Context Since 2008, guests and hosts have used Airbnb to expand on traveling possibilities and present more unique, personalized way of experiencing the world. This dataset describes the listing activity and metrics in NYC, NY for 2019.

In [156]:

```
import numpy as np
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt
import matplotlib.image as mpimg
%matplotlib inline
```

READING DATA

In [4]:

```
df=pd.read_csv('AB_NYC_2019.csv')
```

In [161]:

```
df.head()
```

Out[161]:

	id	name	host_id	host_name	neighbourhood_group	neighbourhood	latitu
0	2539	Clean & quiet apt home by the park	2787	John	Brooklyn	Kensington	40.647
1	2595	Skylit Midtown Castle	2845	Jennifer	Manhattan	Midtown	40.753
2	3647	THE VILLAGE OF HARLEM....NEW YORK !	4632	Elisabeth	Manhattan	Harlem	40.809
3	3831	Cozy Entire Floor of Brownstone	4869	LisaRoxanne	Brooklyn	Clinton Hill	40.685
4	5022	Entire Apt: Spacious Studio/Loft by central park	7192	Laura	Manhattan	East Harlem	40.798

In [13]:

```
df.shape
```

Out[13]:

```
(48895, 16)
```

In [17]:

```
for i in df.columns:
    print(i,'->',df[i].dtypes)
```

```
id -> int64
name -> object
host_id -> int64
host_name -> object
neighbourhood_group -> object
neighbourhood -> object
latitude -> float64
longitude -> float64
room_type -> object
price -> int64
minimum_nights -> int64
number_of_reviews -> int64
last_review -> object
reviews_per_month -> float64
calculated_host_listings_count -> int64
availability_365 -> int64
```

TYPES OF NEIHBOURHOOD AND THEIR NUMBERS

In [23]:

```
df['neighbourhood_group'].value_counts()
```

Out[23]:

```
Manhattan        21661
Brooklyn         20104
Queens            5666
Bronx             1091
Staten Island      373
Name: neighbourhood_group, dtype: int64
```

In [103]:

```
df['room_type'].value_counts()
```

Out[103]:

```
Entire home/apt    25409
Private room       22326
Shared room         1160
Name: room_type, dtype: int64
```

In [101]:

```

```

Out[101]:

```
219517861    327
107434423    232
30283594     121
137358866    103
12243051      96
Name: host_id, dtype: int64
```

In [38]:

```
print('mean rating of pvt room ->',df[df['room_type']=='Private room']['reviews_per_mon
th'].mean())
print('mean rating of shared room ->',df[df['room_type']=='Shared room']['reviews_per_m
onth'].mean())
print('mean rating of Entire home/apt room ->',df[df['room_type']=='Entire home/apt'][
'reviews_per_month'].mean())
```

```
mean rating of pvt room -> 1.4452091706764794
mean rating of shared room -> 1.4717257683215124
mean rating of Entire home/apt room -> 1.3065778083808826
```

In [39]:

```
print('mean price of pvt room ->',df[df['room_type']=='Private room']['price'].mean())
print('mean price of shared room ->',df[df['room_type']=='Shared room']['price'].mean
())
print('mean price of Entire home/apt room ->',df[df['room_type']=='Entire home/apt']['p
rice'].mean())
```

```
mean price of pvt room -> 89.78097285675894
mean price of shared room -> 70.12758620689655
mean price of Entire home/apt room -> 211.79424613325986
```

In [40]:

```
print('mean minimum_nights of pvt room ->',df[df['room_type']=='Private room']['minimum
_nights'].mean())
print('mean minimum_nights of shared room ->',df[df['room_type']=='Shared room']['minim
um_nights'].mean())
print('mean minimum_nights of Entire home/apt room ->',df[df['room_type']=='Entire hom
e/apt']['minimum_nights'].mean())
```

```
mean minimum_nights of pvt room -> 5.377900206037803
mean minimum_nights of shared room -> 6.475
mean minimum_nights of Entire home/apt room -> 8.506907001456177
```

In [49]:

```
r=[]
for i in df['room_type']:
    if i=='Private room':
        r.append(1)
    elif i=='Shared room':
        r.append(0)
    else:
        r.append(2)
df['room']=r
```

