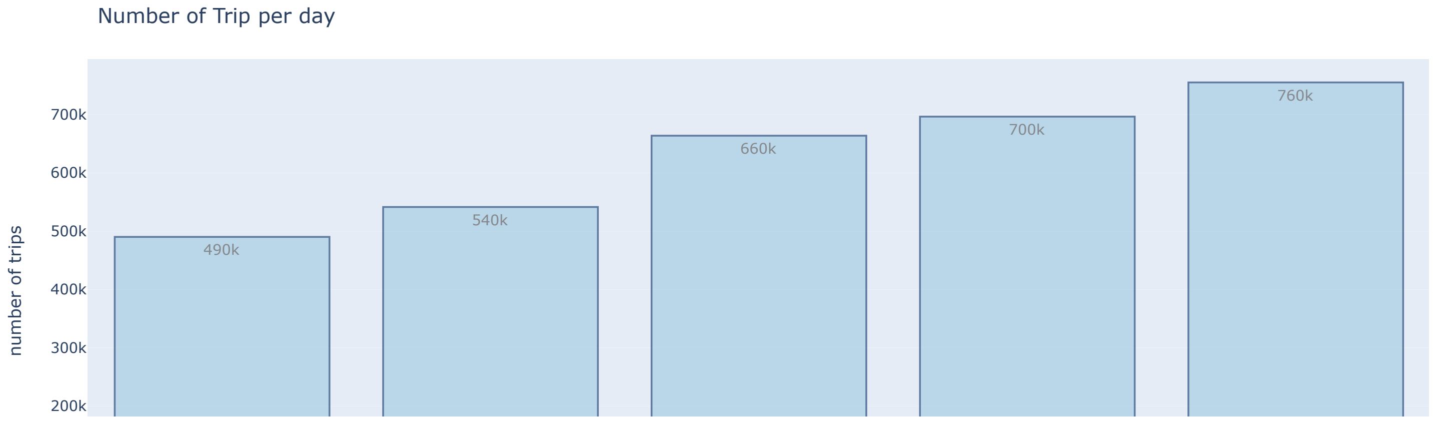
Out[24]:

```
weekday
Sunday       490180
Monday       541472
Tuesday      663789
Wednesday    696488
Thursday     755145
Friday       741139
Saturday     646114
Name: Base, dtype: int64
```

Säulendiagramm : darstellung von zahl der fahrten pro wochentag

In [25]:

```
import plotly.express as px
fig = px.bar(dataPerDayofWeek['Base'],labels={'value':'number of trips'},text_auto='.2s')
fig.update_traces(marker_color='rgb(158,202,225)', marker_line_color='rgb(8,48,107)',
                  marker_line_width=1.5, opacity=0.6)
fig.update_layout(title_text='Number of Trip per day')

fig.show()
# am donnerstag gibts der meinsten fahrten
```



welche uhrzeit werden am meinsten taxi benötigt

die stunden tag zu x und zahl der fahrt pro stundent tag zu y zuweisen

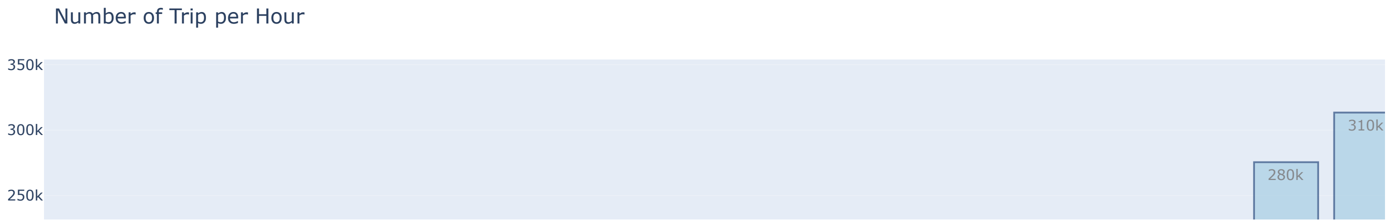
In [26]:

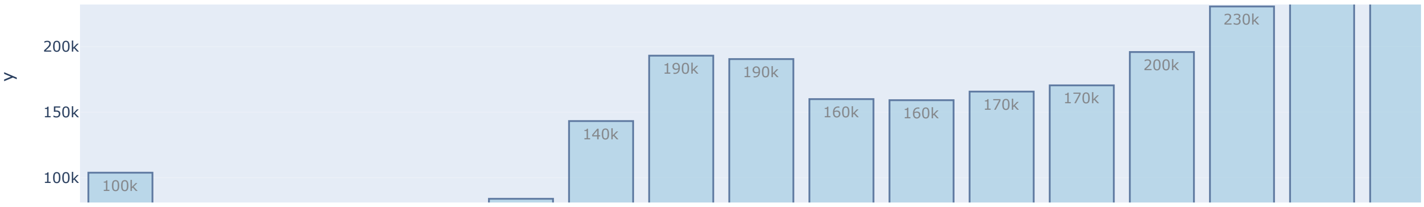
```
x= df['hour'].value_counts().index
y = df['hour'].value_counts().values
```

Säulendiagramm : darstellung von zahl der fahrten pro stundentag

In [27]:

```
fig = px.bar(df,x,y,labels={'value':'number of trips'},text_auto='.2s')
fig.update_traces(marker_color='rgb(158,202,225)', marker_line_color='rgb(8,48,107)',
                  marker_line_width=1.5, opacity=0.6)
fig.update_layout(title_text='Number of Trip per Hour')

fig.show()

#um 17 uhr wird am meinsten taxi benötigt !
```