Out[49]:

```
2    25409
1    22326
0     1160
Name: room, dtype: int64
```

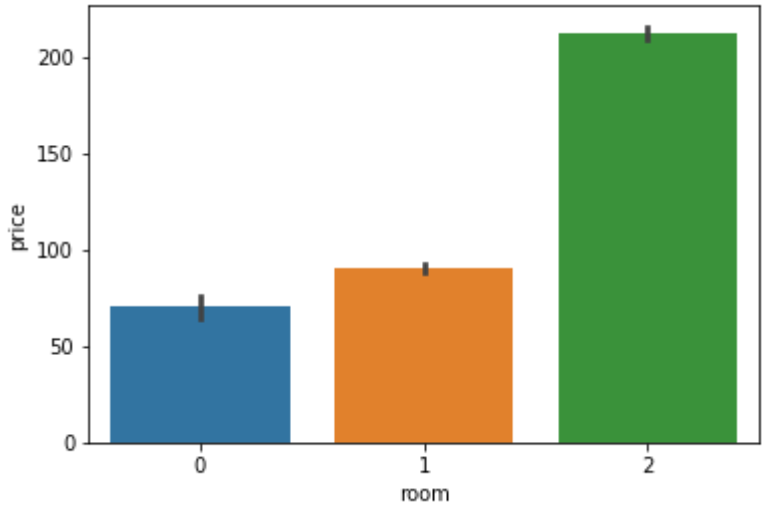
Price of shared app/ house are more

In [57]:

```
sns.barplot(y='price',x='room',data=df)
```

Out[57]:

```
<matplotlib.axes._subplots.AxesSubplot at 0x298fc35e080>
```

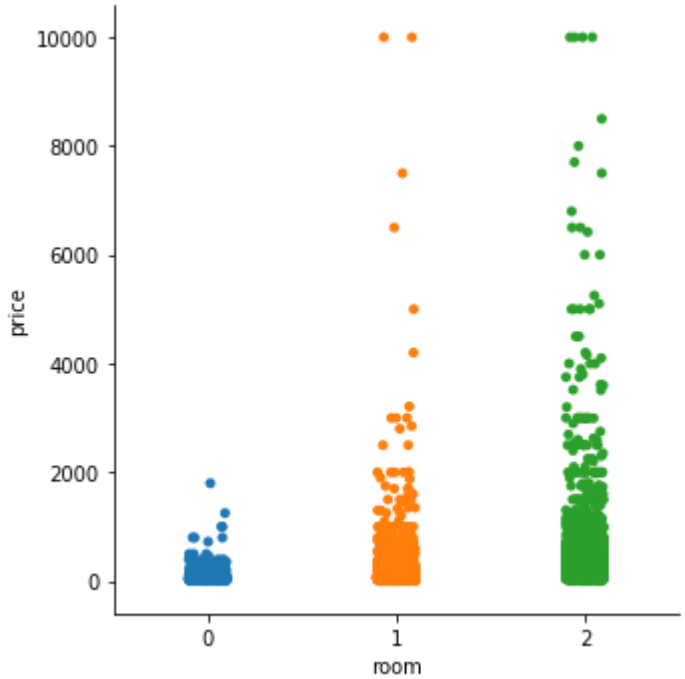


In [58]:

```
sns.catplot(y='price',x='room',data=df)
```

Out[58]:

```
<seaborn.axisgrid.FacetGrid at 0x298fc30b198>
```



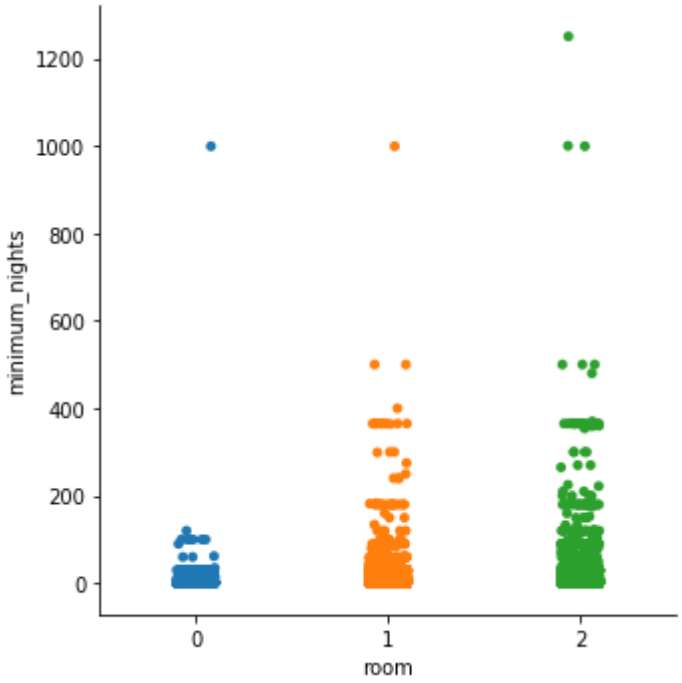
STAY IN ROOMS ARE ROUGHLY DIRECTLY PROPORTIONAL TO THEIR TYPES

In [64]:

```
sns.catplot(y='minimum_nights',x='room',data=df)
```

Out[64]:

```
<seaborn.axisgrid.FacetGrid at 0x298fc4a3898>
```

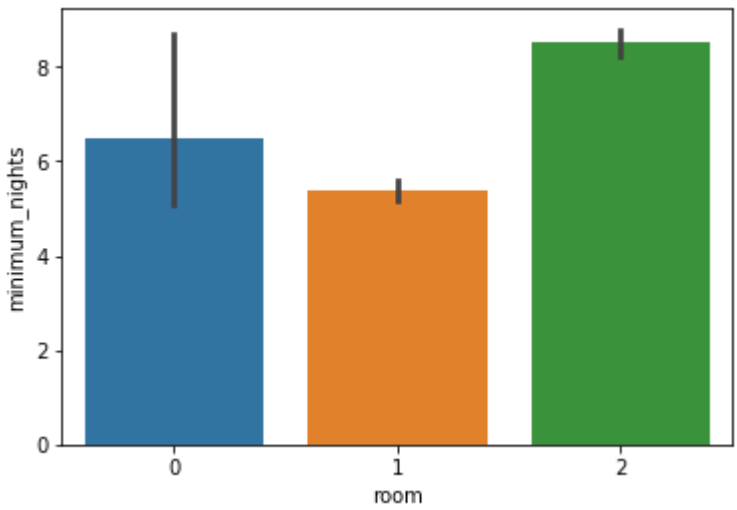


In [139]:

```
sns.barplot(y='minimum_nights',x='room',data=df)
```

Out[139]:

```
<matplotlib.axes._subplots.AxesSubplot at 0x29884b65c18>
```



INCLUDING AREAS

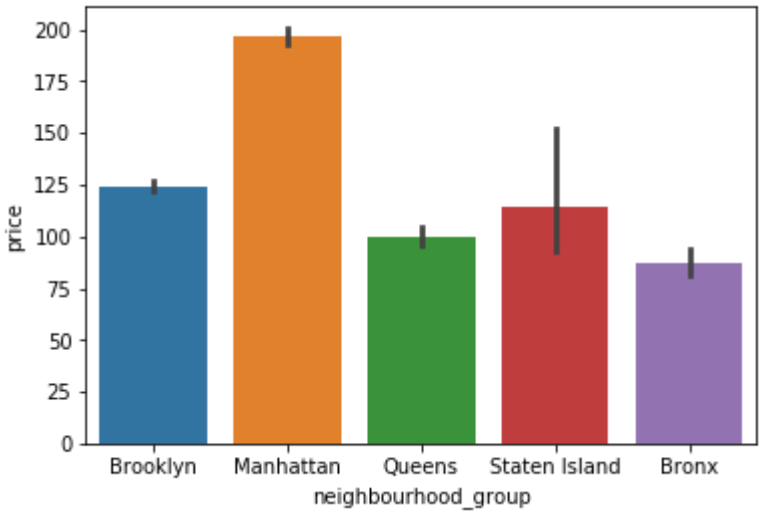
let's see the graphs

In [99]:

```
sns.barplot(y='price',x='neighbourhood_group',data=df)
```

Out[99]:

```
<matplotlib.axes._subplots.AxesSubplot at 0x298fa300080>
```

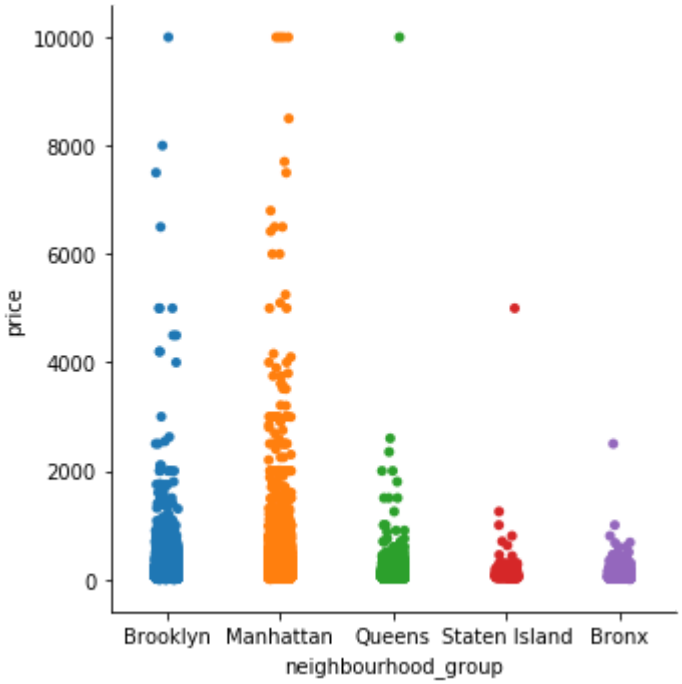


In [107]:

```
sns.catplot(y='price',x='neighbourhood_group',data=df)
```

Out[107]:

```
<seaborn.axisgrid.FacetGrid at 0x29883ec63c8>
```



In [162]:

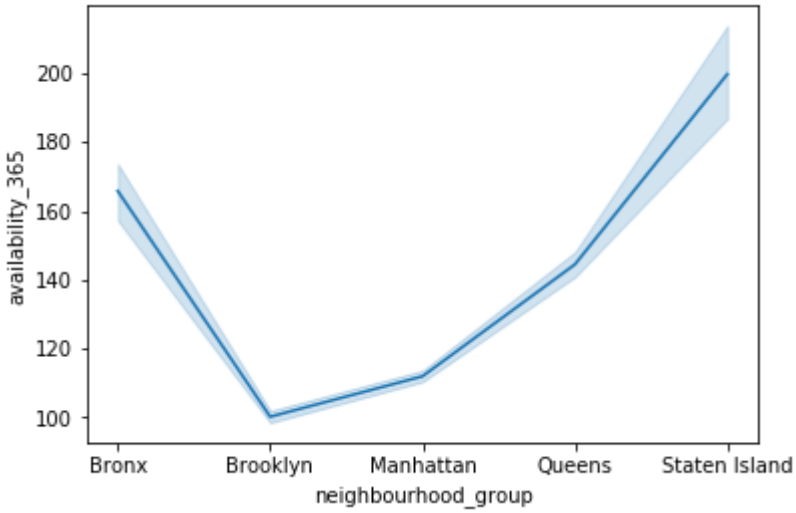
```
df=df.fillna(0)
```

In [110]:

```
sns.lineplot(y='availability_365',x='neighbourhood_group',data=df)
```

Out[110]:

```
<matplotlib.axes._subplots.AxesSubplot at 0x29883aceeb8>
```



In [117]:

```
df.neighbourhood_group.value_counts().reset_index(name='room')
```