Anzahl der Fahrten pro stunden in jedes Monat

Dataframe monaten position anzeigen

In [28]:

```
for month in df['month'].unique():
    print(month)
```

```
4
8
7
6
5
9
```

In [29]:

```
 df[df['month']==4]['hour'].head()
```

Out[29]:

```
0    0
1    0
2    0
3    0
4    0
Name: hour, dtype: int64
```

in der 4ten monat zahl der fahrten in verschiedene Uhrzeiten

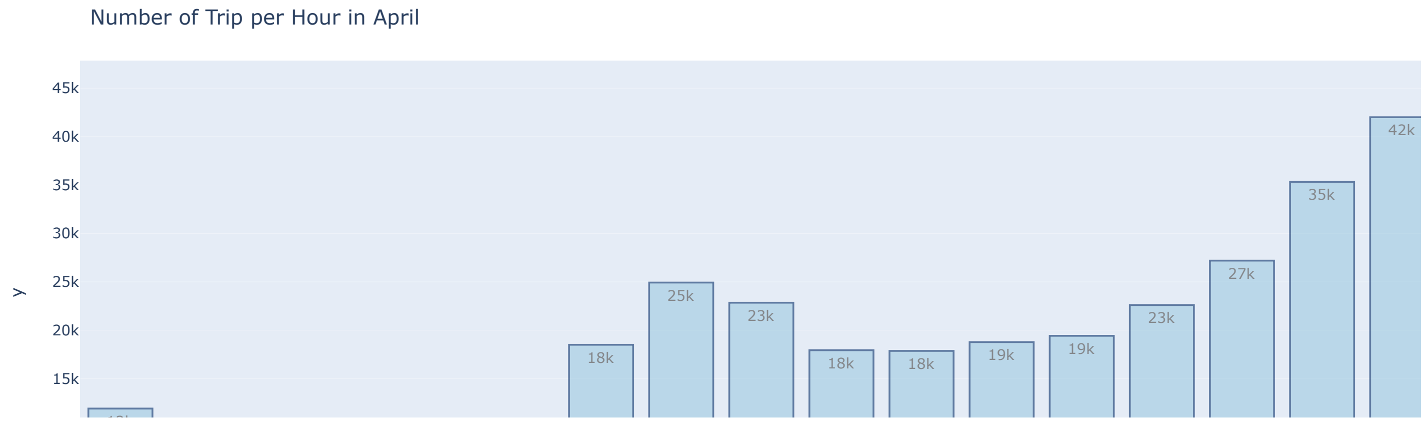
In [30]:

```
# in der 4ten monat zahl der fahrten in verschiedene Uhrzeiten
x_ = df[df['month']==4].hour.value_counts().index
y_ = df[df['month']==4].hour.value_counts().values
```

Seulendiagramm: zahl der fahrten pro stundentag in der 4ten monat

In [31]:

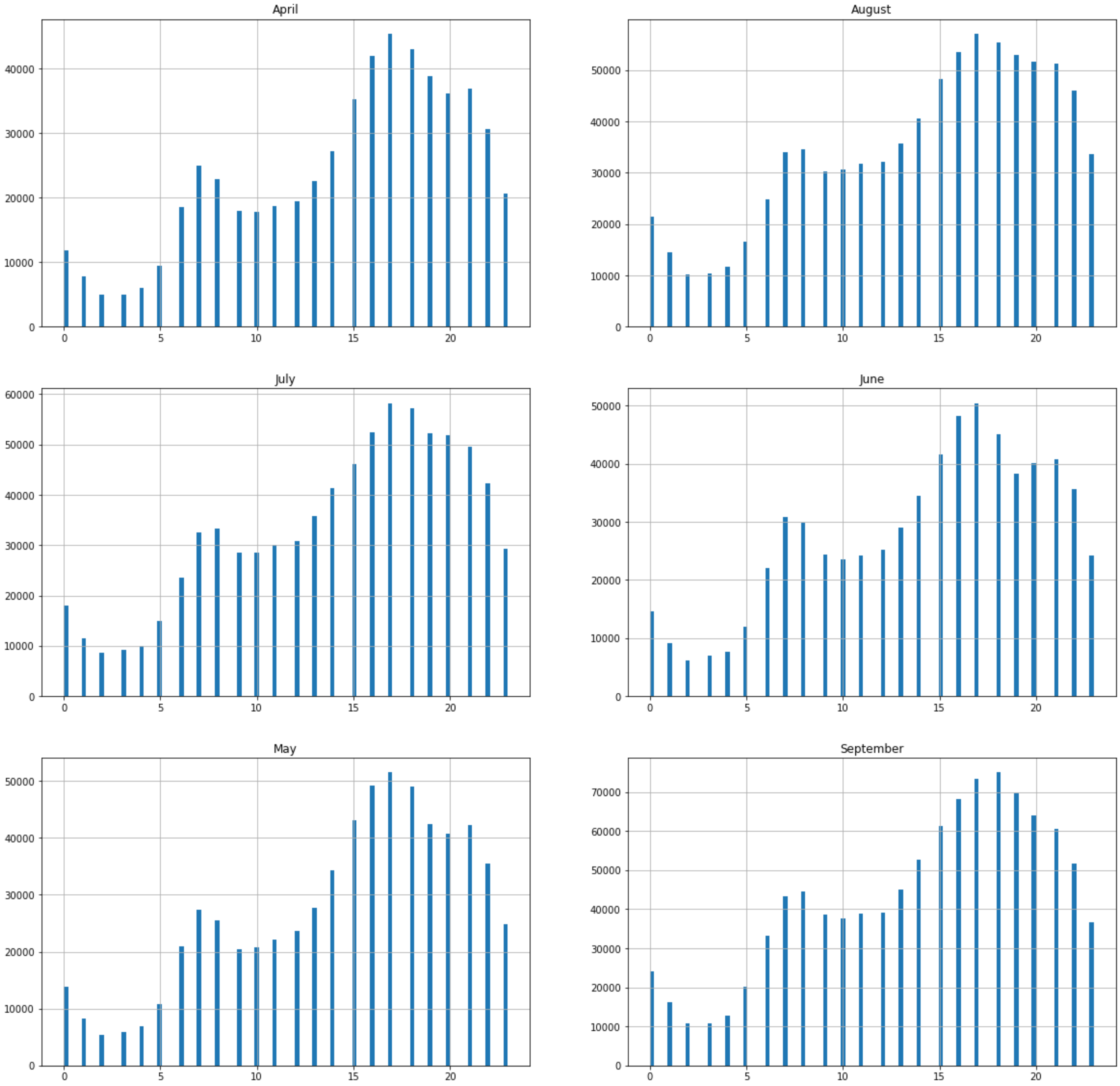
```
fig = px.bar(df[df['month']==4],x_,y_,labels={'value':'number of trips'},text_auto='.2s')
fig.update_traces(marker_color='rgb(158,202,225)', marker_line_color='rgb(8,48,107)',
                  marker_line_width=1.5, opacity=0.6)
fig.update_layout(title_text='Number of Trip per Hour in April')

fig.show()
```