Out[117]:

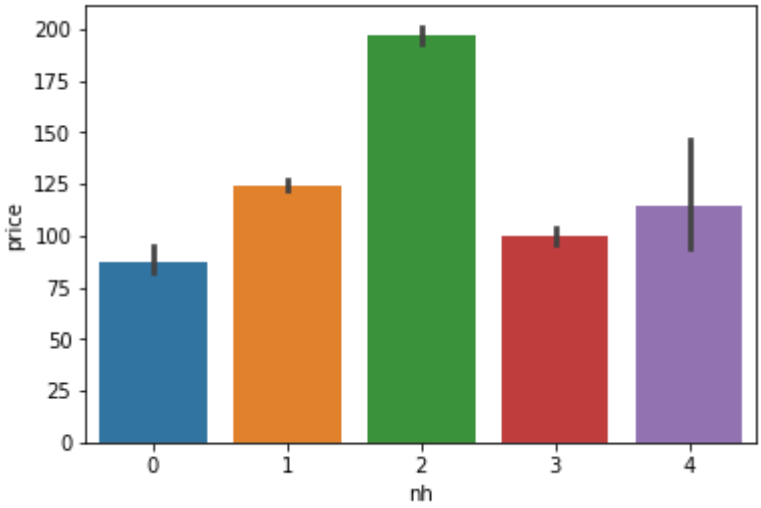
	index	room
0	Manhattan	21661
1	Brooklyn	20104
2	Queens	5666
3	Bronx	1091
4	Staten Island	373

In [155]:

```
sns.barplot(x='nh',y='price',data=df)
```

Out[155]:

```
<matplotlib.axes._subplots.AxesSubplot at 0x29892d24b38>
```



In [ ]:

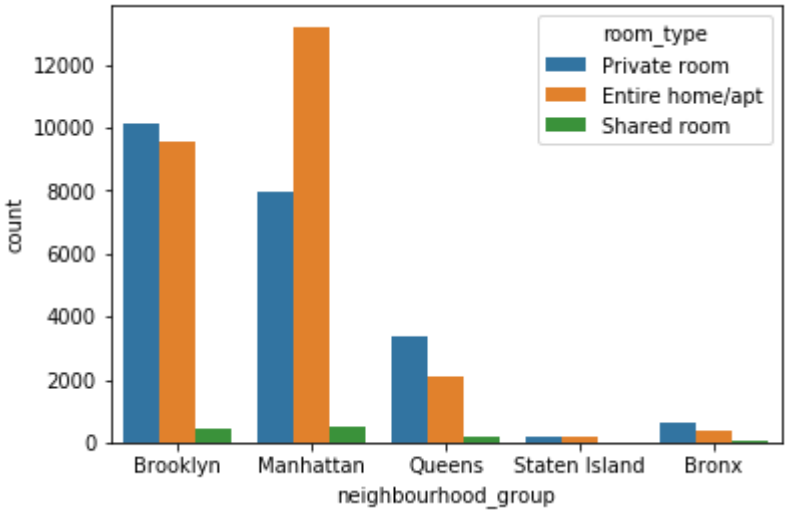
```

```

In [121]:

```
sns.countplot(x="neighbourhood_group", hue="room_type", data=df)
```

Out[121]:

```
<matplotlib.axes._subplots.AxesSubplot at 0x2988450f860>
```



CONCLUSION

1. MOST EARNING AREA IS MANHATTAN WITH HIGHEST OF ENTIRE APT

2. WITH LOW PRICE AND HIGH AVAILABILITY IN STATEN ISLAND IT'S NOT

A FAVOURITE LOCATION FOR SOME REASON

3. FOR PRIVATE ROOM BROOKLYN SEEMS THE BEST BECAUSE OF THEIR LEAST AVAILIBILITY AND HIGHER PRICES THAN MANHATTAN PVT ROOMS

GEOGRAPHICAL ANALYSIS

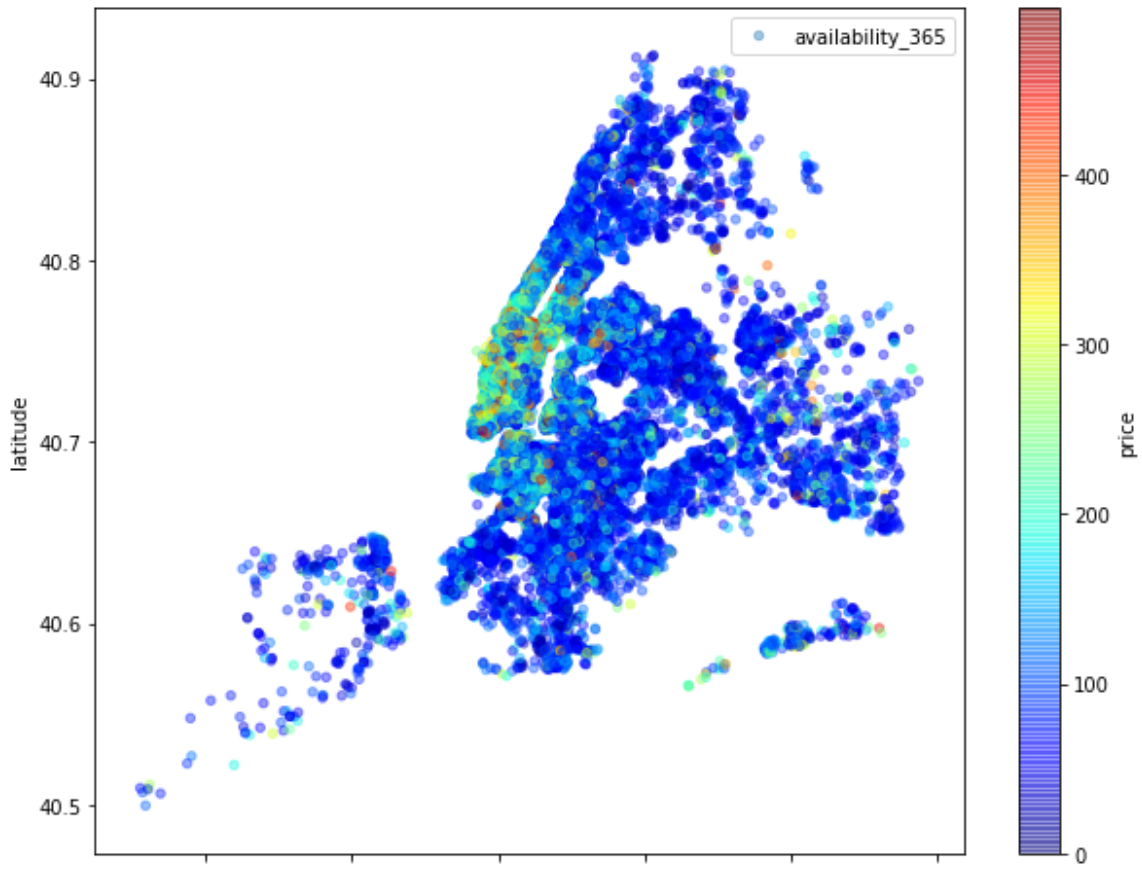
REMOVING ROOMS OF EXTREME PRICES FOR A CLEAR VIEW

In [190]:

```
sub=df[df.price < 500]
v=sub.plot(kind='scatter', x='longitude', y='latitude', label='availability_365', c='price',
                   cmap=plt.get_cmap('jet'), colorbar=True, alpha=0.4, figsize=(10,8))
v.legend()
```

Out[190]:

```
<matplotlib.legend.Legend at 0x298b70fc898>
```

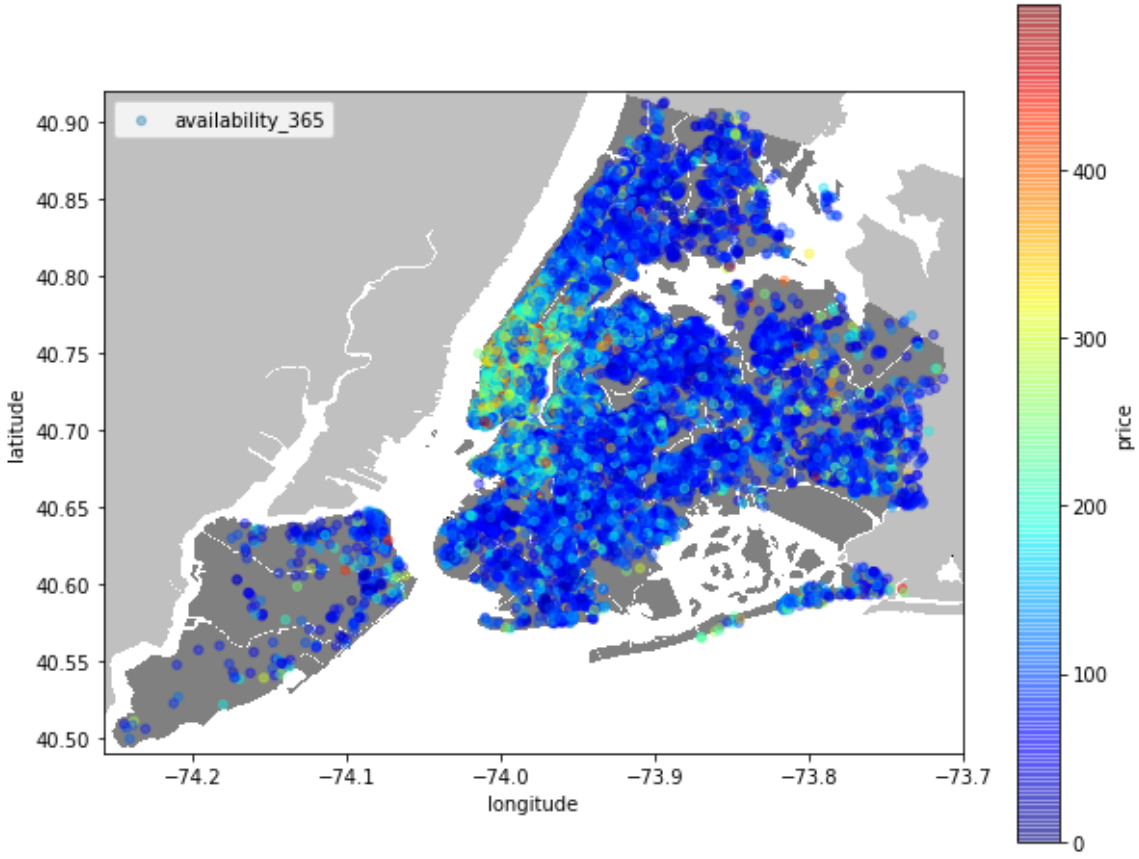


CLEARLY QUEENS WITH LESS NUMBER OF ROOMS IS THE MOST

EXPENSIVE

In [183]:

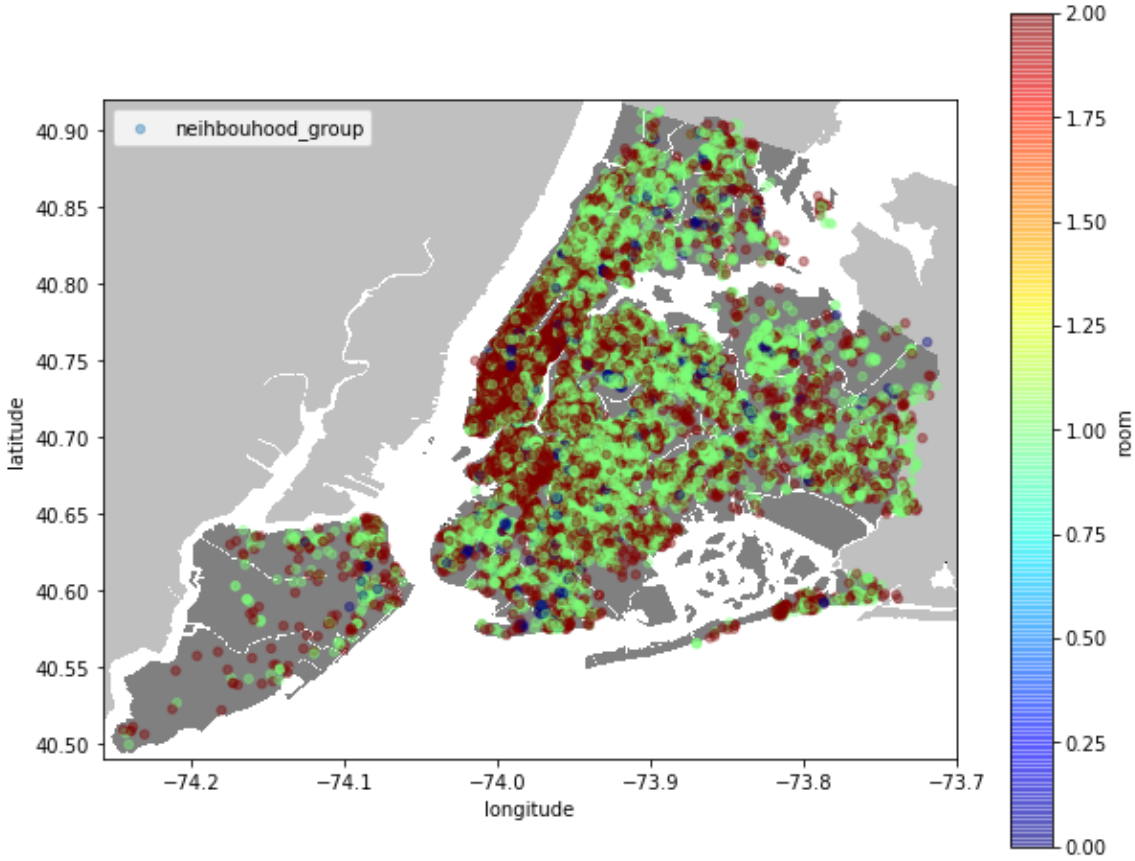
```
import urllib
#initializing the figure size
plt.figure(figsize=(10,8))
#loading the png NYC image found on Google and saving to my local folder along with the
project
i=urllib.request.urlopen('https://upload.wikimedia.org/wikipedia/commons/e/ec/Neighbour
hoods_New_York_City_Map.PNG')
nyc_img=plt.imread(i)
#scaling the image based on the latitude and longitude max and mins for proper output
plt.imshow(nyc_img,zorder=0,extent=[-74.258, -73.7, 40.49,40.92])
ax=plt.gca()
#using scatterplot again
sub.plot(kind='scatter', x='longitude', y='latitude', label='availability_365', c='pric
e', ax=ax,
           cmap=plt.get_cmap('jet'), colorbar=True, alpha=0.4, zorder=5)
plt.legend()
plt.show()
```