zahl der fahrten in verschiedene Uhrzeiten im monat April, August,July,juni,May und September

In [32]:

```
month_ = {      '1':'Janauary',
                '2':'February',
                '3':'March',
                '4':'April',
                '5':'May',
                '6':'June',
                '7':'July',
                '8':'August',
                '9':'September',
                '10':'October',
                '11':'November',
                '12':'December'}
plt.figure(figsize=(20,20))
for i,month in enumerate(df['month'].unique()):
    plt.subplot(3,2,i+1)
    plt.title("{}".format(month_[str(month)]))
    df[df['month']==month]['hour'].hist(bins=100)
```



zu welche monat werden die meinsten fahrt benötigt

In [33]:

```
dataPermonth = df.groupby('month').count()
dataPermonth
```

Out[33]:

	Date/Time	Lat	Lon	Base	weekday	day	minute	hour
month								
4	564516	564516	564516	564516	564516	564516	564516	564516
5	652435	652435	652435	652435	652435	652435	652435	652435
6	663844	663844	663844	663844	663844	663844	663844	663844
7	796121	796121	796121	796121	796121	796121	796121	796121
8	829275	829275	829275	829275	829275	829275	829275	829275
9	1028136	1028136	1028136	1028136	1028136	1028136	1028136	1028136

`monat zahl mit monat string ubennen`

In [34]:

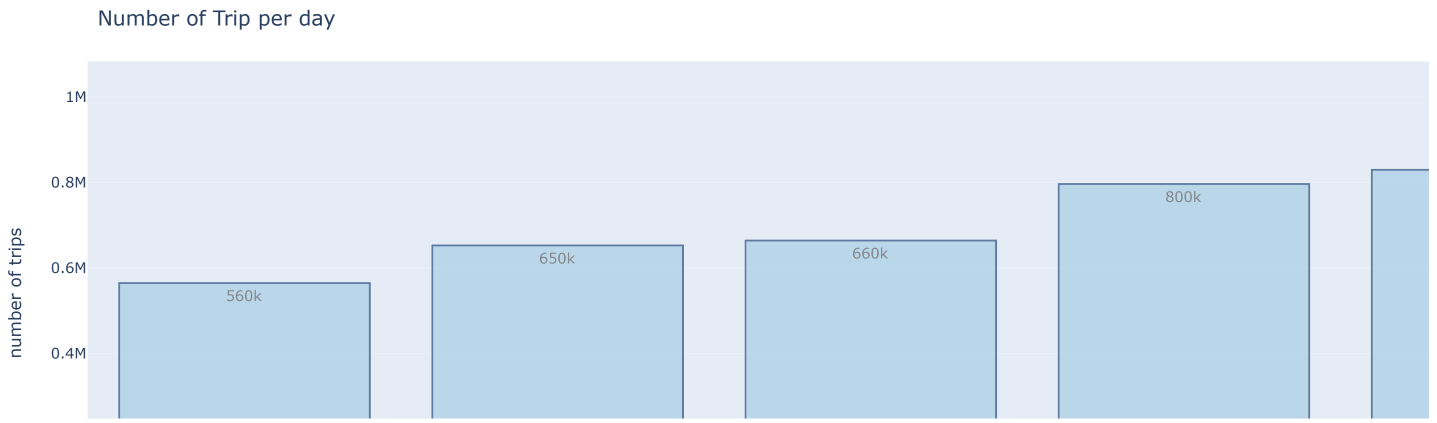
```
dataPermonth= dataPermonth.rename(index={4:'April',5:'May',6:'June',7:'July',8:'August',9:'September'})
```

`Saulendiagramm: zahl der fahrten pro monat`

In [35]:

```
import plotly.express as px
```

```
fig = px.bar(dataPermonth['Base'],labels={'value':'number of trips'},text_auto='.2s')
fig.update_traces(marker_color='rgb(158,202,225)', marker_line_color='rgb(8,48,107)',
                  marker_line_width=1.5, opacity=0.6)
fig.update_layout(title_text='Number of Trip per day')

fig.show()

#september hat die meinsten fahrt !
```



Zahl der uber pro stunden Wochen tag

In [36]:

```
df.head()
```

Out[36]:

	Date/Time	Lat	Lon	Base	weekday	day	minute	month	hour
0	2014-04-01 00:11:00	40.7690	-73.9549	B02512	Tuesday	1	11	4	0
1	2014-04-01 00:17:00	40.7267	-74.0345	B02512	Tuesday	1	17	4	0
2	2014-04-01 00:21:00	40.7316	-73.9873	B02512	Tuesday	1	21	4	0
3	2014-04-01 00:28:00	40.7588	-73.9776	B02512	Tuesday	1	28	4	0
4	2014-04-01 00:33:00	40.7594	-73.9722	B02512	Tuesday	1	33	4	0

data frame nach 'weekday' und 'hour' gruppieren

In [37]:

```
df_hour_day = df.groupby(["weekday","hour"]).count().Base
```

Dataframe nach gruppierung Anzeigen

In [38]:

```
df_hour_day.head()
```

Out[38]:

```
weekday  hour
Friday   0       13716
         1        8163
         2        5350
         3        6930
         4        8806
Name: Base, dtype: int64
```

Dataframe pivotieren nach index weekday

In [39]:

```
pivot = df_hour_day.unstack()
pivot
```

Out[39]:

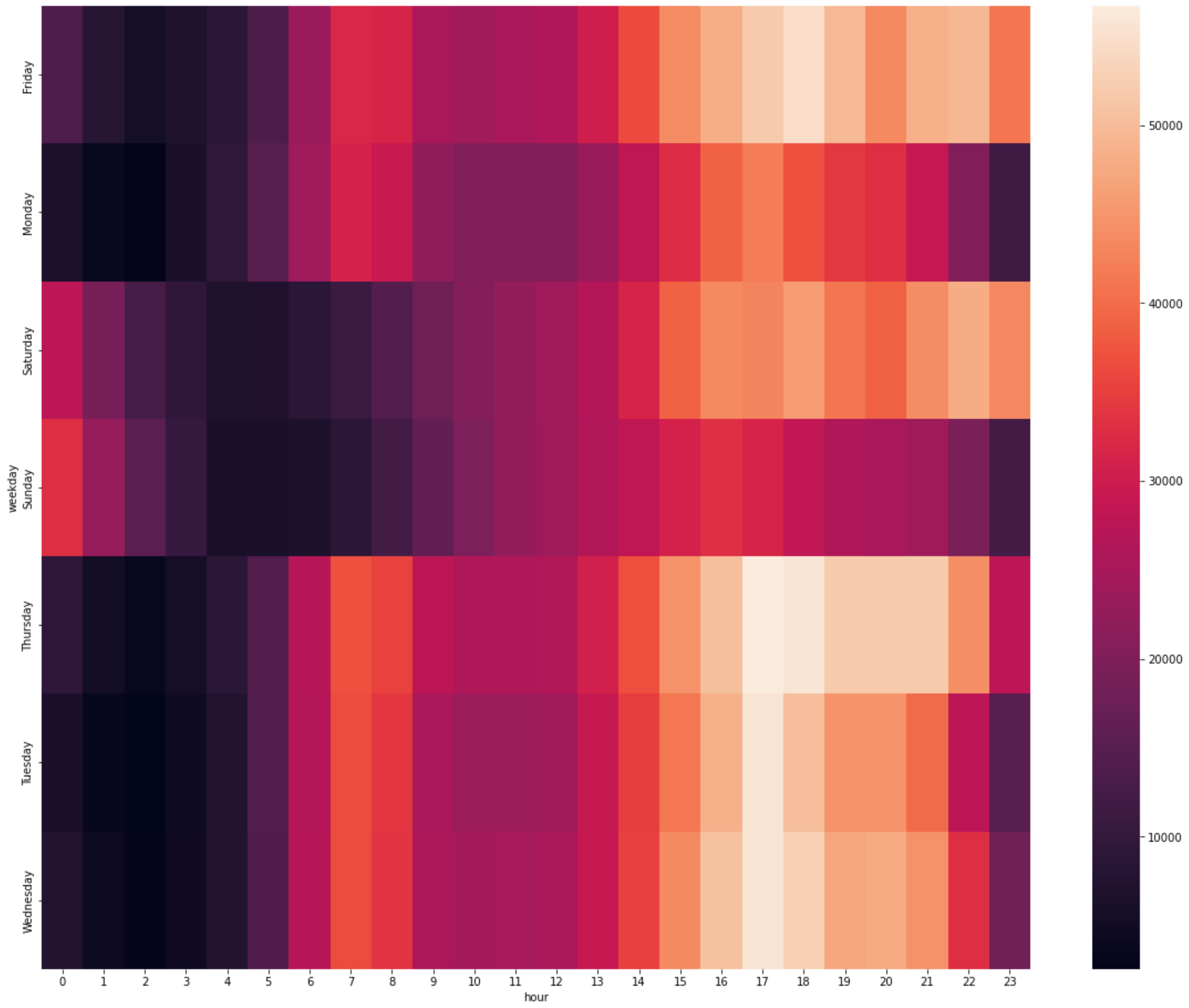
hour	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**...**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**
weekday																					
Friday	13716	8163	5350	6930	8806	13450	23412	32061	31509	25230	...	36206	43673	48169	51961	54762	49595	43542	48323	49409	41260
Monday	6436	3737	2938	6232	9640	15032	23746	31159	29265	22197	...	28157	32744	38770	42023	37000	34159	32849	28925	20158	11811
Saturday	27633	19189	12710	9542	6846	7084	8579	11014	14411	17669	...	31418	38769	43512	42844	45883	41098	38714	43826	47951	43174
Sunday	32877	23015	15436	10597	6374	6169	6596	8728	12128	16401	...	28151	31112	33038	31521	28291	25948	25076	23967	19566	12166
Thursday	9293	5290	3719	5637	8505	14169	27065	37038	35431	27812	...	36699	44442	50560	56704	55825	51907	51990	51953	44194	27764
Tuesday	6237	3509	2571	4494	7548	14241	26872	36599	33934	25023	...	34846	41338	48667	55500	50186	44789	44661	39913	27712	14869
Wednesday	7644	4324	3141	4855	7511	13794	26943	36495	33826	25635	...	35148	43388	50684	55637	52732	47017	47772	44553	32868	18146

7 rows × 24 columns

Heatmap: heufigkeit verteilung der fahrten pro stunde in verchiedene wochentage

In [49]:

```
plt.figure(figsize=(20,16))
sns.heatmap(pivot, annot=False);
```



Uber Base Analyse

In [40]:

```
df.head()
```

Out[40]:

	Date/Time	Lat	Lon	Base	weekday	day	minute	month	hour
0	2014-04-01 00:11:00	40.7690	-73.9549	B02512	Tuesday	1	11	4	0
1	2014-04-01 00:17:00	40.7267	-74.0345	B02512	Tuesday	1	17	4	0
2	2014-04-01 00:21:00	40.7316	-73.9873	B02512	Tuesday	1	21	4	0
3	2014-04-01 00:28:00	40.7588	-73.9776	B02512	Tuesday	1	28	4	0
4	2014-04-01 00:33:00	40.7594	-73.9722	B02512	Tuesday	1	33	4	0

```
Dataframe gruppieren nach 'Base' und 'mounth'
```

In [41]:

```
base = df.groupby(['Base','month'])['Date/Time'].count().reset_index()
base.tail()
```

Out[41]:

	Base	month	Date/Time
25	B02764	5	9504
26	B02764	6	8974
27	B02764	7	8589
28	B02764	8	48591
29	B02764	9	178333

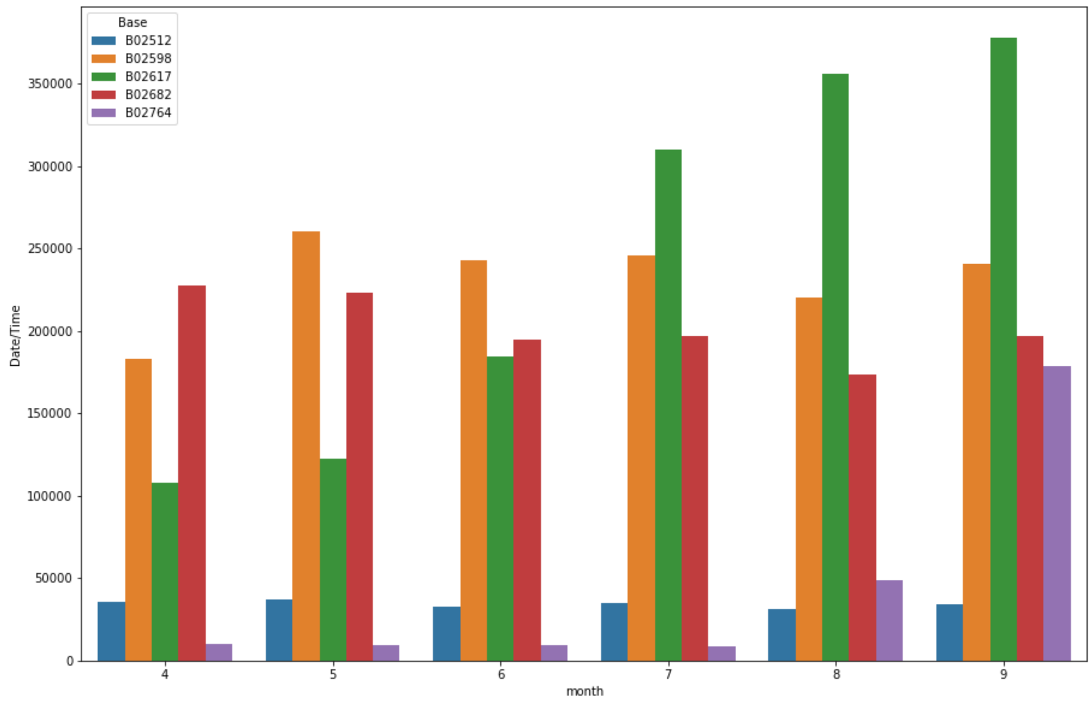
```
Saulendiagramm : Zahl der fahrten pro 'Base' in verschiedene Monaten
```

In [54]:

```
plt.figure(figsize=(15,10))
sns.barplot(x='month',y='Date/Time',hue='Base',data=base)
```

Out[54]:

```
<AxesSubplot:xlabel='month', ylabel='Date/Time'>
```



Daten Auf der Karte Visualisieren

In [55]:

```
data = df[['Date/Time','Lat','Lon','Base']]
data.tail()
```

Out[55]:

	Date/Time	Lat	Lon	Base
1028131	2014-09-30 22:57:00	40.7668	-73.9845	B02764
1028132	2014-09-30 22:57:00	40.6911	-74.1773	B02764
1028133	2014-09-30 22:58:00	40.8519	-73.9319	B02764
1028134	2014-09-30 22:58:00	40.7081	-74.0066	B02764
1028135	2014-09-30 22:58:00	40.7140	-73.9496	B02764

aus open street map ! die karte begrenzen

40.66704 , -73.83396 oben links

40.90366, -74.10665 unten recht

In [58]:

```
dataFiltered = data\
    .where(data.Lat > 40.66704)\
    .where(data.Lat < 40.90366 )\
    .where(data.Lon < -73.83396)\
    .where(data.Lon > -74.10665)
```

die gefilterte Dataframe anzeigen

In [59]:

```
dataFiltered.head()
```

Out[59]:

	Date/Time	Lat	Lon	Base
0	2014-04-01 00:11:00	40.7690	-73.9549	B02512
1	2014-04-01 00:17:00	40.7267	-74.0345	B02512
2	2014-04-01 00:21:00	40.7316	-73.9873	B02512
3	2014-04-01 00:28:00	40.7588	-73.9776	B02512
4	2014-04-01 00:33:00	40.7594	-73.9722	B02512

zahl der gelöschte zeilen berechnen

In [60]:

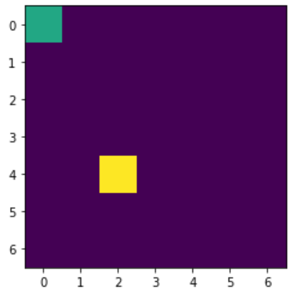
```
print(data.Base.count())
print(dataFiltered.Base.count())
#fast 10% der daten sind gelöscht
```

```
4534327
4236494
```

image aus eine matrix erzeugen zum testen

In [62]:

```
rawImage = [
    [60,0,0,0,0,0,0],
    [0,0,0,0,0,0,0],
    [0,0,0,0,0,0,0],
    [0,0,0,0,0,0,0],
    [0,0,100,0,0,0,0],
    [0,0,0,0,0,0,0],
    [0,0,0,0,0,0,0]
]
plt.imshow(rawImage)
plt.show()
```



In [63]:

```
# Rechts Unten 40.66704 , -73.83396 [0][0]
# Links Oben 40.90366, -74.10665 [6][6]
# 40.8000 , -73.95000 => [3][3]
```

Test: die position von eine geographische punkt (40.800,-73.95000) auf die erzeugene coordinaten system berechnen

In [65]:

```
#TEST
expLat = 40.80000 #Lat
expLat2 = (expLat - 40.66704)/(40.90366-40.66704)
print(round(expLat2 * 7))

expLon =  -73.95000  # Lon
expLon2 = (expLon + 74.10665 )/(-73.83396 + 74.10665 )
print ( round (expLon2 * 7) )

# ==> diese punkt (pixel liegt an der position (4.4))
```

```
4
4
```

die position von alle geographische punkte aus der Dataframe auf die erzeugene coordinaten system berechnen berechnen

In [66]:

```
size = 10
dataFiltered2 = ((dataFiltered.Lat - 40.66704)/(40.90366-40.66704)) * size
```

In [67]:

```
dataFiltered2.round()
```

Out[67]:

```
0          4.0
1          3.0
2          3.0
3          4.0
4          4.0
          ...
1028131    4.0
1028132    NaN
1028133    8.0
1028134    2.0
1028135    2.0
Name: Lat, Length: 4534327, dtype: float64
```

In [68]:

```
dataFiltered_final = dataFiltered[['Lat','Lon']]
dataFiltered_final.Lat= (((dataFiltered_final.Lat - 40.66704)/(40.90366-40.66704)) * size)
dataFiltered_final.Lon = (((dataFiltered_final.Lon + 73.83396)/(-74.10665 + 73.83396 ))*size)
```

```
C:\Users\khale\anaconda3\lib\site-packages\pandas\core\generic.py:5516: SettingWithCopyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
```

In [69]:

```
dataFiltered_final = dataFiltered_final.round()
```

In [70]:

```
dataFiltered_final
```

Out[70]:

	Lat	Lon
0	4.0	4.0
1	3.0	7.0
2	3.0	6.0
3	4.0	5.0
4	4.0	5.0
...	...	...
1028131	4.0	6.0
1028132	NaN	NaN
1028133	8.0	4.0
1028134	2.0	6.0
1028135	2.0	4.0

4534327 rows × 2 columns

data frame gruppieren nach 'Lon' und 'lat' und die heufigkeit pro (Lat,Lon) berechnen

In [71]:

```
dataForImage = dataFiltered_final.groupby(['Lat','Lon']).size().reset_index(name="count")
dataForImage
```

Out[71]:

	Lat	Lon	count
0	0.0	0.0	255
1	0.0	1.0	625
2	0.0	2.0	887
3	0.0	3.0	2451
4	0.0	4.0	14862
...	...	...	...
115	10.0	6.0	44
116	10.0	7.0	22
117	10.0	8.0	70
118	10.0	9.0	24
119	10.0	10.0	9

120 rows × 3 columns

ein bild erzeugen die standart mässig dunkel ist (Array aus dem nullen besteht)

In [73]:

```
# ein bild erzeugen die standart mässig dunkel ist (Array aus dem nullen besteht)

img = []
for i in range(0,size + 1):
    imgRow = []
    for j in range (0, size + 1):
        imgRow.append(0)
    img.append(imgRow)

#print(img)
```

bild arrays mit der heufigkeit verteilung von der Lon und Lan erzetsen

In [75]:

```
for i in range(len(dataForImage)):
    img[size - int(dataForImage.loc[i,"Lat"])][size - int(dataForImage.loc[i,"Lon"])] = math.log(dataForImage.loc[i,"count"])
```

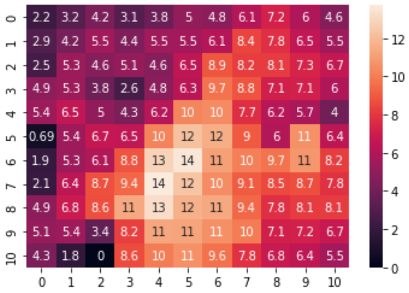
um das ergebniss bessere zu verstehen, heatmap wird mit der heufigkeit verteilung der geographische coordinaten erzeugt

In [76]:

```
img_np = np.array(img)
#img_np
```

In [78]:

```
hm = sns.heatmap(data=img_np,annot=True)
plt.figure(figsize=(30,15))
plt.show()
```

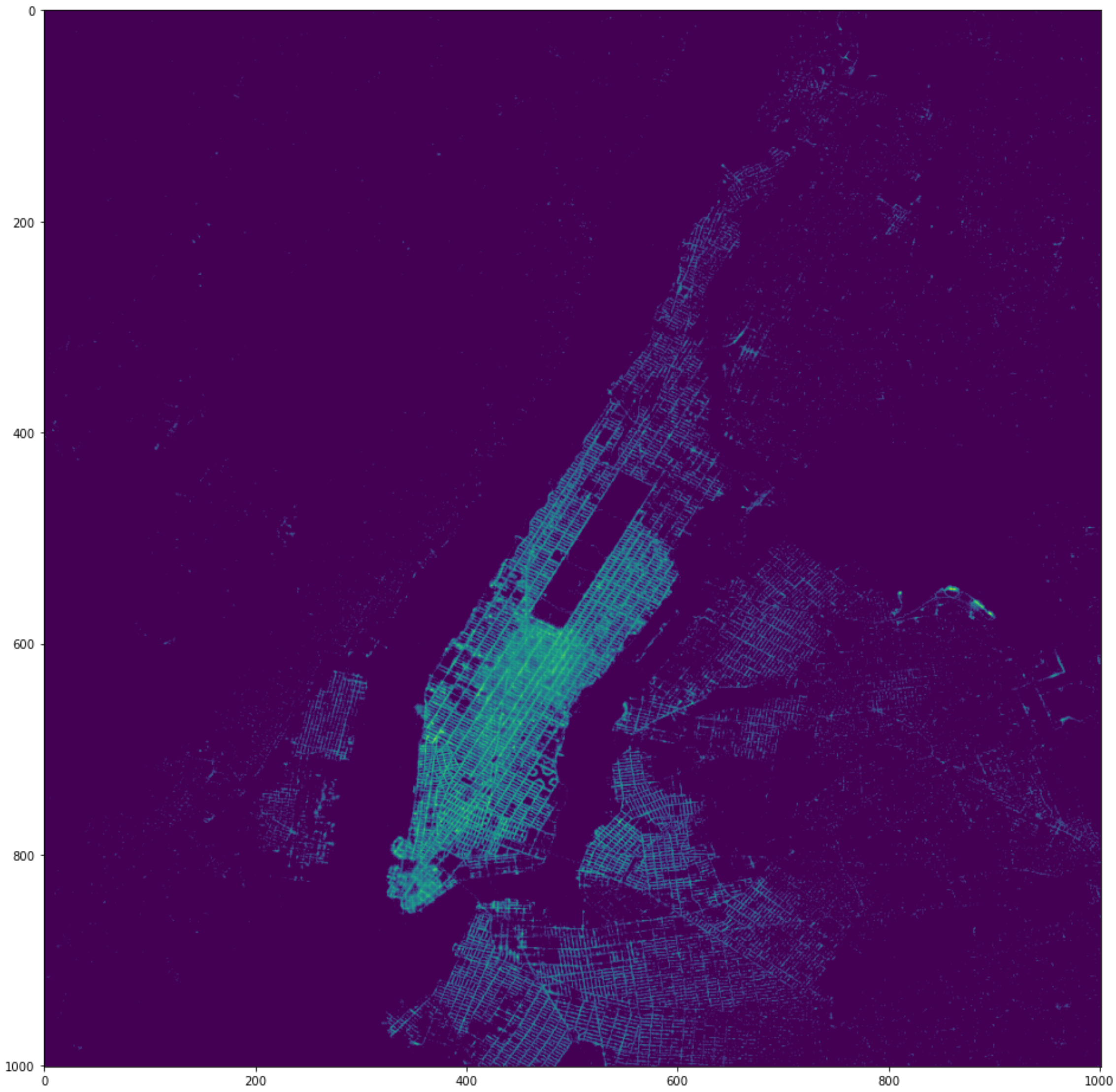


```
<Figure size 2160x1080 with 0 Axes>
```

heufigkeit verteilung der coordinaten system matrix als bild anzeigen

In [479…

```
plt.figure(figsize=(16,25))
plt.imshow(img)
plt.show()
```



In [79]:

```
!pip install pandoc
```

```
Collecting pandoc
  Downloading pandoc-2.1.tar.gz (29 kB)
Collecting plumbum
  Downloading plumbum-1.7.2-py2.py3-none-any.whl (117 kB)
Requirement already satisfied: ply in c:\users\khale\anaconda3\lib\site-packages (from pandoc) (3.11)
Requirement already satisfied: pywin32 in c:\users\khale\anaconda3\lib\site-packages (from plumbum->pandoc) (228)
Building wheels for collected packages: pandoc
  Building wheel for pandoc (setup.py): started
  Building wheel for pandoc (setup.py): finished with status 'done'
  Created wheel for pandoc: filename=pandoc-2.1-py3-none-any.whl size=29536 sha256=f3e73b0bf21f4e0406a4738e7fb2c6f321f4ee28898a1e3adfffa4a9f0c6c385
  Stored in directory: c:\users\khale\appdata\local\pip\cache\wheels\20\e3\a0\b21b97b236e86bfc68e8cfa4baba1a854212cb06772de592d9
Successfully built pandoc
Installing collected packages: plumbum, pandoc
Successfully installed pandoc-2.1 plumbum-1.7.2
```

In [80]:

```
!pip install nbconvert
```

```
Requirement already satisfied: nbconvert in c:\users\khale\anaconda3\lib\site-packages (6.1.0)
Requirement already satisfied: jupyterlab-pygments in c:\users\khale\anaconda3\lib\site-packages (from nbconvert) (0.1.2)
Requirement already satisfied: mistune<2,>=0.8.1 in c:\users\khale\anaconda3\lib\site-packages (from nbconvert) (0.8.4)
Requirement already satisfied: traitlets>=5.0 in c:\users\khale\anaconda3\lib\site-packages (from nbconvert) (5.1.0)
Requirement already satisfied: jinja2>=2.4 in c:\users\khale\anaconda3\lib\site-packages (from nbconvert) (2.11.3)
Requirement already satisfied: jupyter-core in c:\users\khale\anaconda3\lib\site-packages (from nbconvert) (4.8.1)
Requirement already satisfied: nbformat>=4.4 in c:\users\khale\anaconda3\lib\site-packages (from nbconvert) (5.1.3)
Requirement already satisfied: testpath in c:\users\khale\anaconda3\lib\site-packages (from nbconvert) (0.5.0)
Requirement already satisfied: pandocfilters>=1.4.1 in c:\users\khale\anaconda3\lib\site-packages (from nbconvert) (1.4.3)
Requirement already satisfied: entrypoints>=0.2.2 in c:\users\khale\anaconda3\lib\site-packages (from nbconvert) (0.3)
Requirement already satisfied: bleach in c:\users\khale\anaconda3\lib\site-packages (from nbconvert) (4.0.0)
Requirement already satisfied: pygments>=2.4.1 in c:\users\khale\anaconda3\lib\site-packages (from nbconvert) (2.10.0)
Requirement already satisfied: defusedxml in c:\users\khale\anaconda3\lib\site-packages (from nbconvert) (0.7.1)
Requirement already satisfied: nbclient<0.6.0,>=0.5.0 in c:\users\khale\anaconda3\lib\site-packages (from nbconvert) (0.5.3)
Requirement already satisfied: MarkupSafe>=0.23 in c:\users\khale\anaconda3\lib\site-packages (from jinja2>=2.4->nbconvert) (1.1.1)
Requirement already satisfied: jupyter-client>=6.1.5 in c:\users\khale\anaconda3\lib\site-packages (from nbclient<0.6.0,>=0.5.0->nbconvert) (6.1.12)
Requirement already satisfied: async-generator in c:\users\khale\anaconda3\lib\site-packages (from nbclient<0.6.0,>=0.5.0->nbconvert) (1.10)
Requirement already satisfied: nest-asyncio in c:\users\khale\anaconda3\lib\site-packages (from nbclient<0.6.0,>=0.5.0->nbconvert) (1.5.1)
Requirement already satisfied: pyzmq>=13 in c:\users\khale\anaconda3\lib\site-packages (from jupyter-client>=6.1.5->nbclient<0.6.0,>=0.5.0->nbconvert) (22.2.1)
Requirement already satisfied: tornado>=4.1 in c:\users\khale\anaconda3\lib\site-packages (from jupyter-client>=6.1.5->nbclient<0.6.0,>=0.5.0->nbconvert) (6.1)
Requirement already satisfied: python-dateutil>=2.1 in c:\users\khale\anaconda3\lib\site-packages (from jupyter-client>=6.1.5->nbclient<0.6.0,>=0.5.0->nbconvert) (2.8.2)
Requirement already satisfied: pywin32>=1.0 in c:\users\khale\anaconda3\lib\site-packages (from jupyter-core->nbconvert) (228)
Requirement already satisfied: jsonschema!=2.5.0,>=2.4 in c:\users\khale\anaconda3\lib\site-packages (from nbformat>=4.4->nbconvert) (3.2.0)
Requirement already satisfied: ipython-genutils in c:\users\khale\anaconda3\lib\site-packages (from nbformat>=4.4->nbconvert) (0.2.0)
Requirement already satisfied: six>=1.11.0 in c:\users\khale\anaconda3\lib\site-packages (from jsonschema!=2.5.0,>=2.4->nbformat>=4.4->nbconvert) (1.16.0)
Requirement already satisfied: attrs>=17.4.0 in c:\users\khale\anaconda3\lib\site-packages (from jsonschema!=2.5.0,>=2.4->nbformat>=4.4->nbconvert) (21.2.0)
Requirement already satisfied: setuptools in c:\users\khale\anaconda3\lib\site-packages (from jsonschema!=2.5.0,>=2.4->nbformat>=4.4->nbconvert) (58.0.4)
Requirement already satisfied: pyrsistent>=0.14.0 in c:\users\khale\anaconda3\lib\site-packages (from jsonschema!=2.5.0,>=2.4->nbformat>=4.4->nbconvert) (0.18.0)
Requirement already satisfied: packaging in c:\users\khale\anaconda3\lib\site-packages (from bleach->nbconvert) (21.0)
Requirement already satisfied: webencodings in c:\users\khale\anaconda3\lib\site-packages (from bleach->nbconvert) (0.5.1)
Requirement already satisfied: pyparsing>=2.0.2 in c:\users\khale\anaconda3\lib\site-packages (from packaging->bleach->nbconvert) (3.0.4)
```

This is a heading