QUEENS HAS REASONABLY LARGE AMOUNT OF ENTIRE APT

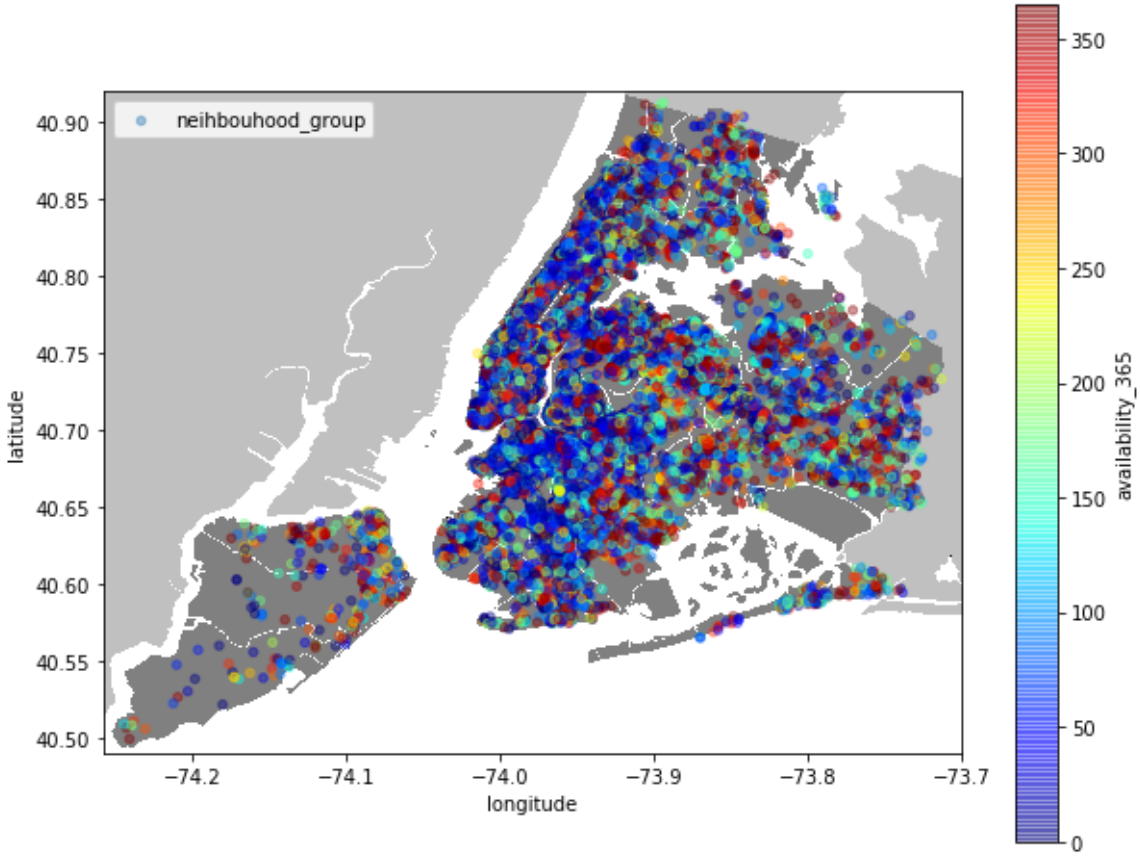
In [191]:

```
import urllib
#initializing the figure size
plt.figure(figsize=(10,8))
#loading the png NYC image found on Google and saving to my local folder along with the
project
i=urllib.request.urlopen('https://upload.wikimedia.org/wikipedia/commons/e/ec/Neighbour
hoods_New_York_City_Map.PNG')
nyc_img=plt.imread(i)
#scaling the image based on the latitude and longitude max and mins for proper output
plt.imshow(nyc_img,zorder=0,extent=[-74.258, -73.7, 40.49,40.92])
ax=plt.gca()
#using scatterplot again
sub.plot(kind='scatter', x='longitude', y='latitude', label='neihbouhood_group', c='roo
m', ax=ax,
           cmap=plt.get_cmap('jet'), colorbar=True, alpha=0.4, zorder=5)
plt.legend()
plt.show()
```



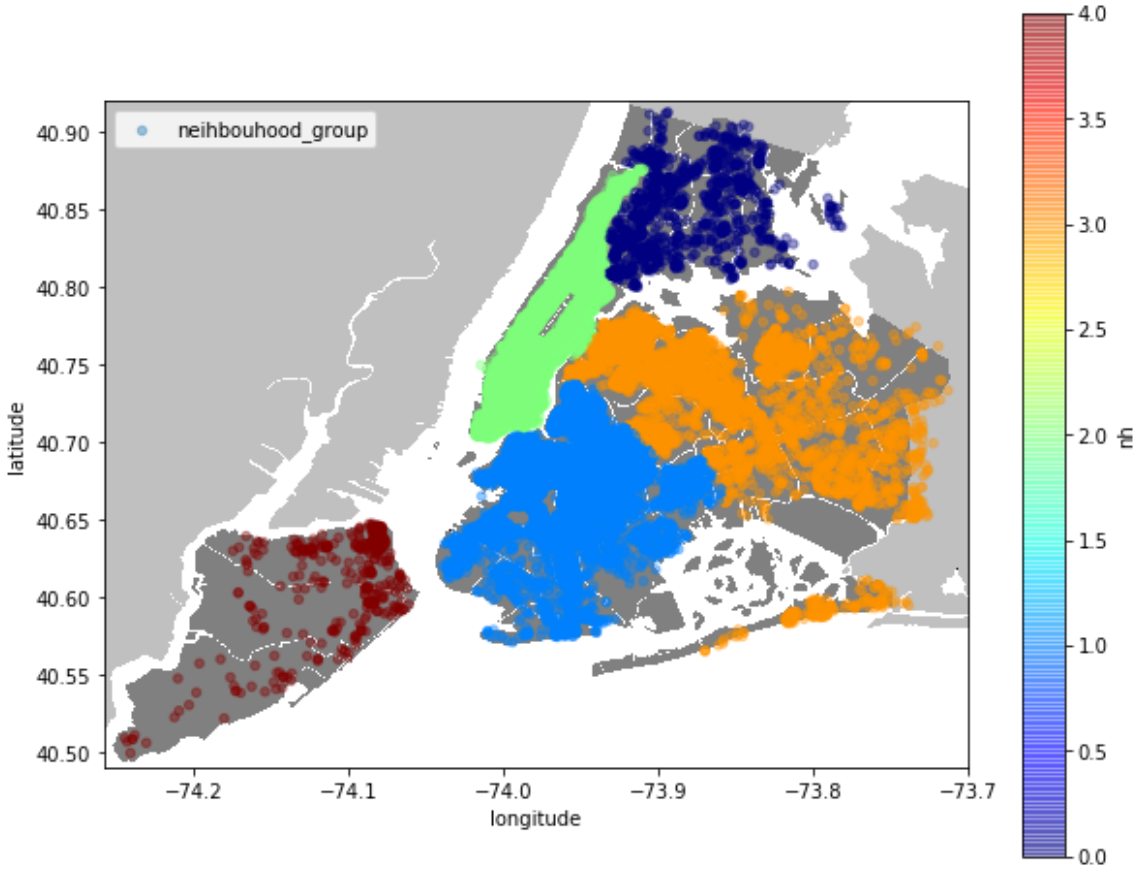
In [197]:

```
import urllib
#initializing the figure size
plt.figure(figsize=(10,8))
#loading the png NYC image found on Google and saving to my local folder along with the
project
i=urllib.request.urlopen('https://upload.wikimedia.org/wikipedia/commons/e/ec/Neighbour
hoods_New_York_City_Map.PNG')
nyc_img=plt.imread(i)
#scaling the image based on the latitude and longitude max and mins for proper output
plt.imshow(nyc_img,zorder=0,extent=[-74.258, -73.7, 40.49,40.92])
ax=plt.gca()
#using scatterplot again
df.plot(kind='scatter', x='longitude', y='latitude', label='neihbouhood_group', c='avai
lability_365', ax=ax,
           cmap=plt.get_cmap('jet'), colorbar=True, alpha=0.4, zorder=5)
plt.legend()
plt.show()
```



In [193]:

```
import urllib
#initializing the figure size
plt.figure(figsize=(10,8))
#loading the png NYC image found on Google and saving to my local folder along with the
project
i=urllib.request.urlopen('https://upload.wikimedia.org/wikipedia/commons/e/ec/Neighbour
hoods_New_York_City_Map.PNG')
nyc_img=plt.imread(i)
#scaling the image based on the latitude and longitude max and mins for proper output
plt.imshow(nyc_img,zorder=0,extent=[-74.258, -73.7, 40.49,40.92])
ax=plt.gca()
#using scatterplot again
df.plot(kind='scatter', x='longitude', y='latitude', label='neihbouhood_group', c='nh',
ax=ax,
            cmap=plt.get_cmap('jet'), colorbar=True, alpha=0.4, zorder=5)
plt.legend()
plt.show()
```



In [196]:

```
df['host_id'].value_counts().head()
```

Out[196]:

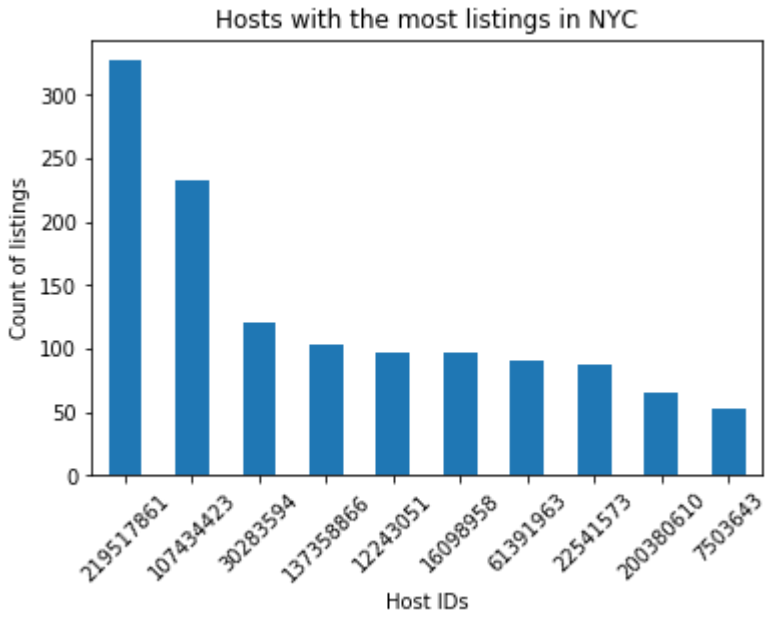
```
219517861    327
107434423    232
30283594     121
137358866    103
12243051      96
Name: host_id, dtype: int64
```

In [195]:

```
top_host=df.host_id.value_counts().head(10)
host=top_host.plot(kind='bar')
host.set_title('Hosts with the most listings in NYC')
host.set_ylabel('Count of listings')
host.set_xlabel('Host IDs')
host.set_xticklabels(viz_1.get_xticklabels(), rotation=45)
```

Out[195]:

```
[Text(0, 0, '219517861'),
 Text(0, 0, '107434423'),
 Text(0, 0, '30283594'),
 Text(0, 0, '137358866'),
 Text(0, 0, '12243051'),
 Text(0, 0, '16098958'),
 Text(0, 0, '61391963'),
 Text(0, 0, '22541573'),
 Text(0, 0, '200380610'),
 Text(0, 0, '7503643')]
```



In [ ]:

In [ ]: