

```

import pandas as pd
import numpy as np
import matplotlib.pyplot as plt

dataMon=pd.read_csv('monday.csv')
dataTue=pd.read_csv('tuesday.csv')
dataWed=pd.read_csv('wednesday.csv')
dataThu=pd.read_csv('thursday.csv')
dataFri=pd.read_csv('friday.csv')
dataSat=pd.read_csv('saturday.csv')
dataSun=pd.read_csv('sunday.csv')

dataMonHourly=[]
for i in range(24):
    dataMonHourly.append(dataMon[dataMon['hour']==i])

dataMonHourly[11].X

660000    455.784065
660001    535.669175
660002    535.456550
660003    504.206616
660004    452.215803
...
719995    332.563700
719996    369.735029
719997    323.797573
719998    321.123925
719999    326.940130
Name: X, Length: 60000, dtype: float64

def PMF(RV):
    rvfreq=np.linspace(min(RV),max(RV),12)
    for i in range(1,len(rvfreq)):
        rv=[]
        rv=data[(RV>=rvfreq[i-1]) & (RV<=rvfreq[i])]
        Array_RV_freq.append(len(rv))
    return (Array_RV_freq,rvfreq)

rvfreq=[[] for i in range(24)]
Array_RV_freq=[[] for i in range(24)]
for i in range(24):

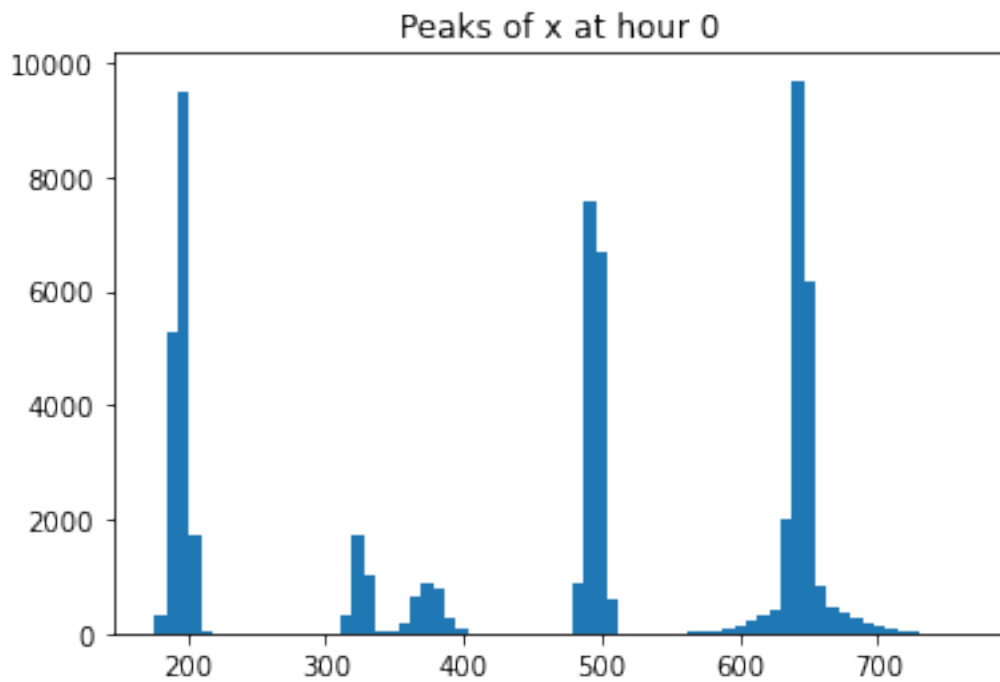
    rvfreq[i]=np.linspace(min(dataMonHourly[i].X),max(dataMonHourly[i].X),
12)
    for j in range(1,len(rvfreq[i])):
        rv=[]
        rv=dataMonHourly[i][(dataMonHourly[i].X >= rvfreq[i][j-1]) &
(dataMonHourly[i].X <= rvfreq[i][j])]
        Array_RV_freq[i].append(len(rv))

```

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counts,xbins,xbars=plt.hist(dataMonHourly[0].X,bins=70)
plt.title(f'Peaks of x at hour {0}')
plt.show()
print(np.argmax(counts))
print(dataMonHourly[0].X[55],dataMonHourly[0].Y[55])

```

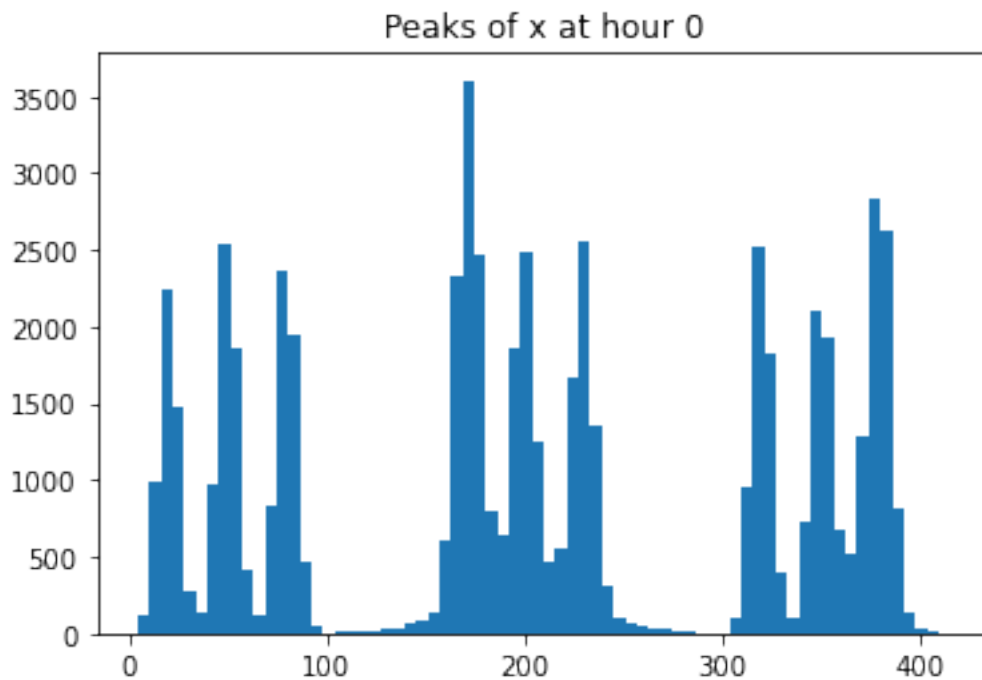


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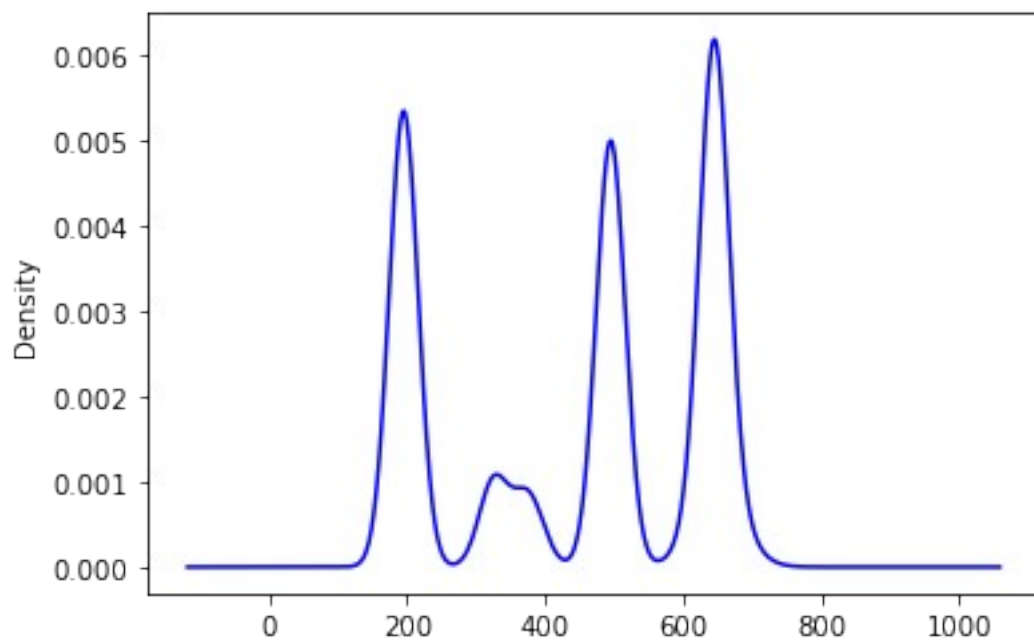
55
683.5114988030308 220.9190926099448

counts,xbins,xbars=plt.hist(dataMonHourly[0].Y,bins=70)
plt.title(f'Peaks of x at hour {0}')
plt.show()
print(np.argmax(counts))
print(dataMonHourly[0].Y[np.argmax(counts)],dataMonHourly[0].Y[55])

```



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28
238.19176676585832 220.9190926099448
dataMonHourly[0].X.plot.density(color='blue')
<AxesSubplot:ylabel='Density'>
```



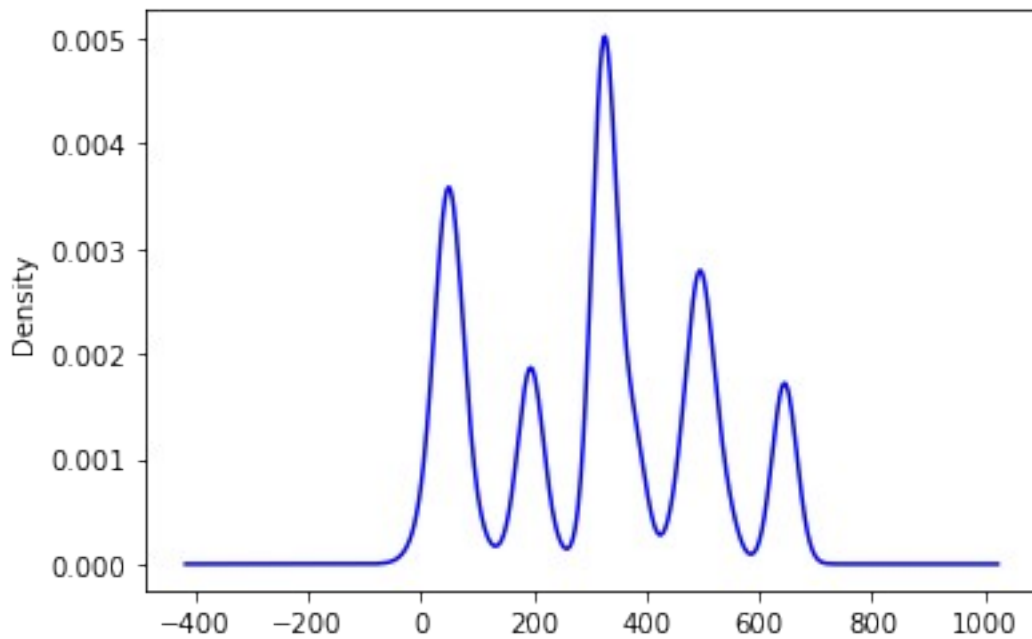
```
def Peaks(X):
    peaks=[]
```

```

    for i in range(1,len(X)-1):
        #if ( (X[i-1]<=X[i]) and (X[i]>=X[i+1]) ) and ( (Y[i-1]<=Y[i])
and (Y[i]>=Y[i+1]) ):
            if ( (X[i-1]<=X[i]) and (X[i]>=X[i+1]) ):
                # peaks.append((X[i],Y[i]))
                peaks.append(X[i])
    return peaks

dataMonHourly[11].X.plot.density(color='blue')
<AxesSubplot:ylabel='Density'>

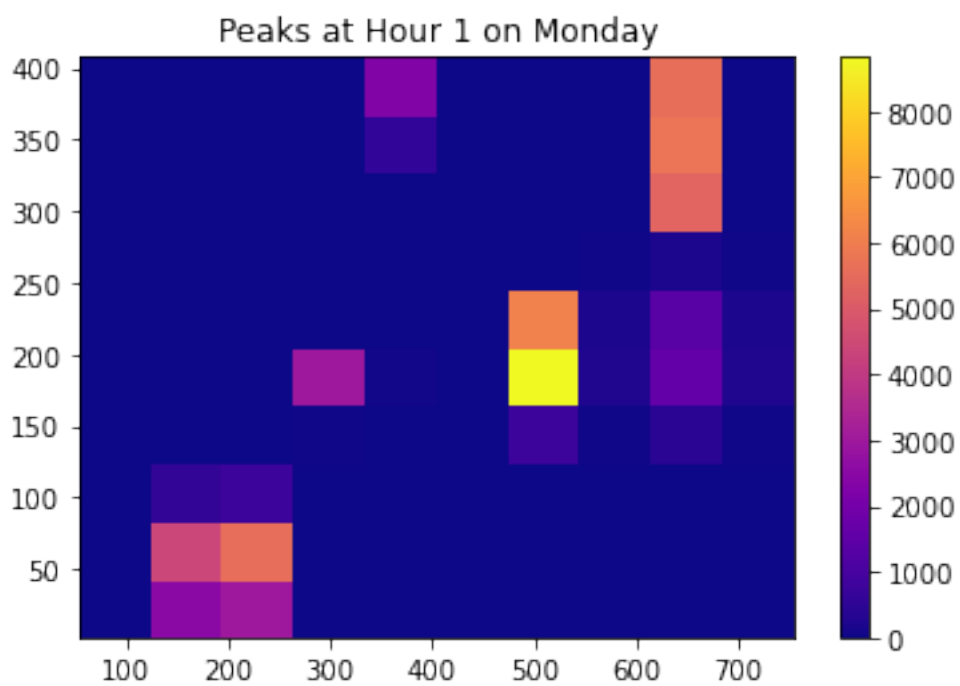
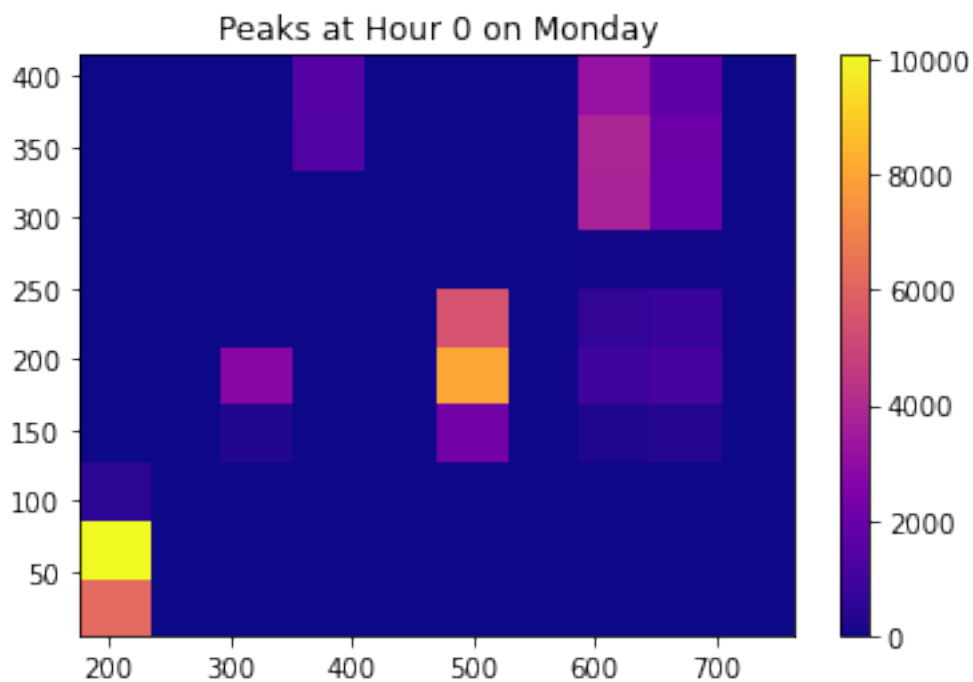
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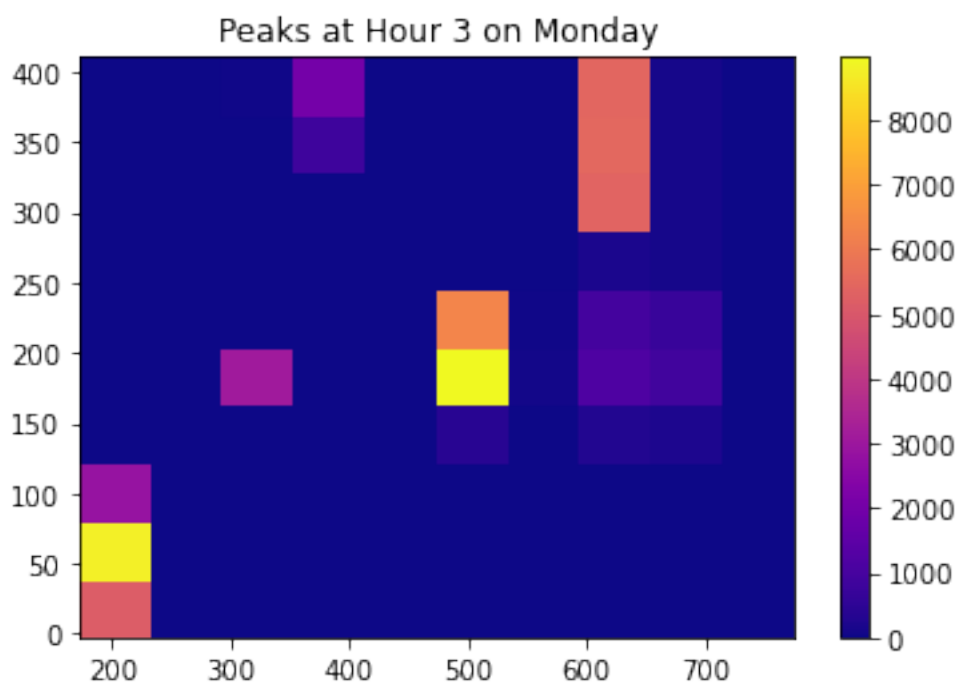
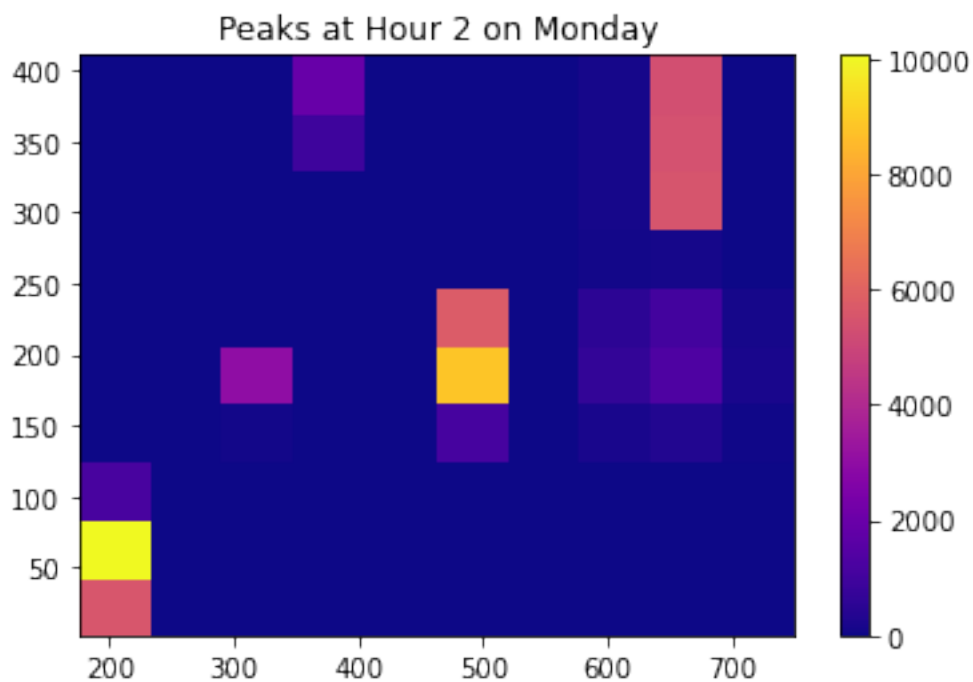


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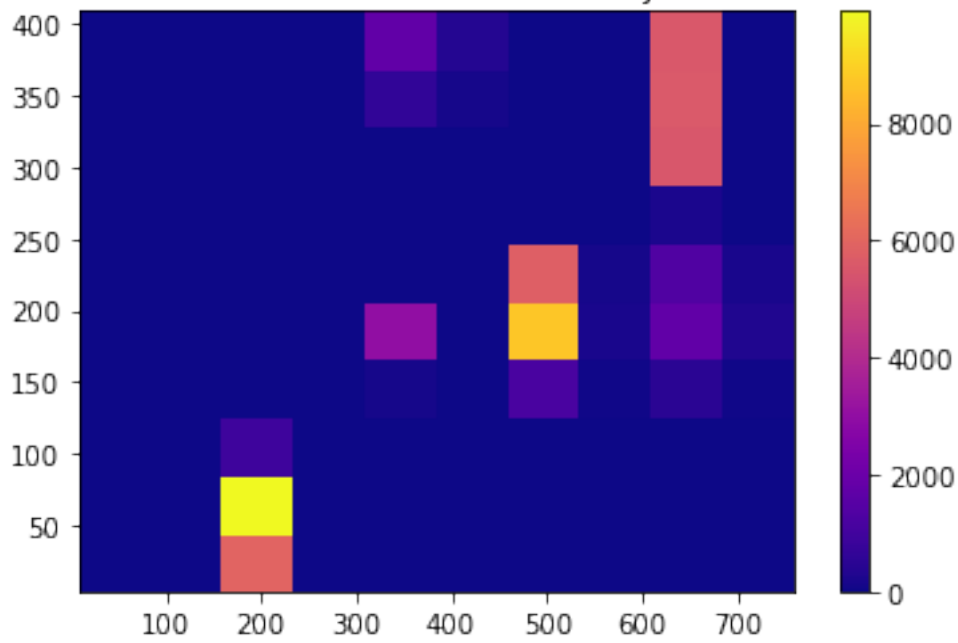
for i in range(24):
    plt.hist2d(dataMonHourly[i].X,dataMonHourly[i].Y,cmap=plt.cm.plasma)
    plt.title(f'Peaks at Hour {i} on Monday')
    plt.colorbar()
    plt.show()

```

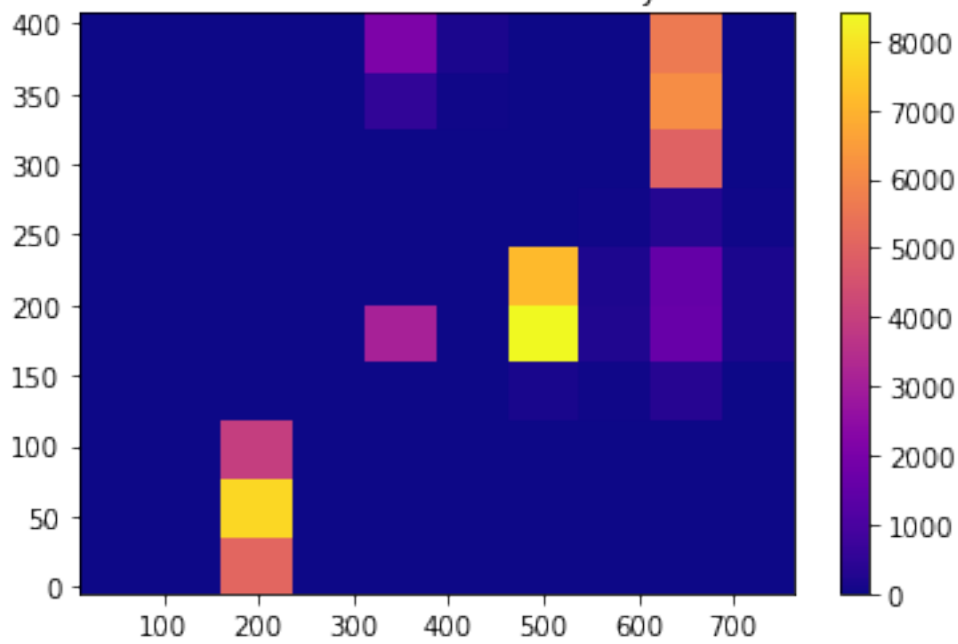




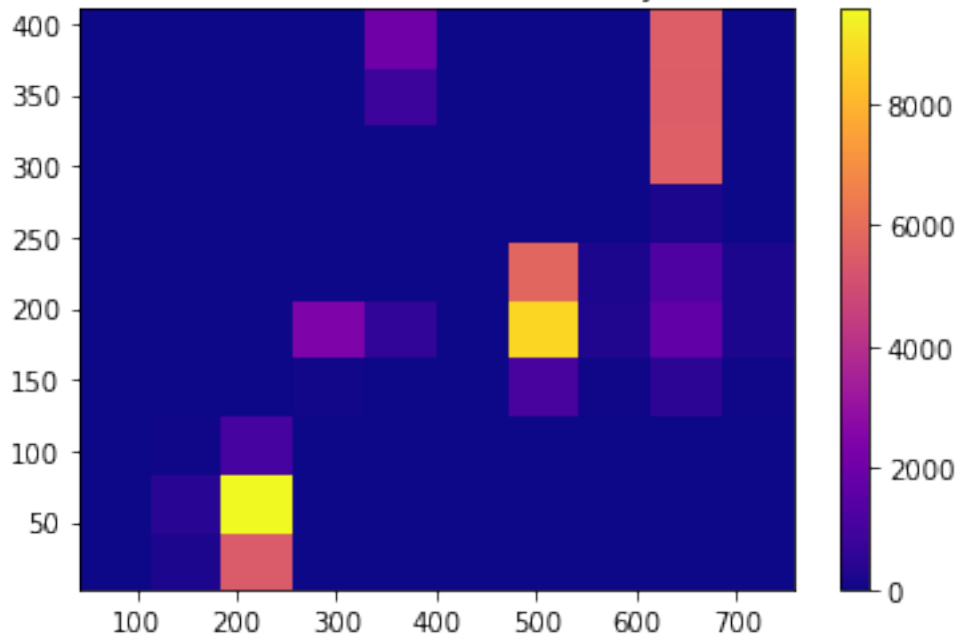
Peaks at Hour 4 on Monday



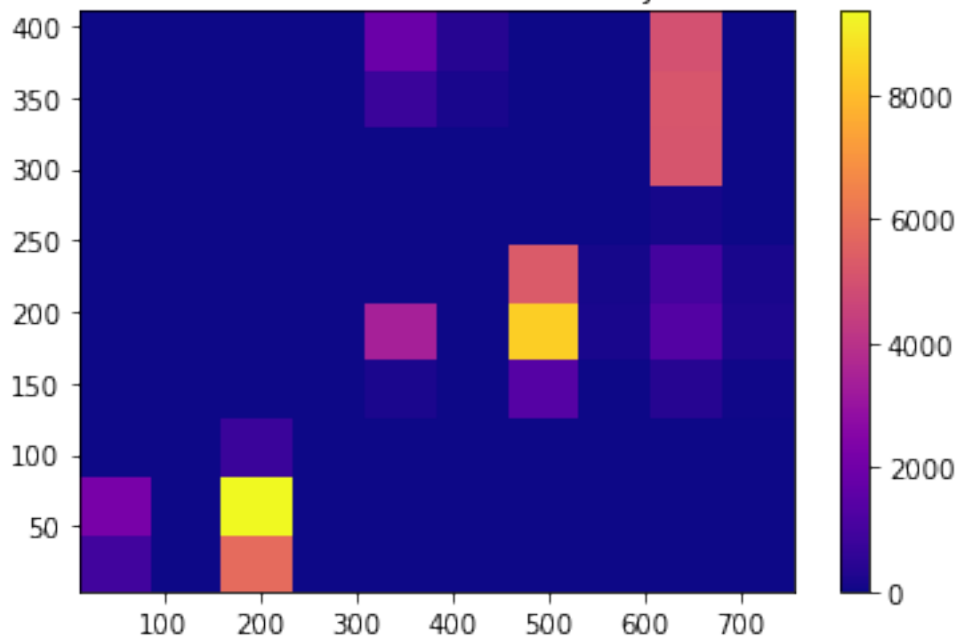
Peaks at Hour 5 on Monday



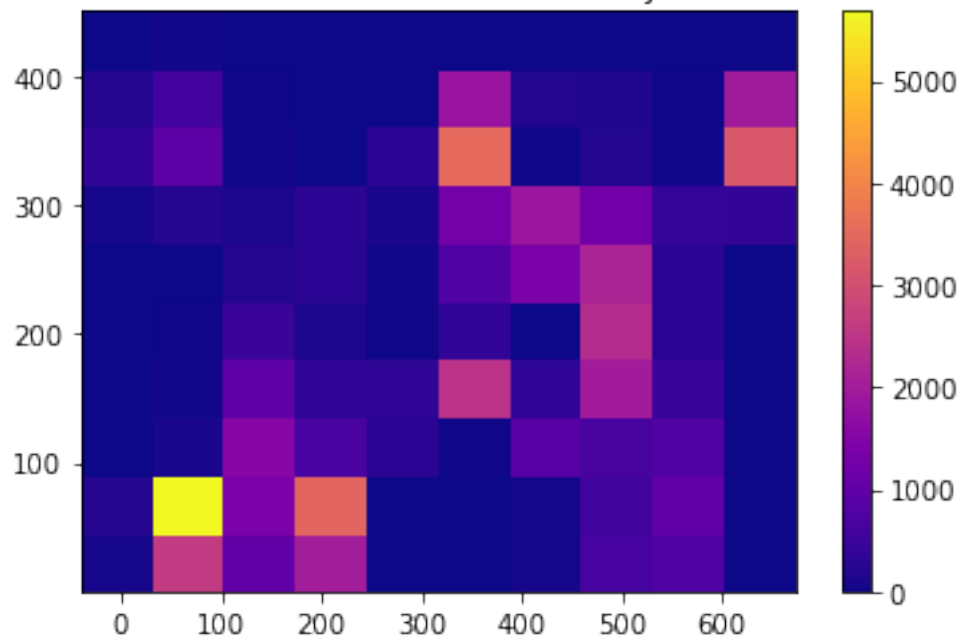
Peaks at Hour 6 on Monday



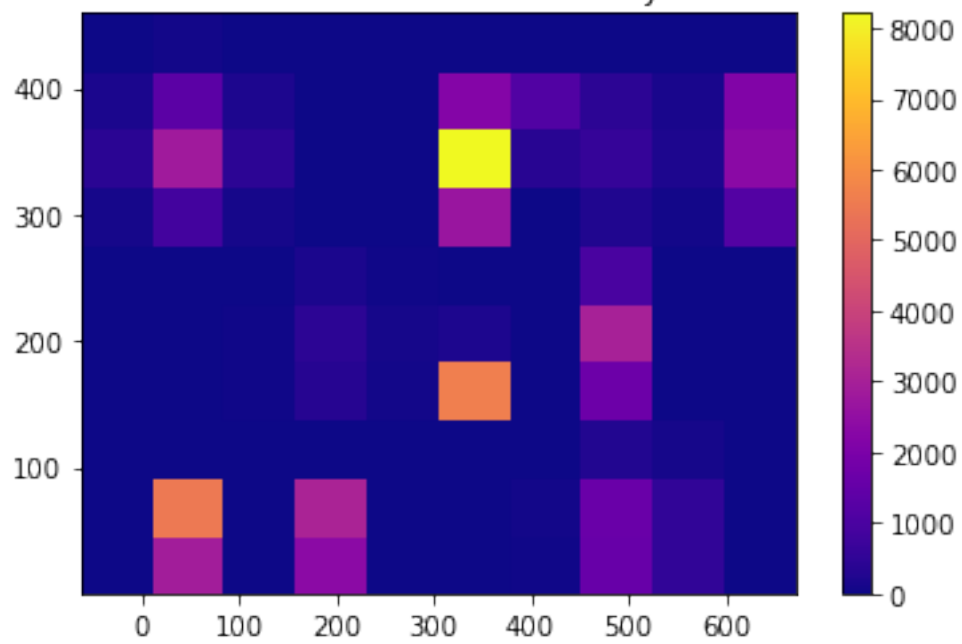
Peaks at Hour 7 on Monday



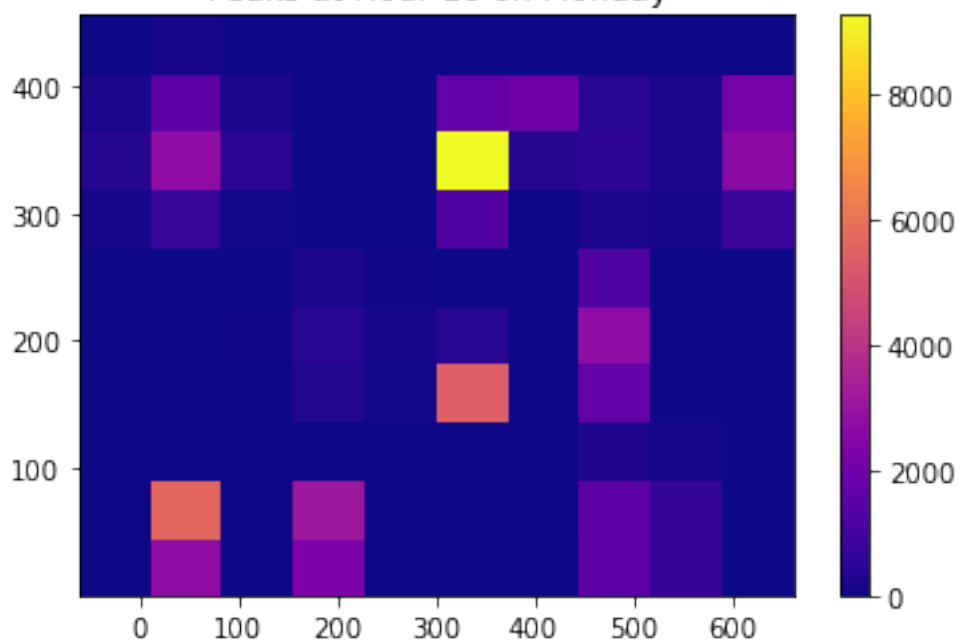
Peaks at Hour 8 on Monday



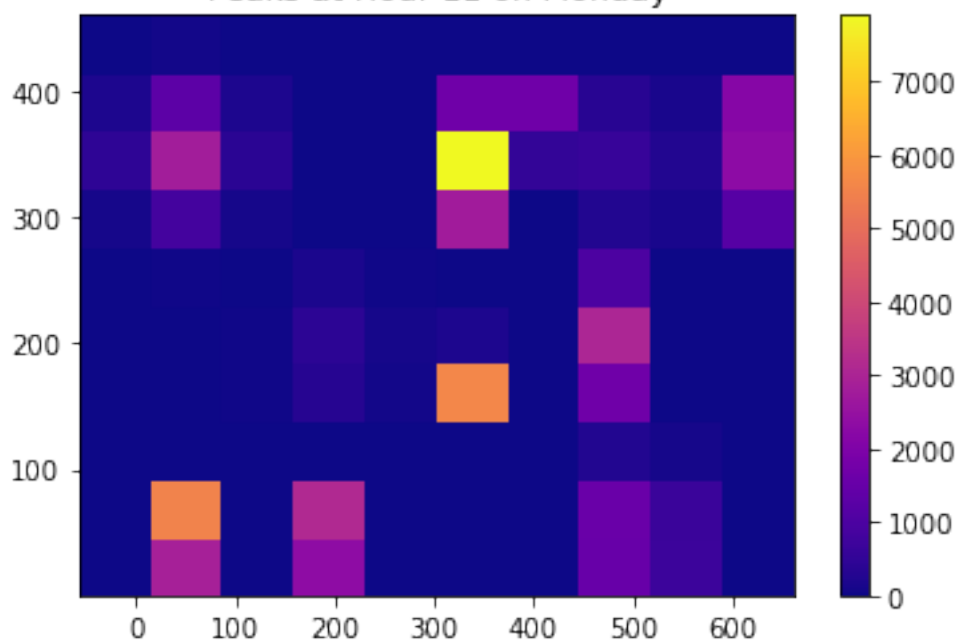
Peaks at Hour 9 on Monday

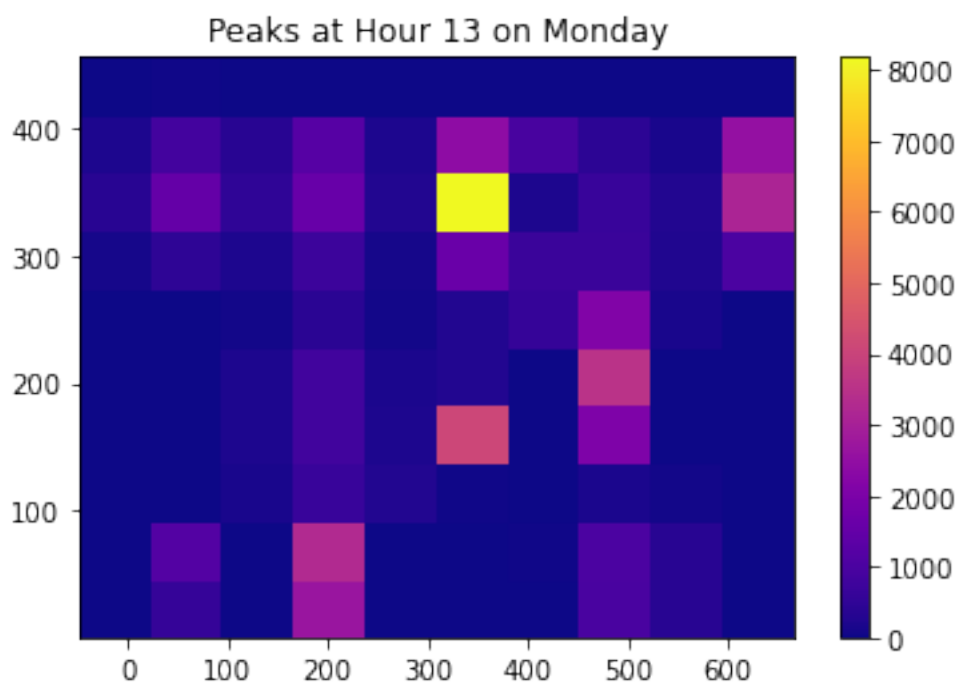
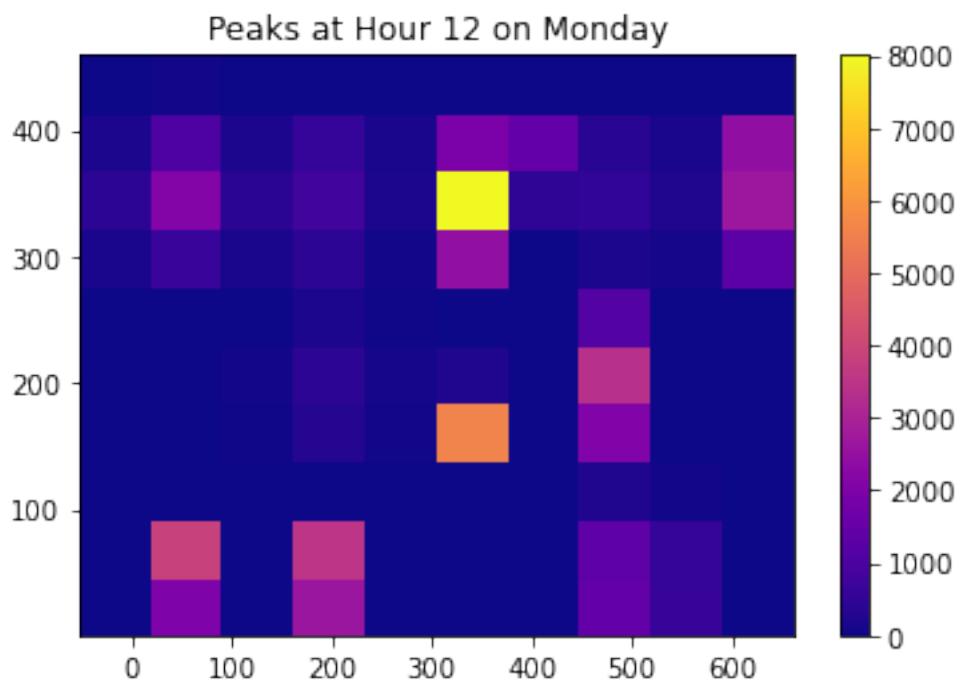


Peaks at Hour 10 on Monday

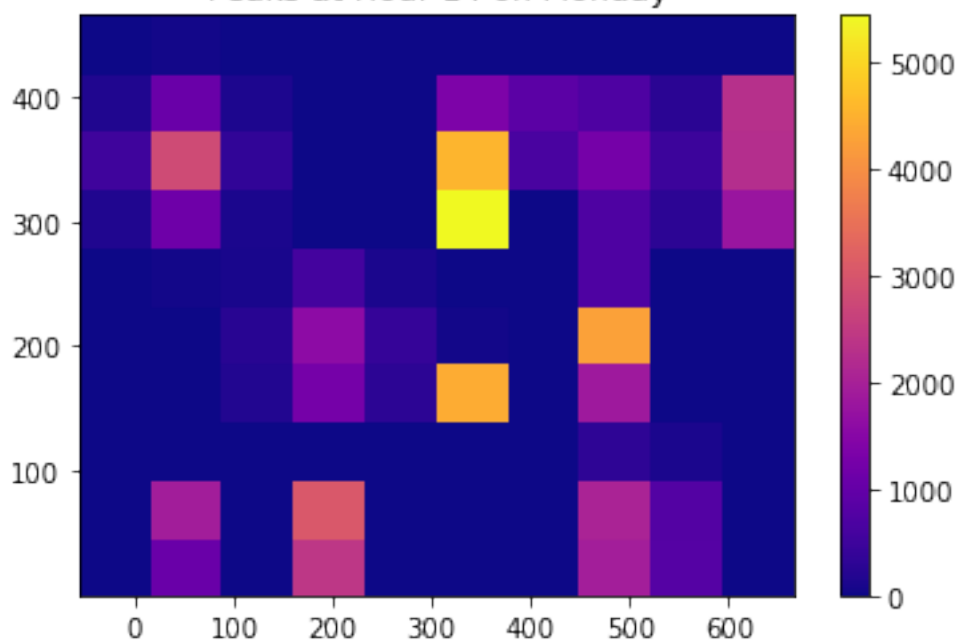


Peaks at Hour 11 on Monday

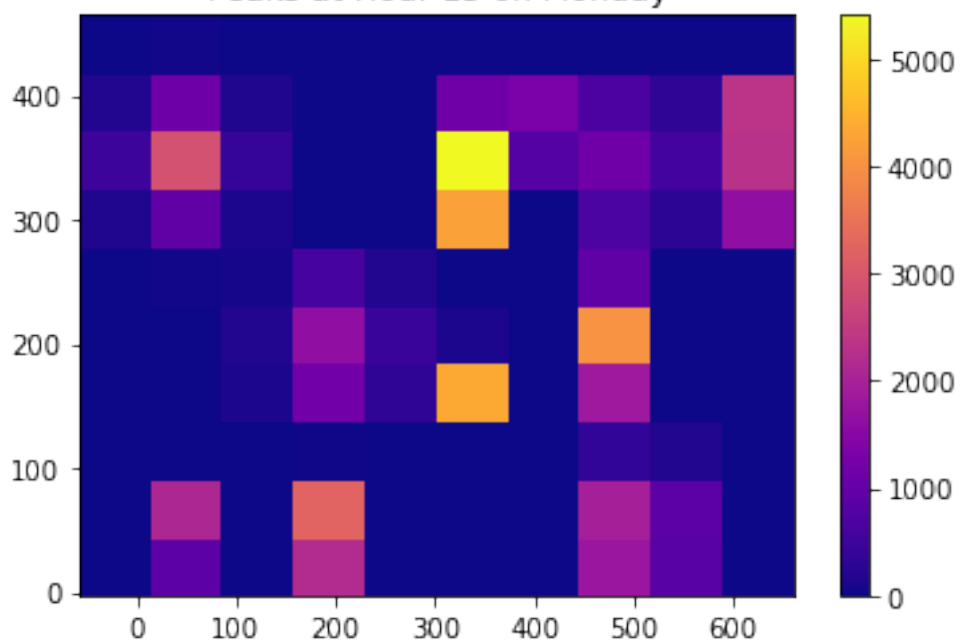




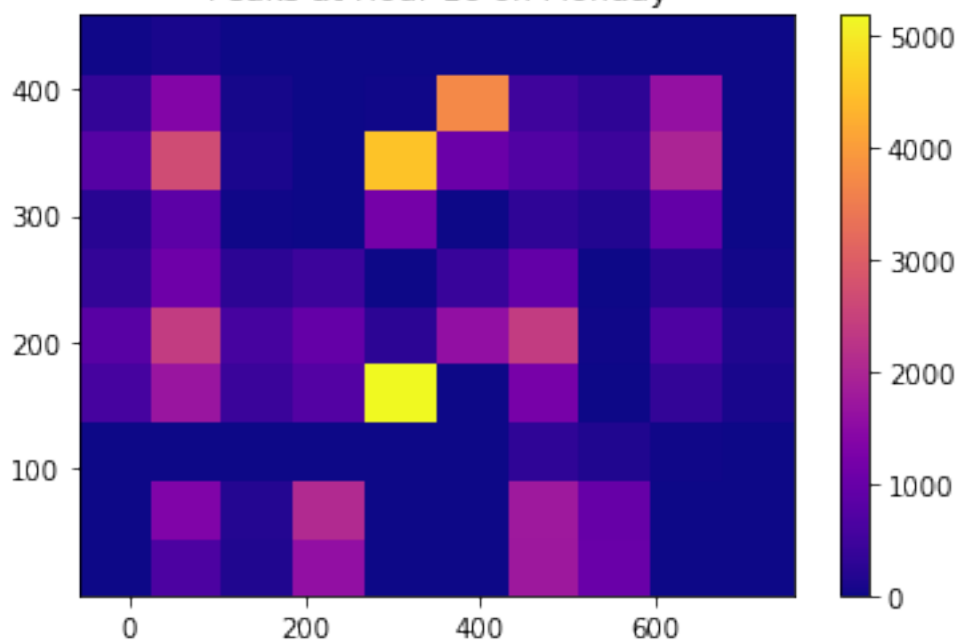
Peaks at Hour 14 on Monday



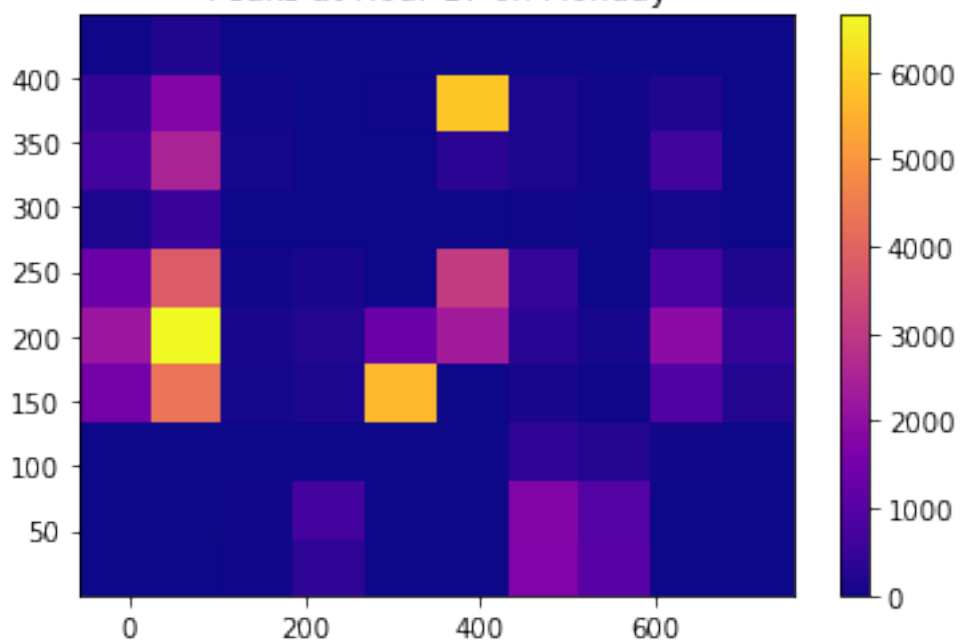
Peaks at Hour 15 on Monday



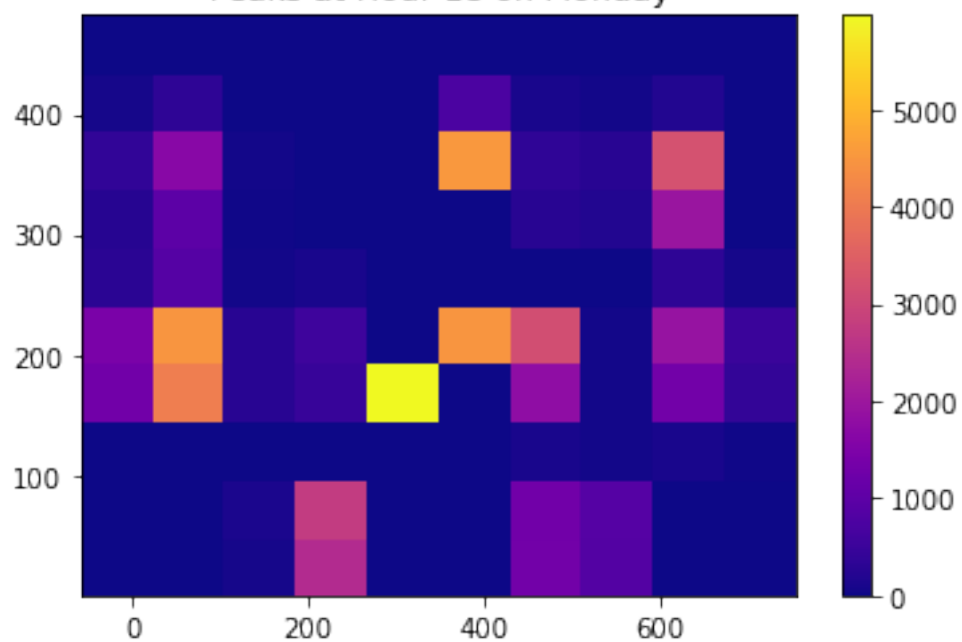
Peaks at Hour 16 on Monday



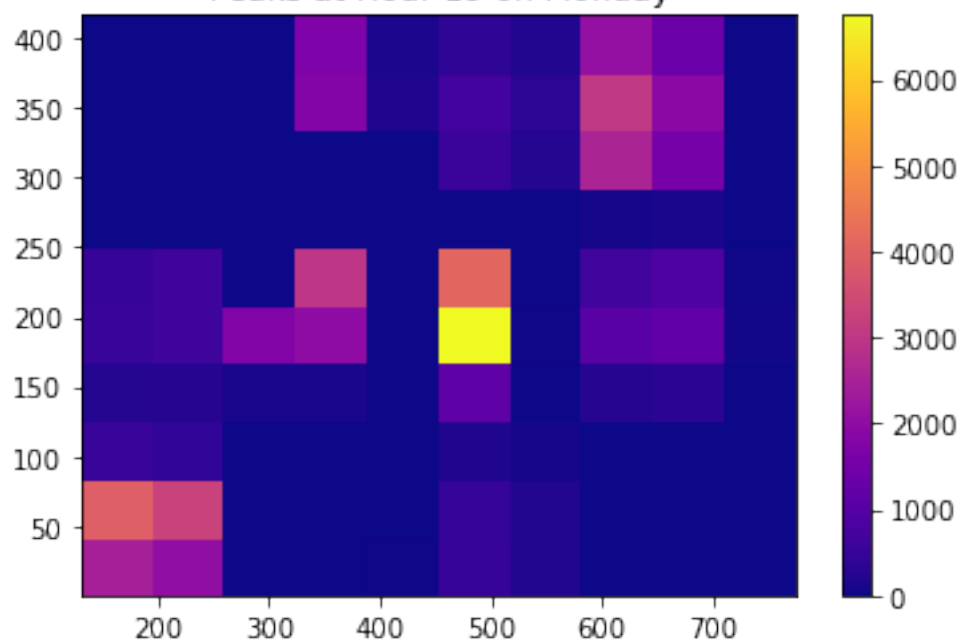
Peaks at Hour 17 on Monday

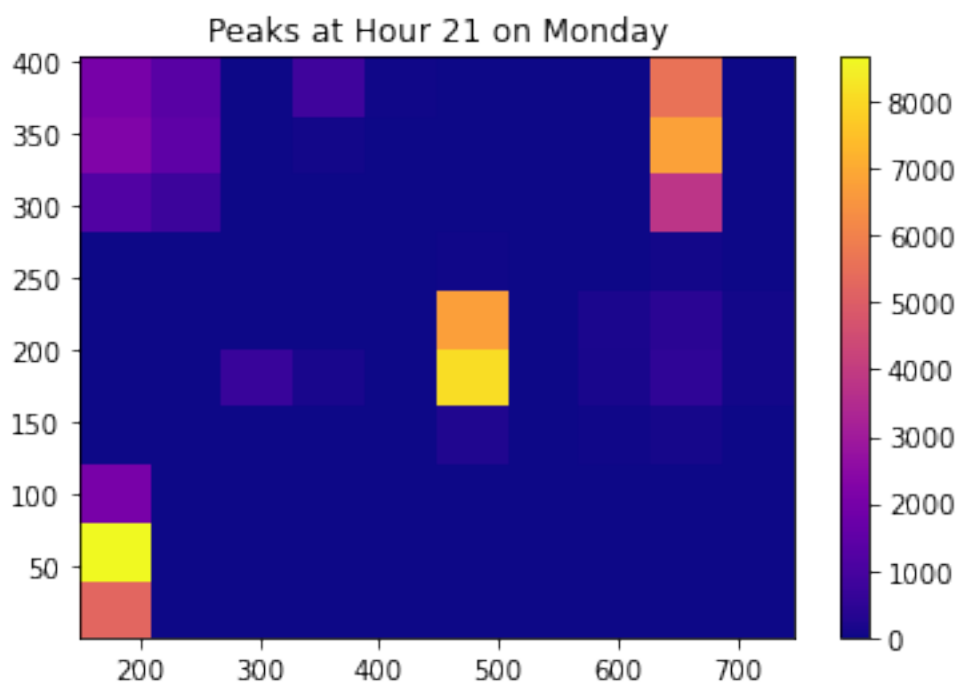
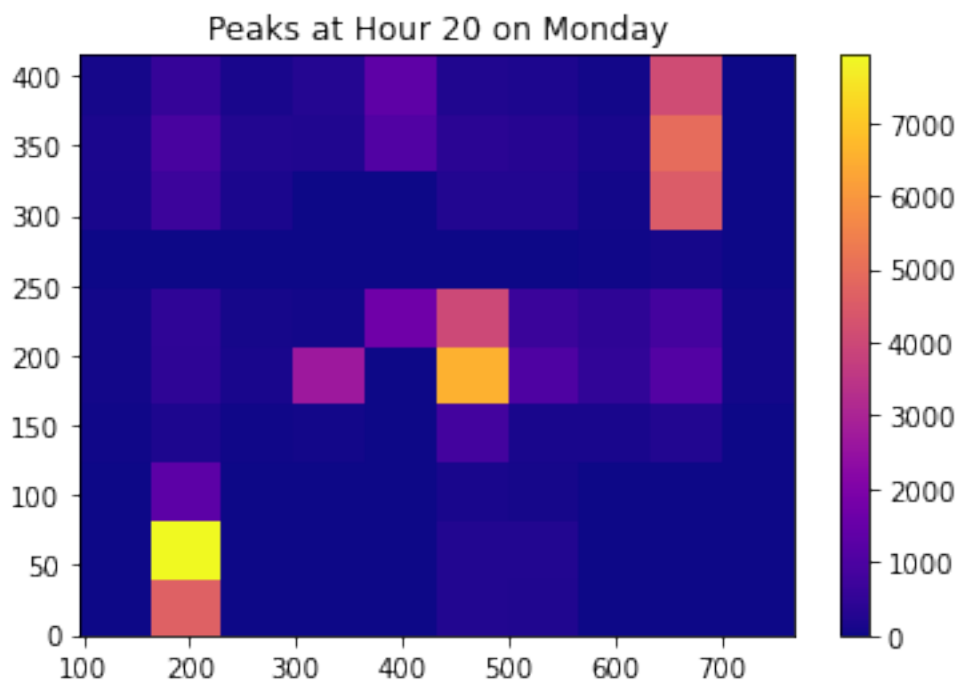


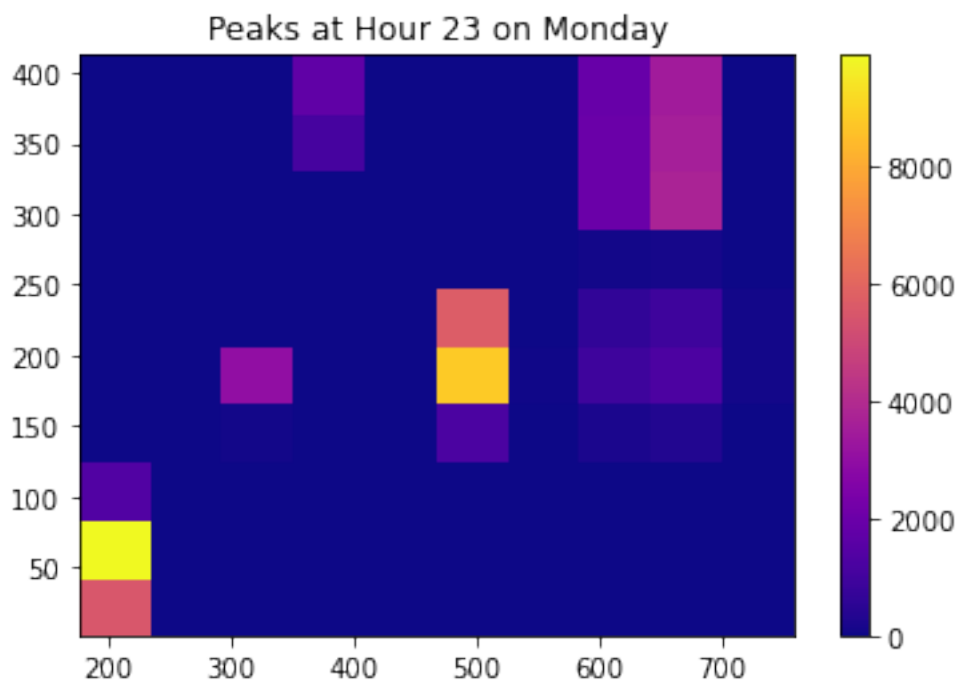
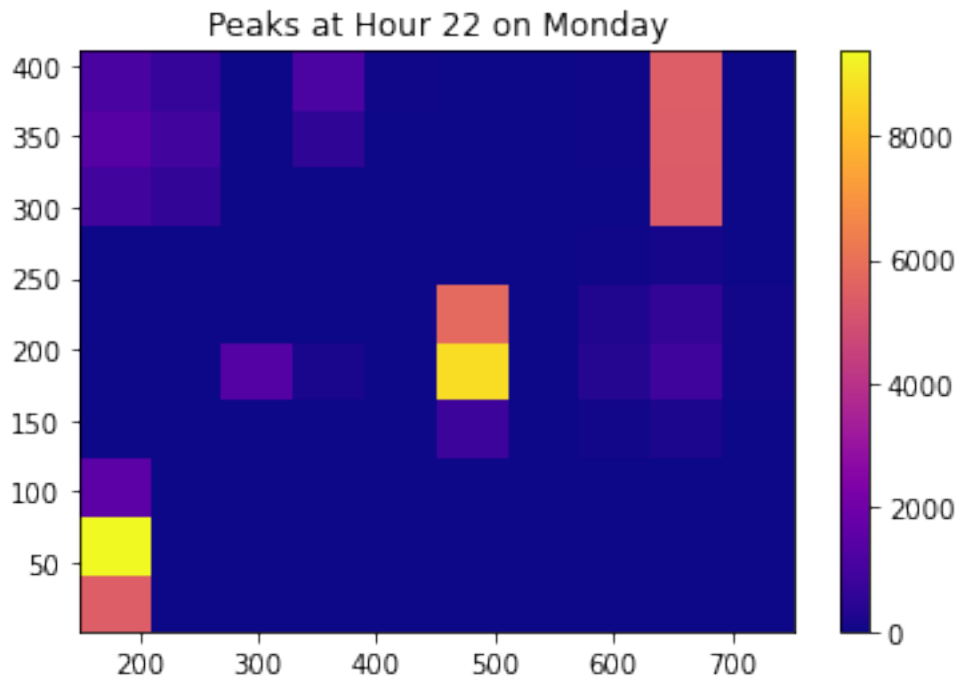
Peaks at Hour 18 on Monday



Peaks at Hour 19 on Monday







```
dataTueHourly=[]
for i in range(24):
    dataTueHourly.append(dataTue[dataTue['hour']==i])

def PMF(RV):
    rvfreq=np.linspace(min(RV),max(RV),12)
    for i in range(1,len(rvfreq)):
        rv=[]
```



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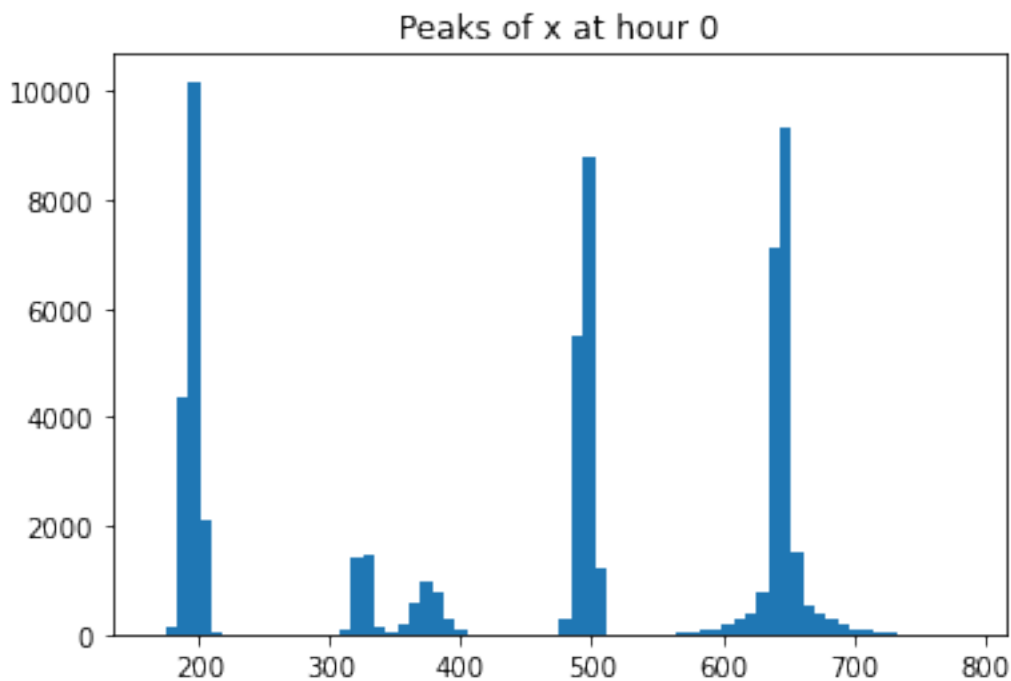
        rv=data[(RV>=rvfreq[i-1]) & (RV<=rvfreq[i])]
        Array_RV_freq.append(len(rv))
    return (Array_RV_freq,rvfreq)

rvfreq=[[] for i in range(24)]
Array_RV_freq=[[] for i in range(24)]
for i in range(24):

    rvfreq[i]=np.linspace(min(dataTueHourly[i].X),max(dataTueHourly[i].X),
12)
    for j in range(1,len(rvfreq[i])):
        rv=[]
        rv=dataTueHourly[i][(dataTueHourly[i].X >= rvfreq[i][j-1]) &
(dataTueHourly[i].X <= rvfreq[i][j])]
        Array_RV_freq[i].append(len(rv))

counts,xbins,xbars=plt.hist(dataTueHourly[0].X,bins=70)
plt.title(f'Peaks of x at hour {0}')
plt.show()
print(np.argmax(counts))
print(dataMonHourly[0].X[55],dataMonHourly[0].Y[55])

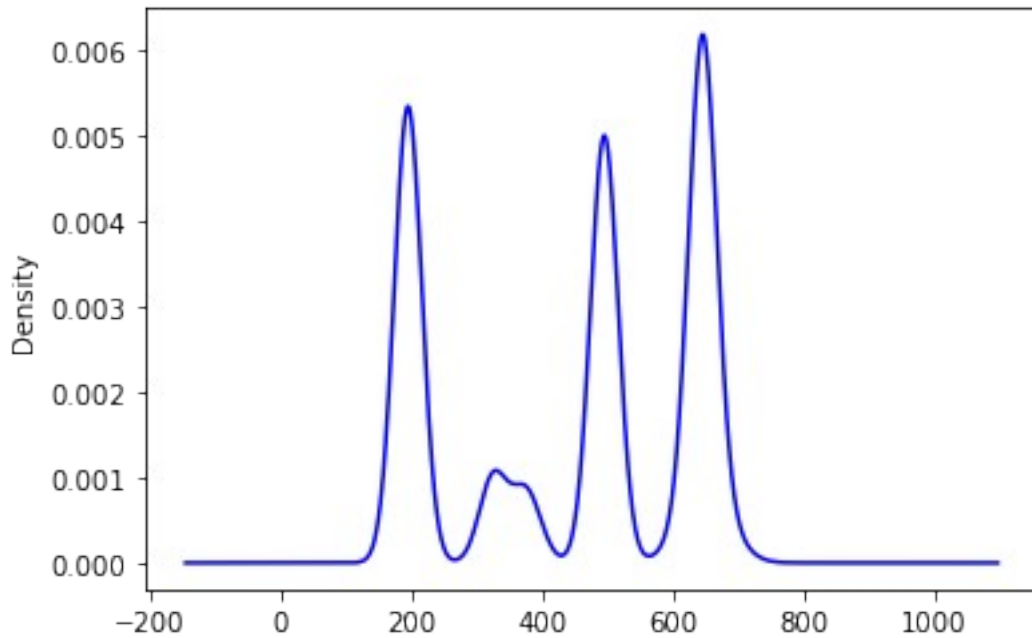
```



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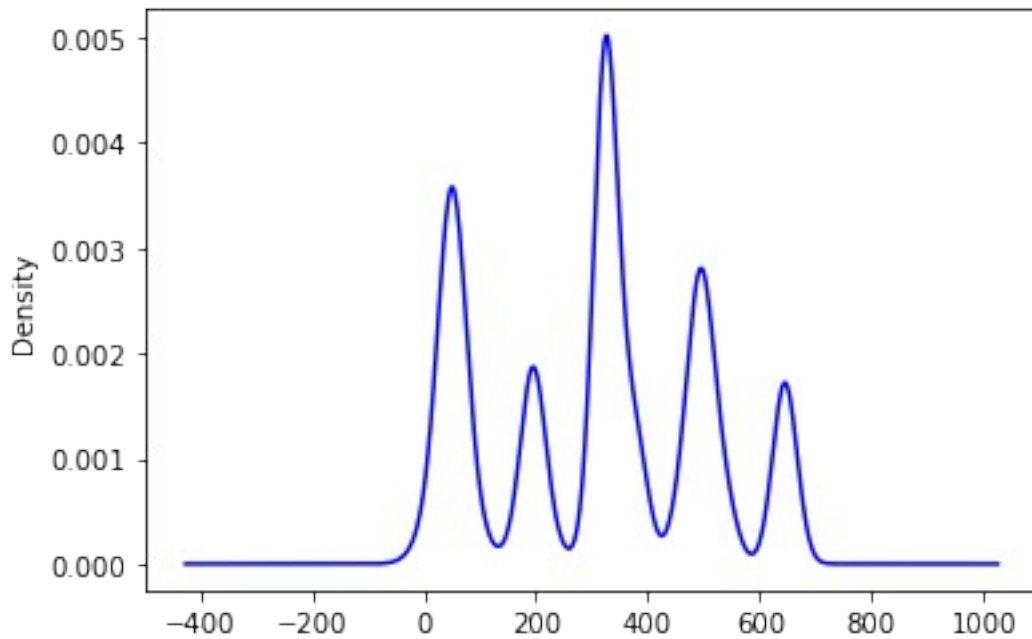
3
683.5114988030308 220.9190926099448
dataTueHourly[0].X.plot.density(color='blue')
<AxesSubplot:ylabel='Density'>

```



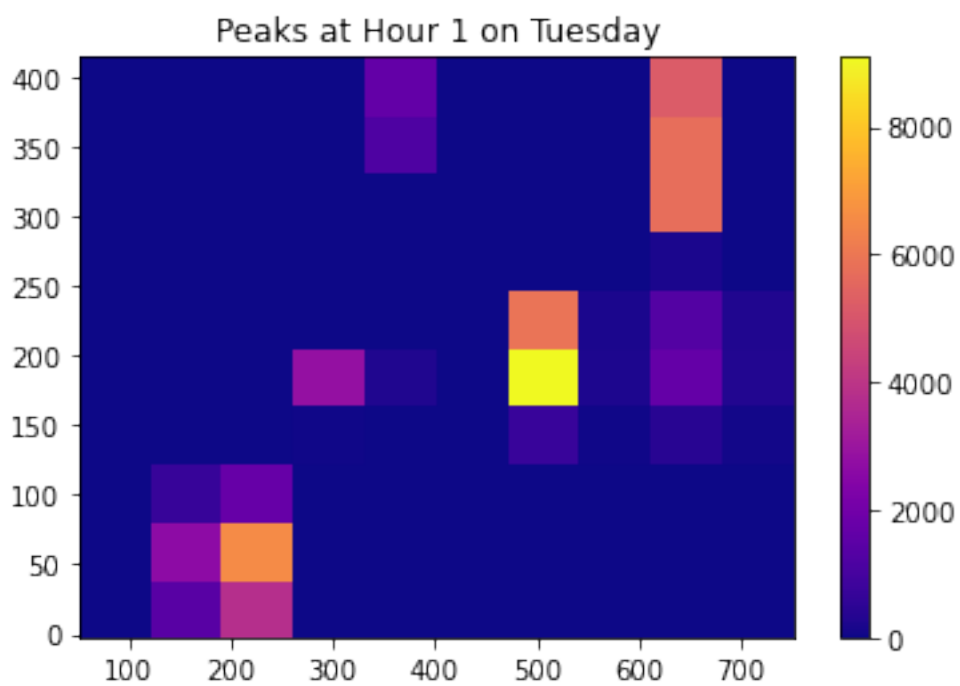
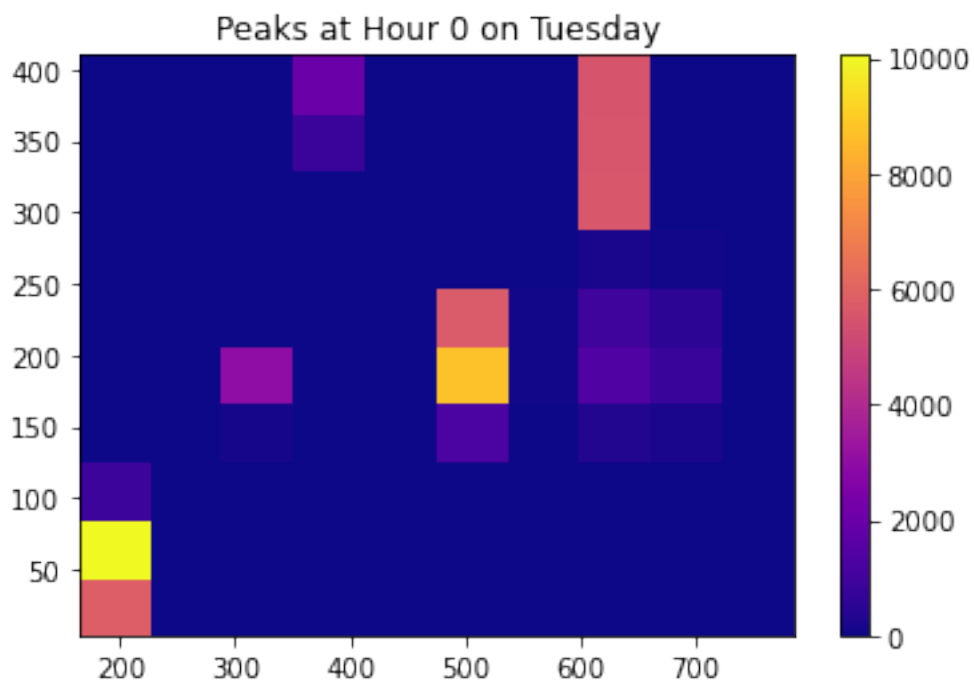
```
dataTueHourly[11].X.plot.density(color='blue')
```

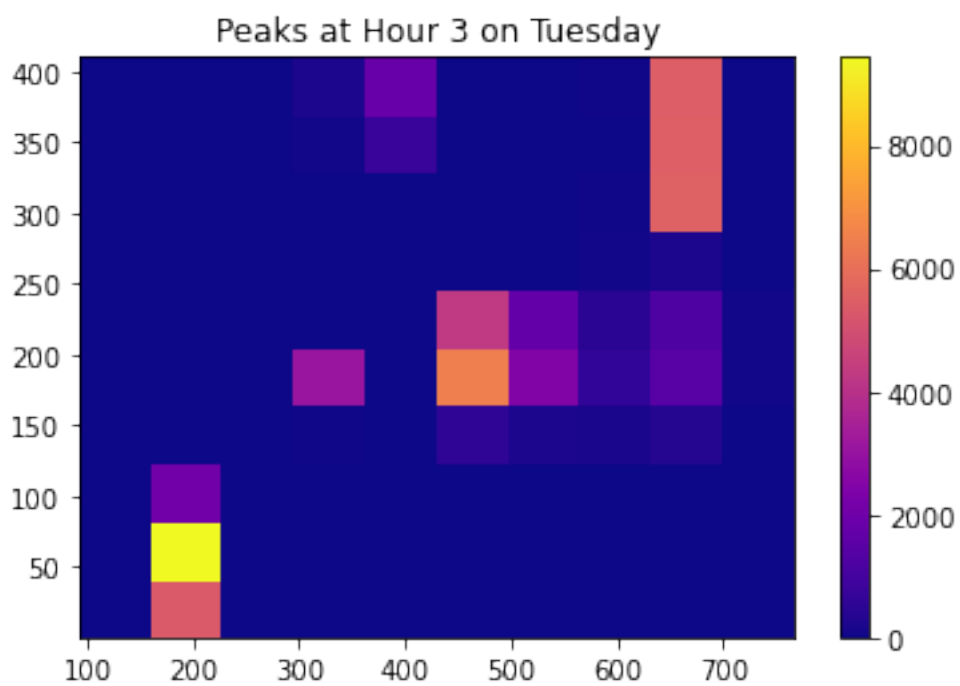
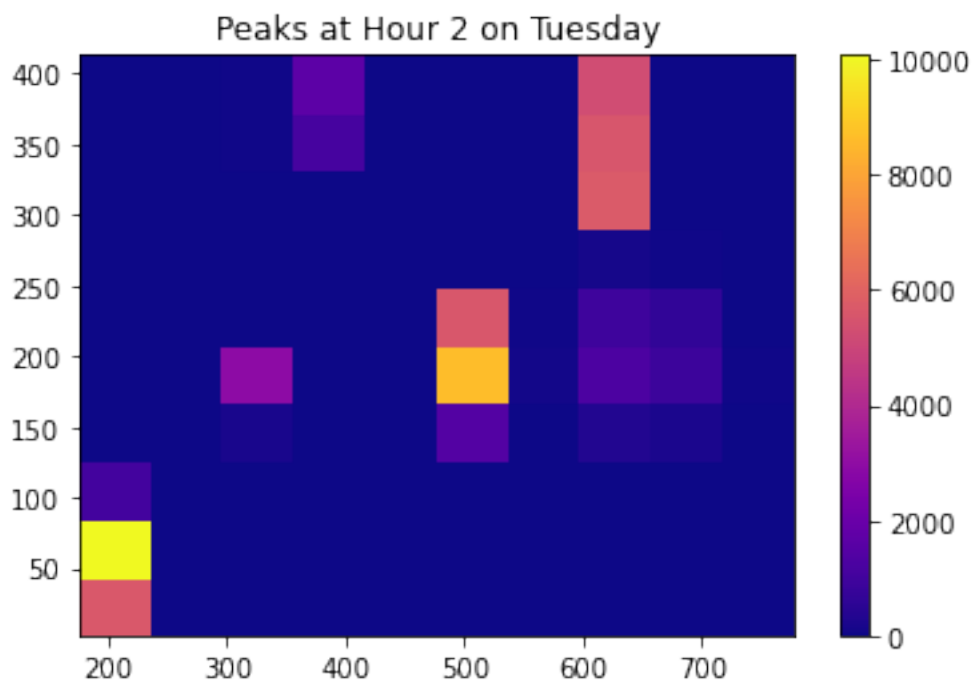
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<AxesSubplot:ylabel='Density'>
```



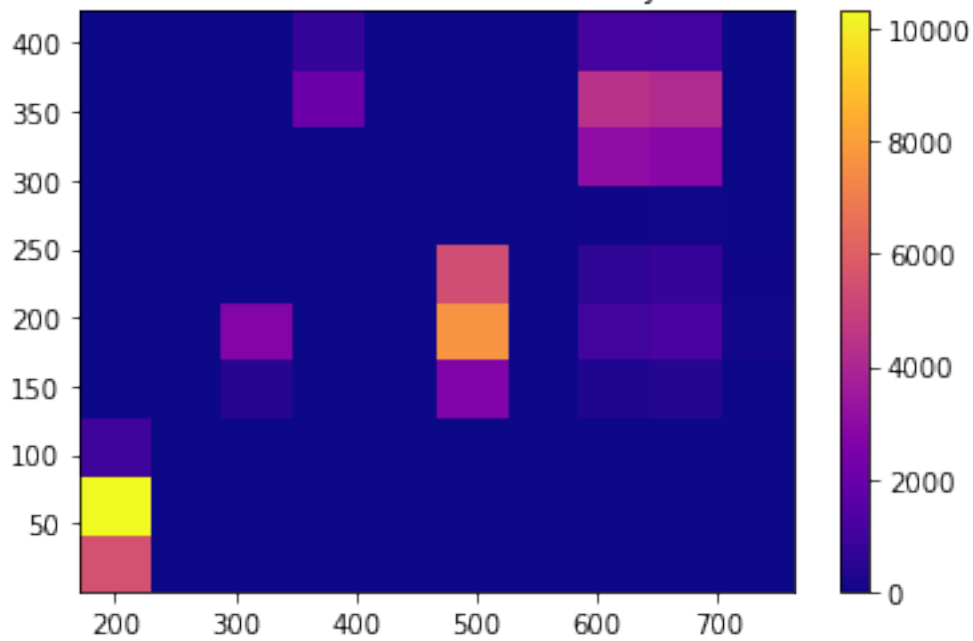
```
for i in range(24):
```

```
    plt.hist2d(dataTueHourly[i].X,dataTueHourly[i].Y,cmap=plt.cm.plasma)
    plt.title(f'Peaks at Hour {i} on Tuesday')
    plt.colorbar()
    plt.show()
```

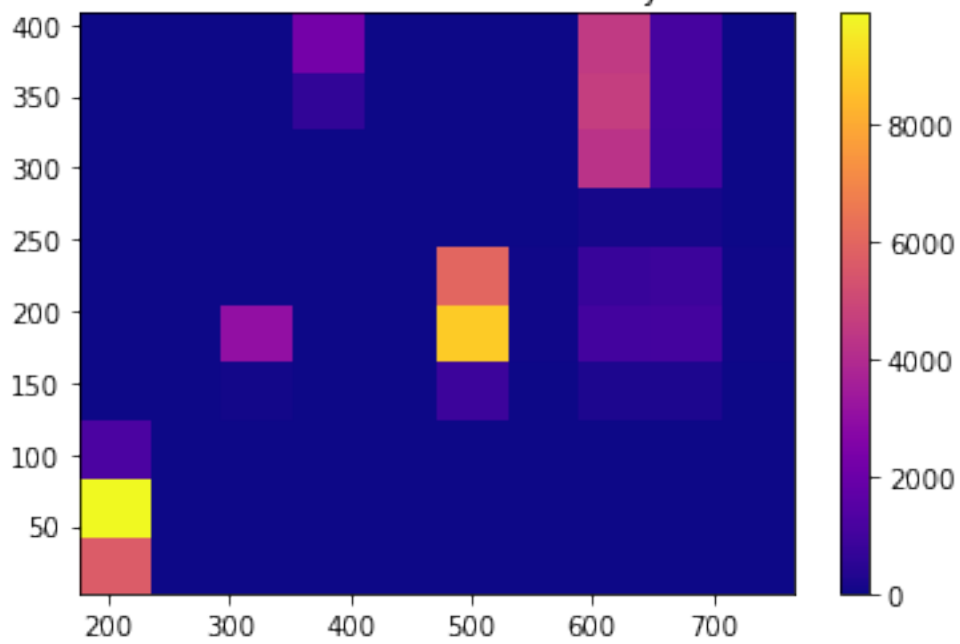


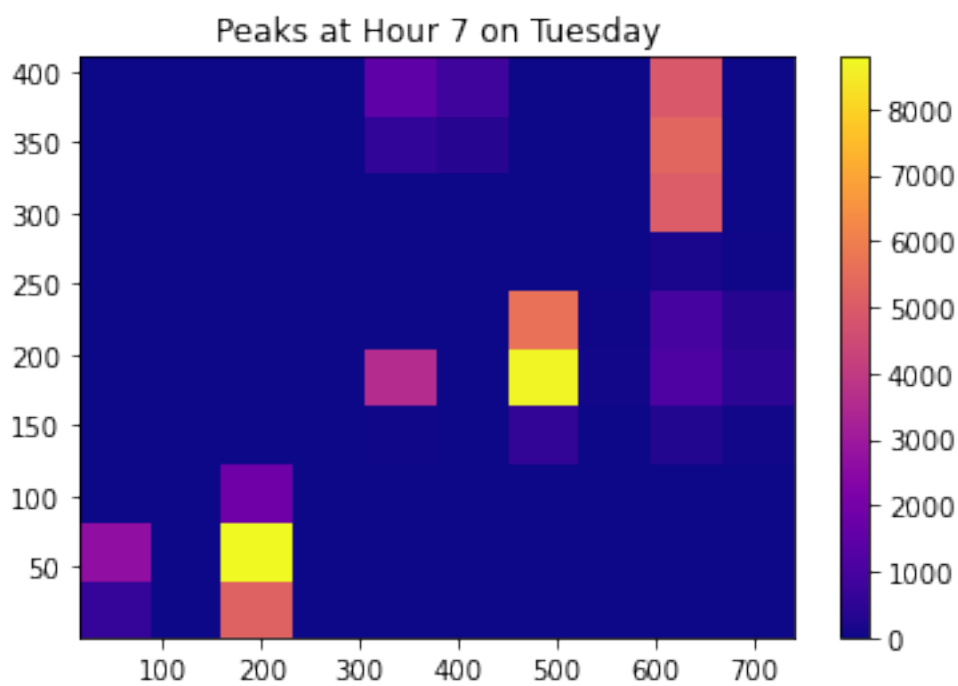
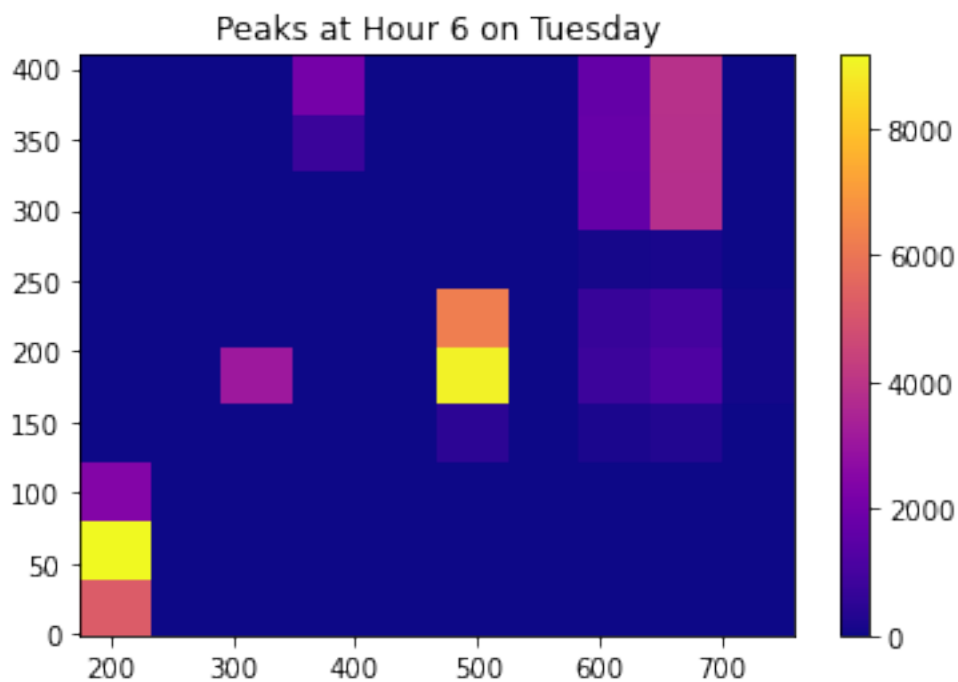


Peaks at Hour 4 on Tuesday

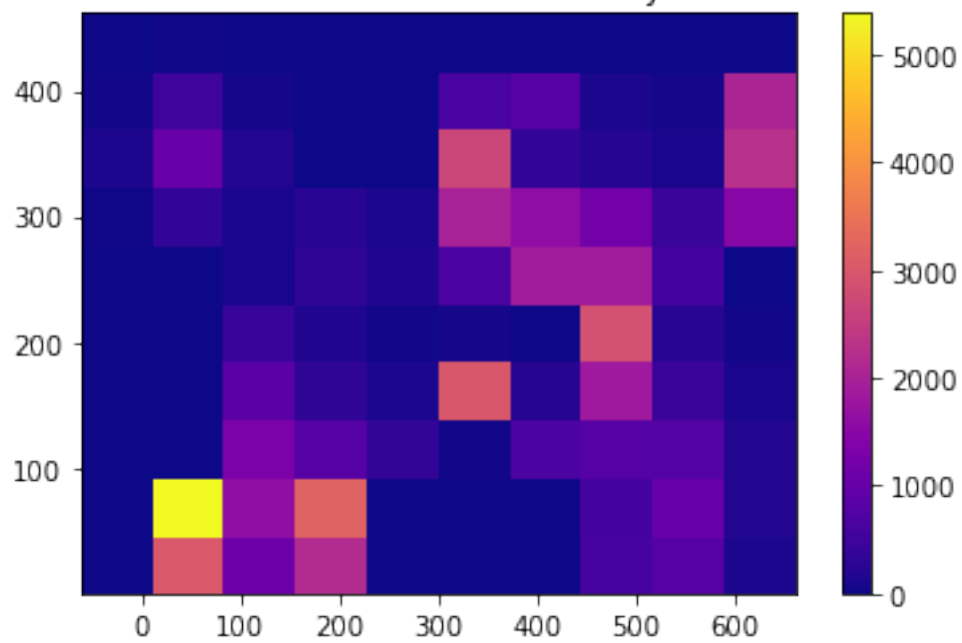


Peaks at Hour 5 on Tuesday

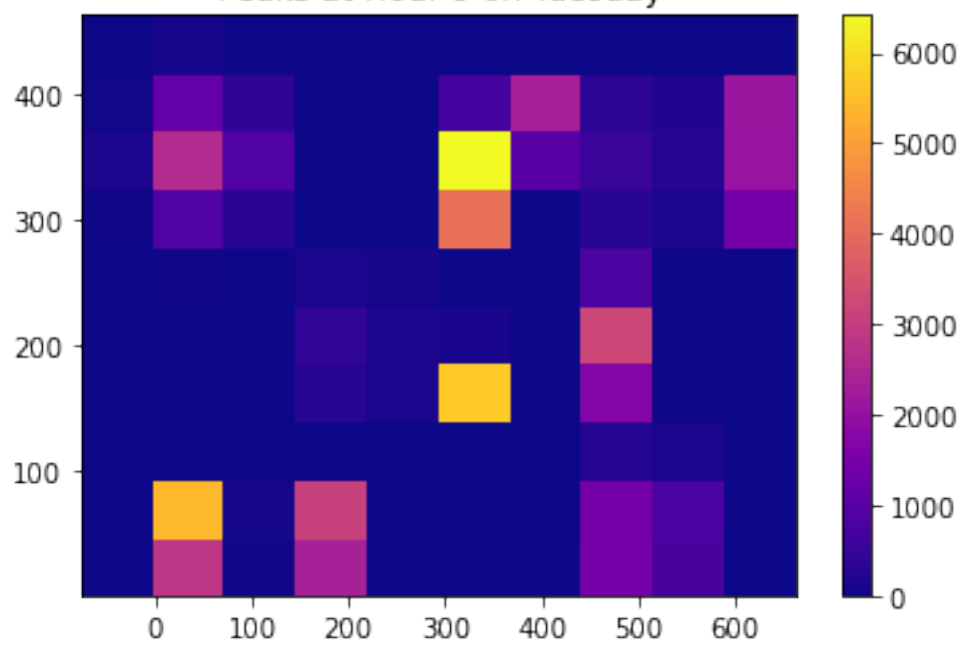




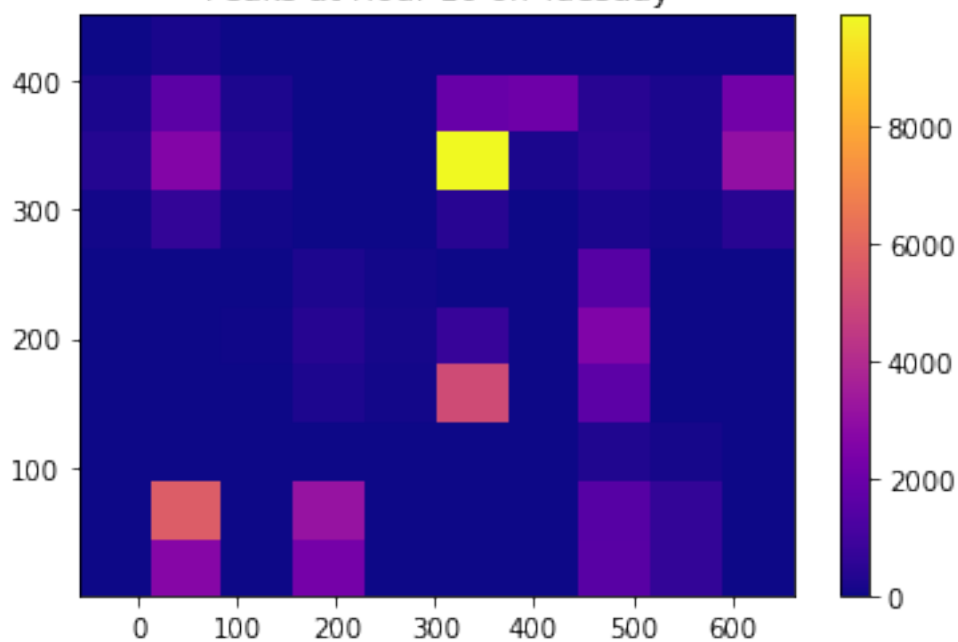
Peaks at Hour 8 on Tuesday



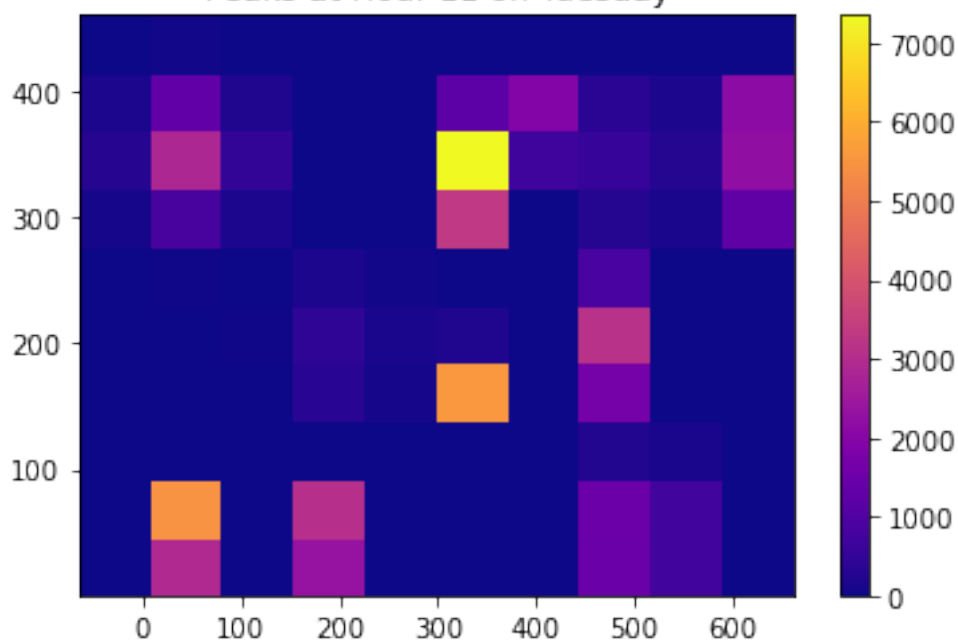
Peaks at Hour 9 on Tuesday



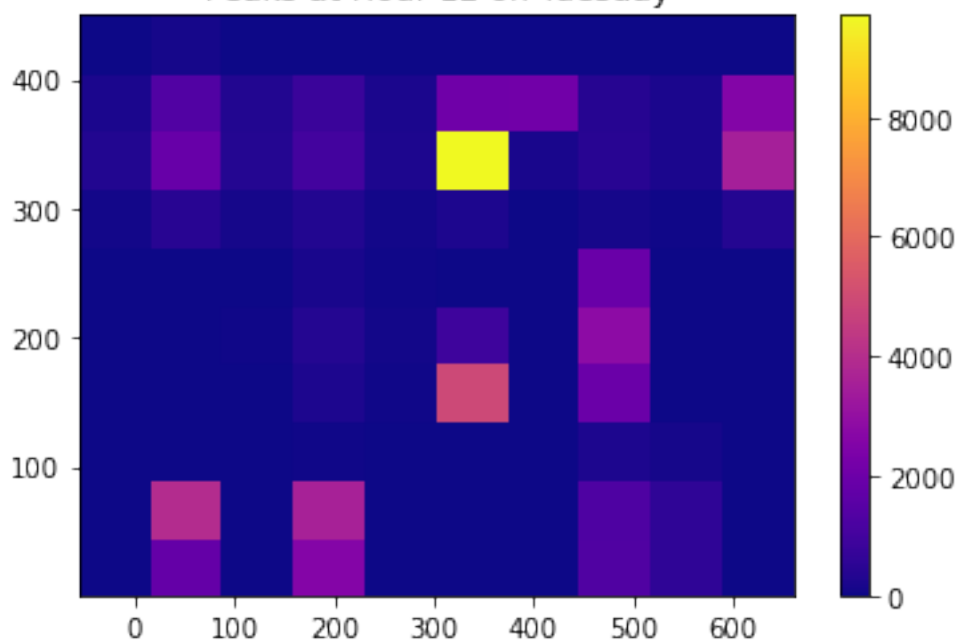
Peaks at Hour 10 on Tuesday



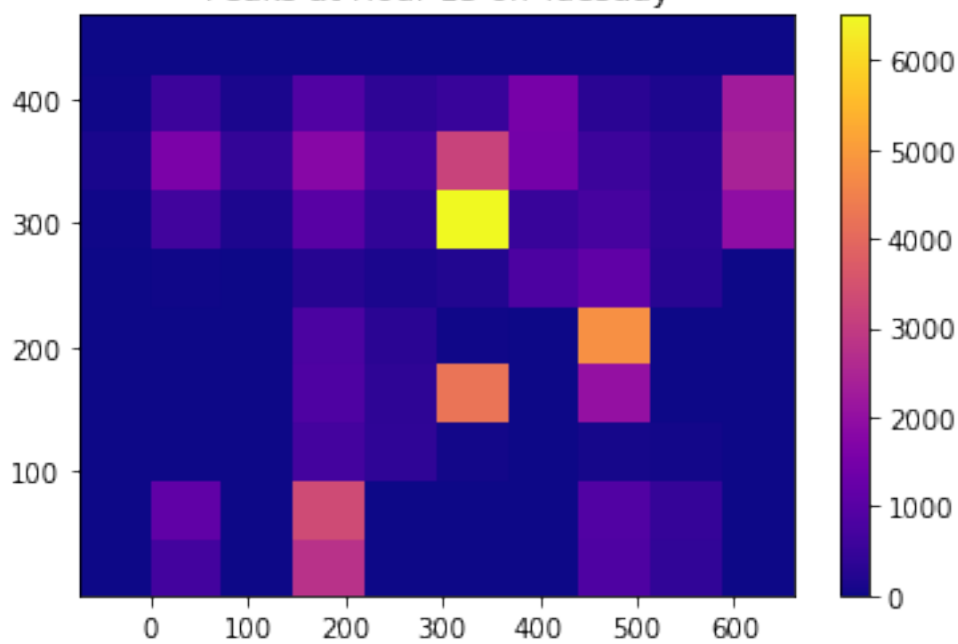
Peaks at Hour 11 on Tuesday



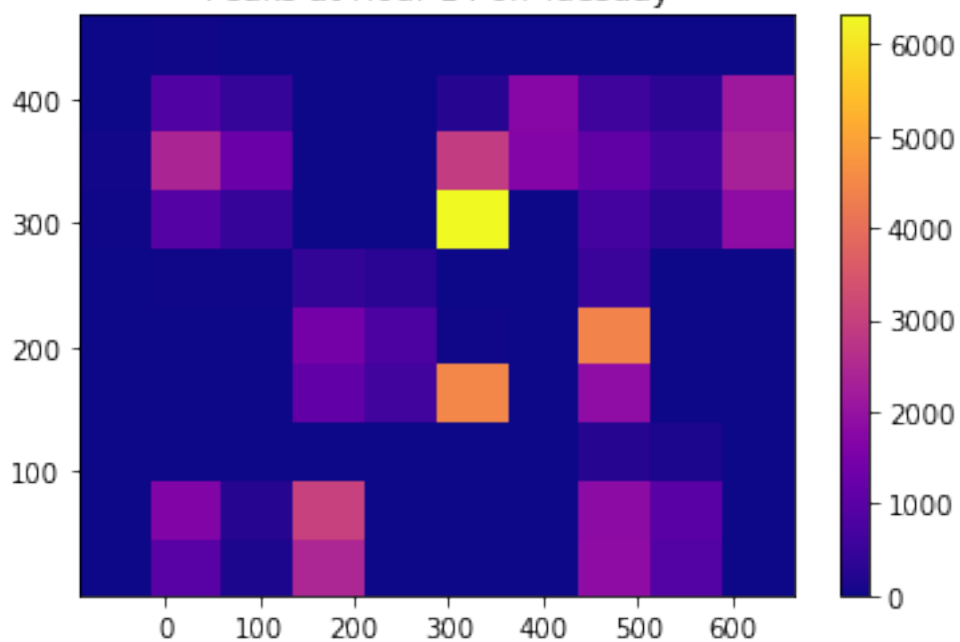
Peaks at Hour 12 on Tuesday



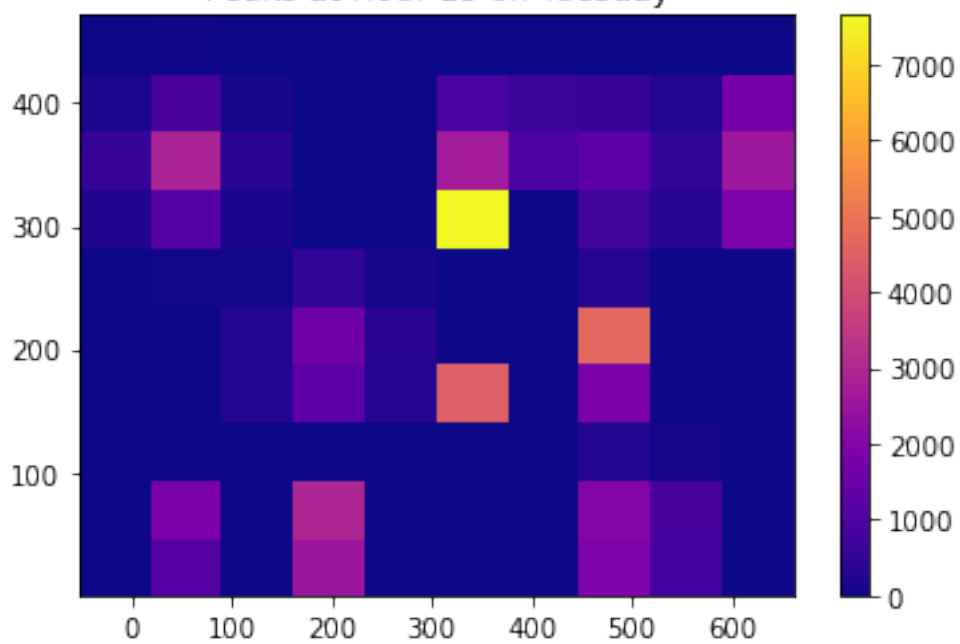
Peaks at Hour 13 on Tuesday



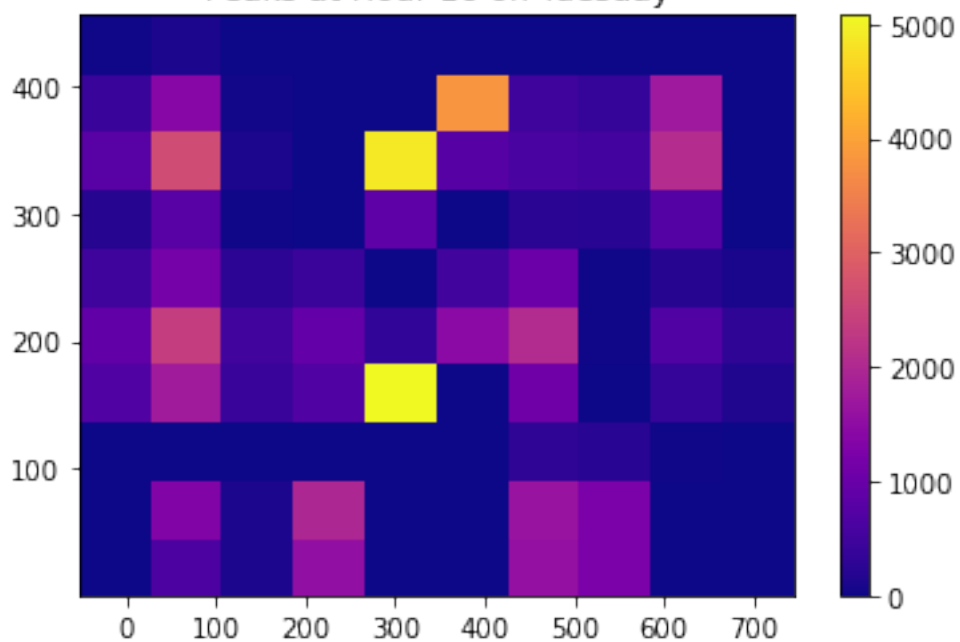
Peaks at Hour 14 on Tuesday



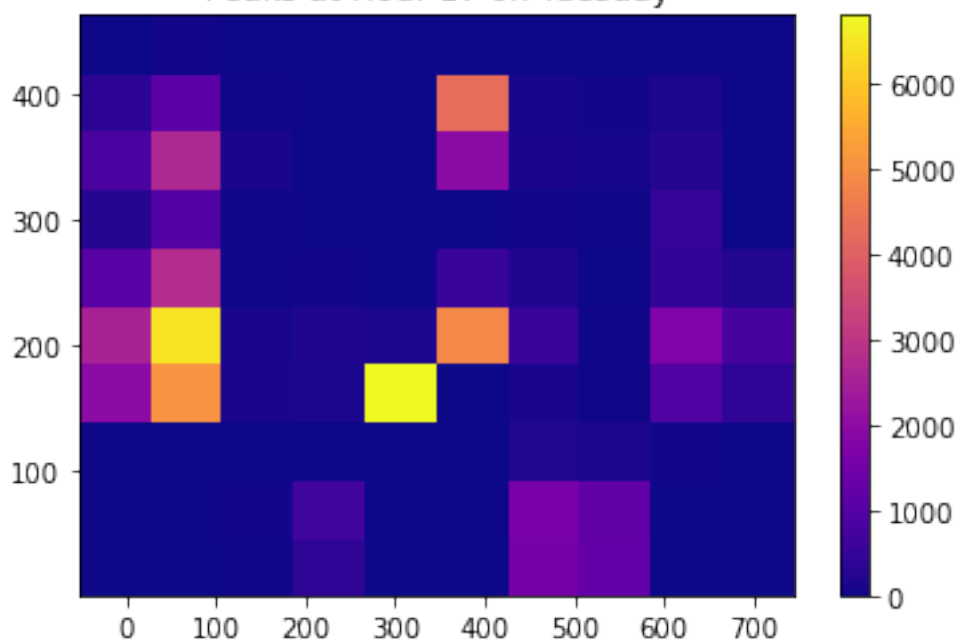
Peaks at Hour 15 on Tuesday

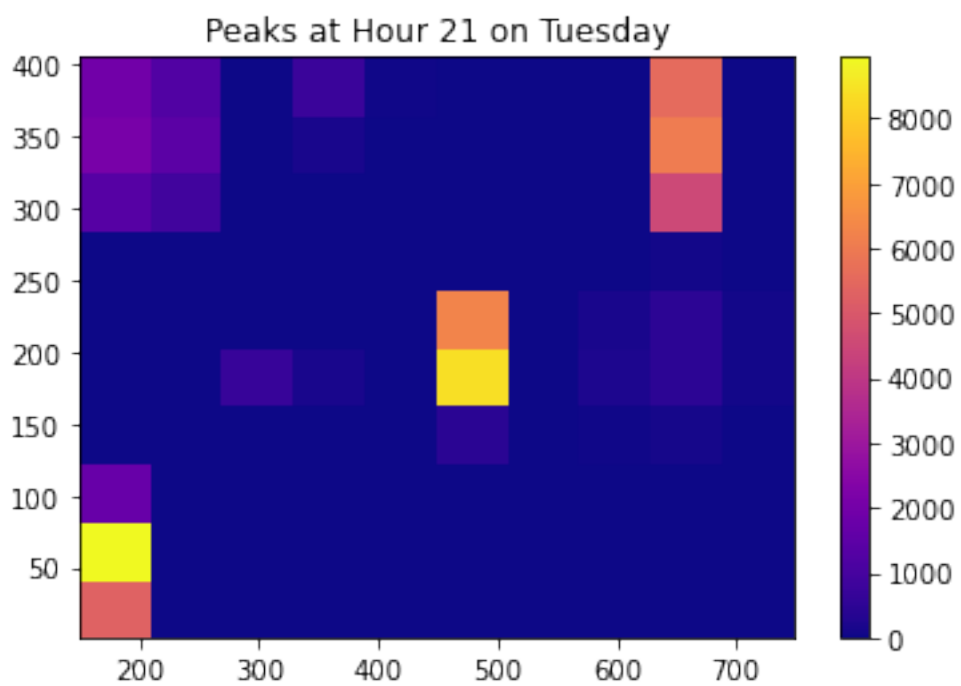
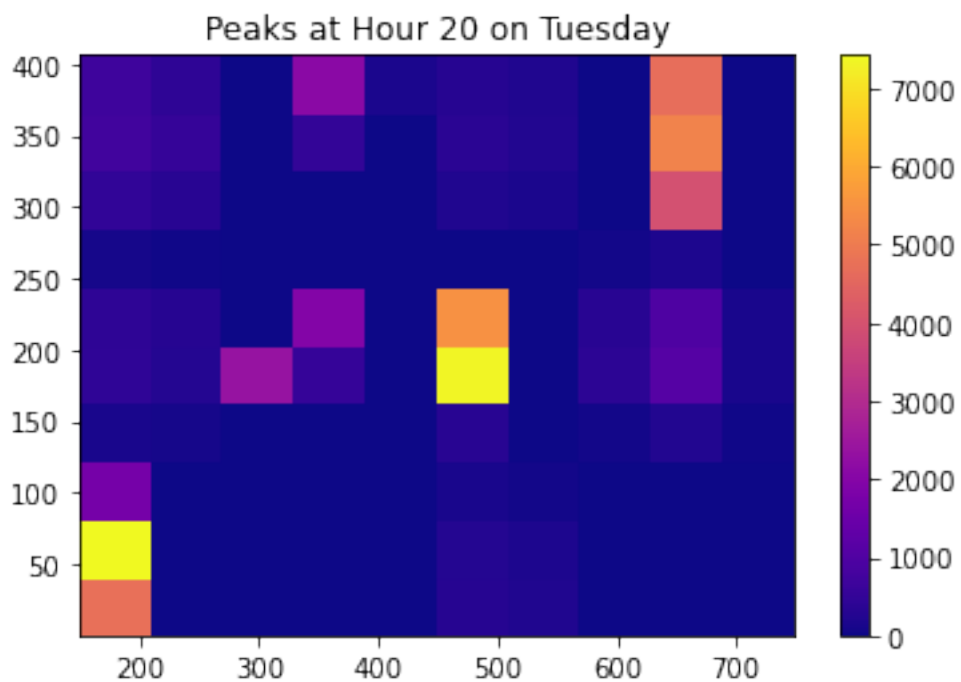


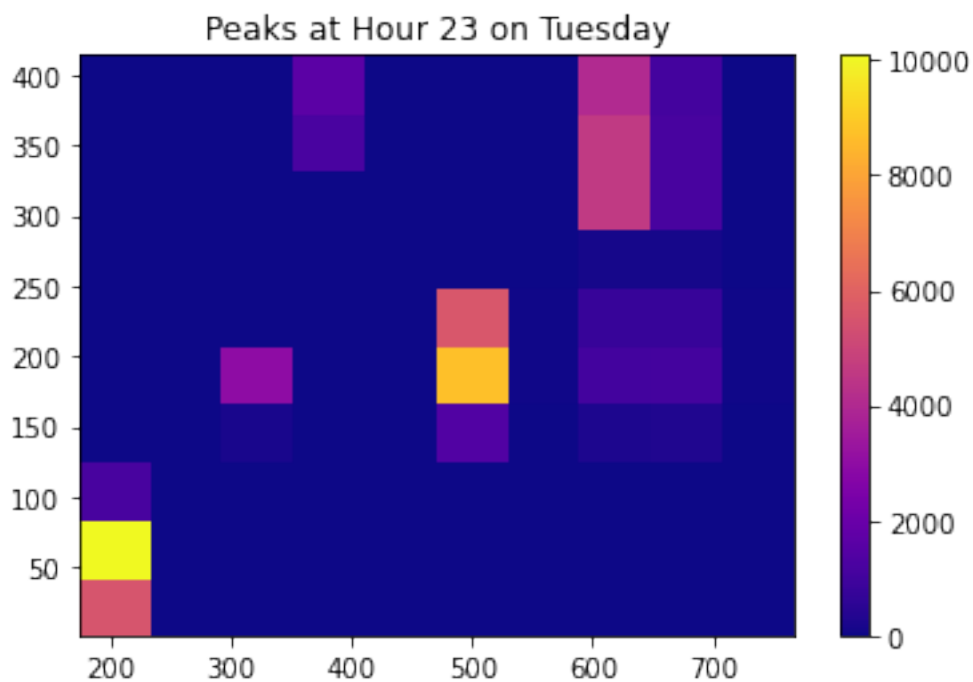
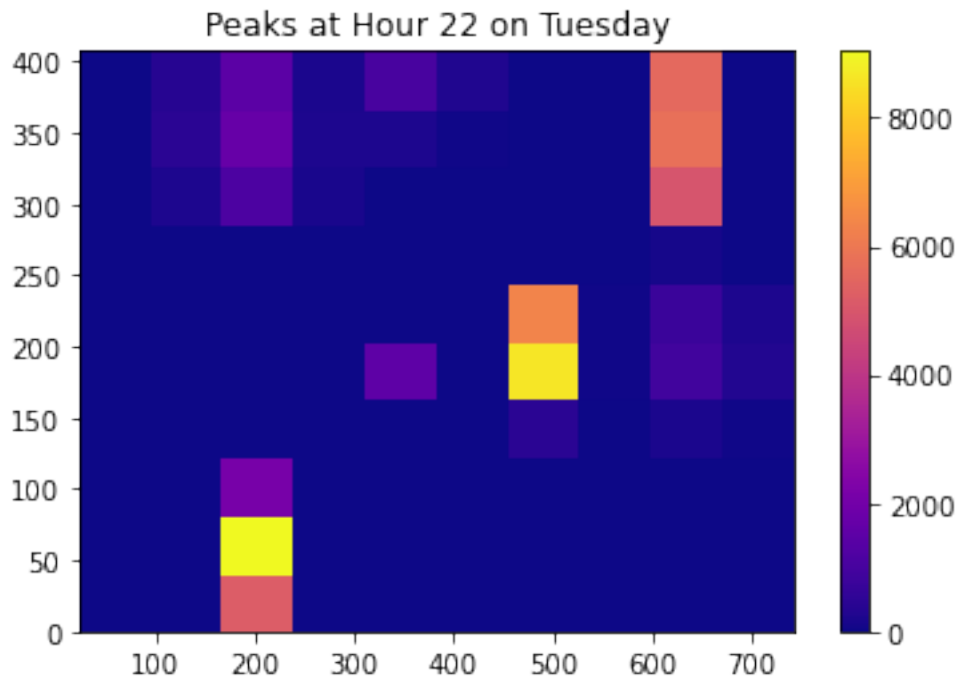
Peaks at Hour 16 on Tuesday



Peaks at Hour 17 on Tuesday







```
dataWedHourly=[]
for i in range(24):
    dataWedHourly.append(dataWed[dataWed['hour']==i])

rvfreq=[] for i in range(24)
Array_RV_freq=[] for i in range(24)
for i in range(24):
```

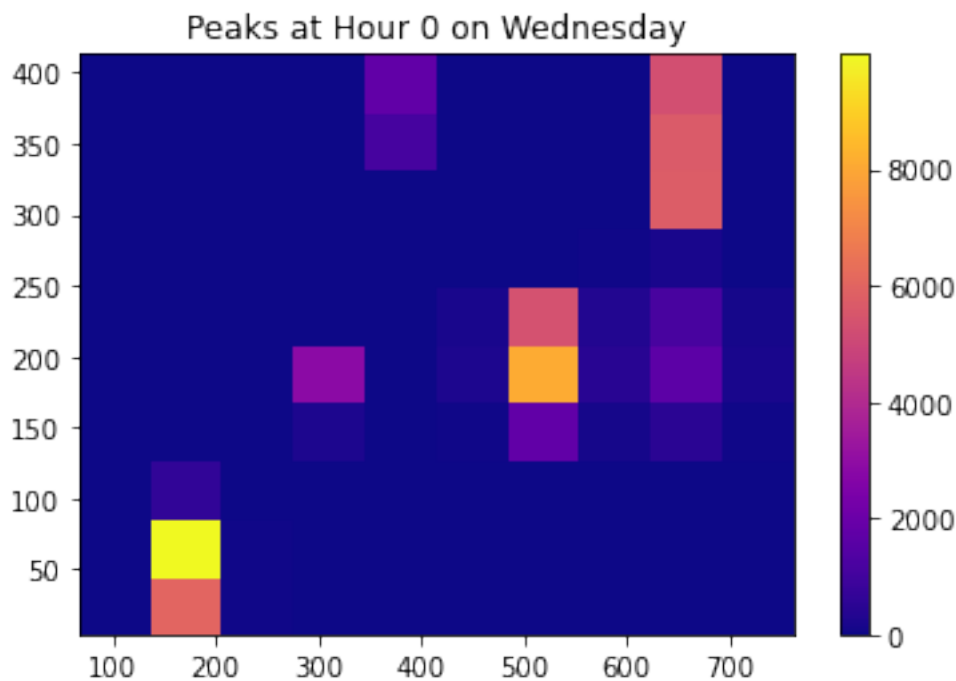
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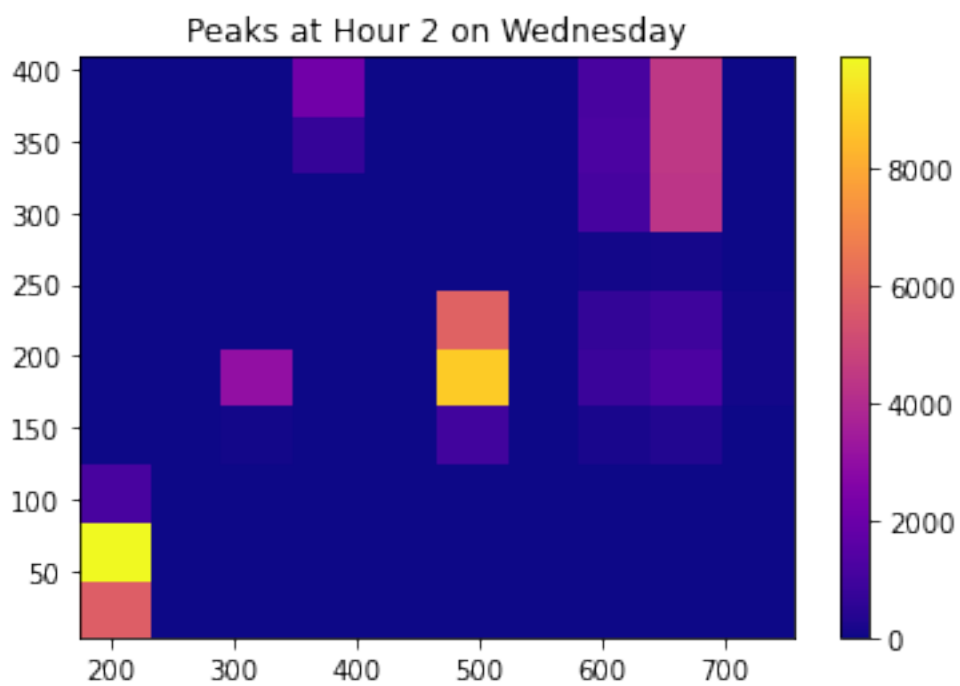
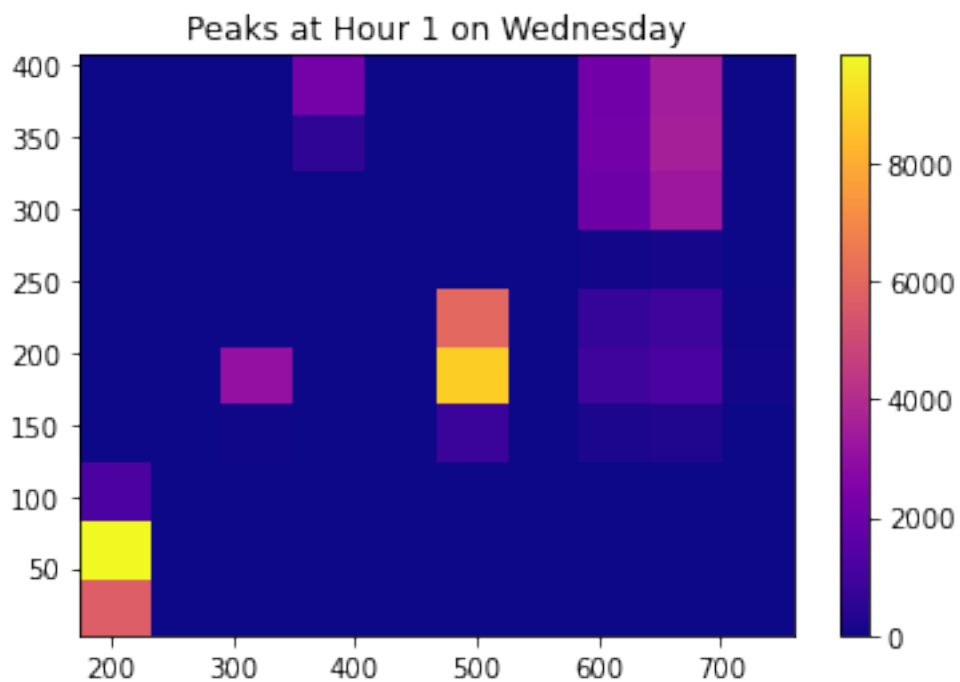
rvfreq[i]=np.linspace(min(dataWedHourly[i].X),max(dataWedHourly[i].X),
12)
    for j in range(1,len(rvfreq[i])):
        rv=[]
        rv=dataWedHourly[i][(dataWedHourly[i].X >= rvfreq[i][j-1]) &
(dataWedHourly[i].X <= rvfreq[i][j])]
        Array_RV_freq[i].append(len(rv))

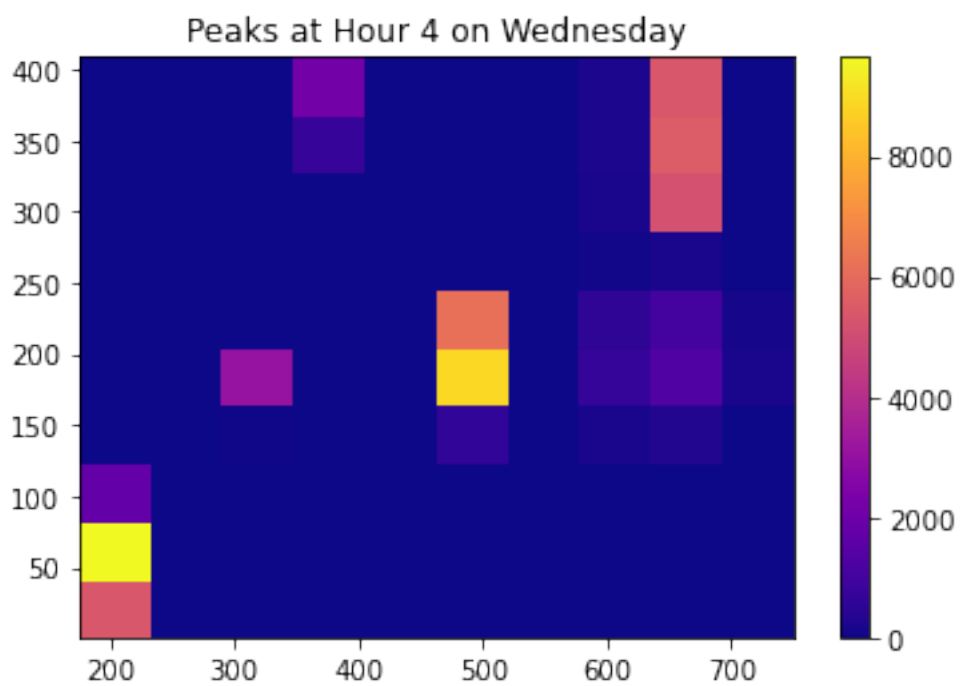
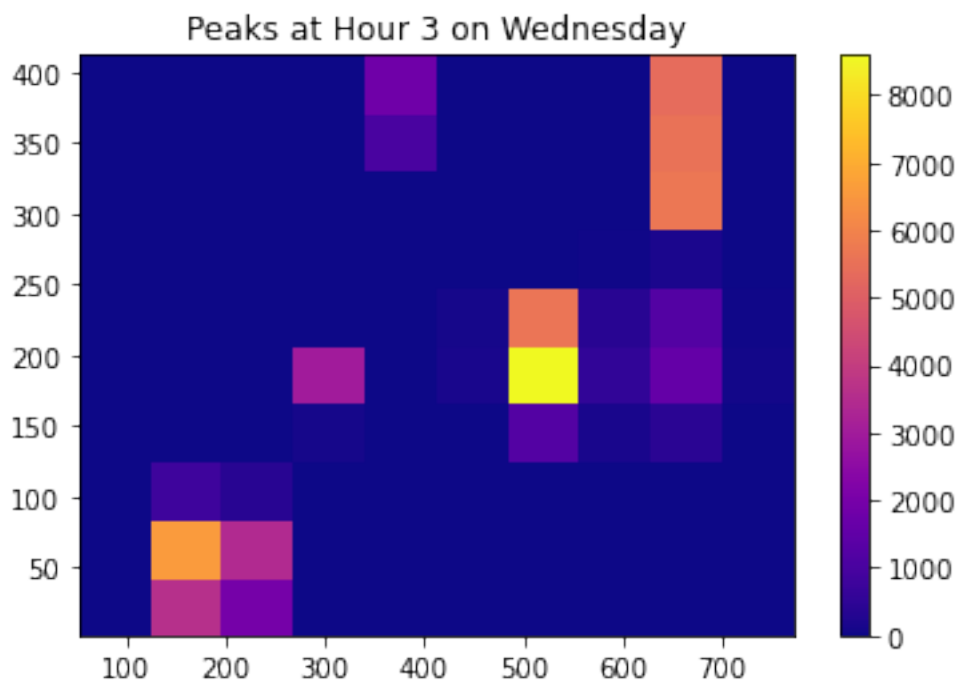
for i in range(24):

plt.hist2d(dataWedHourly[i].X,dataWedHourly[i].Y,cmap=plt.cm.plasma)
plt.title(f'Peaks at Hour {i} on Wednesday')
plt.colorbar()
plt.show()

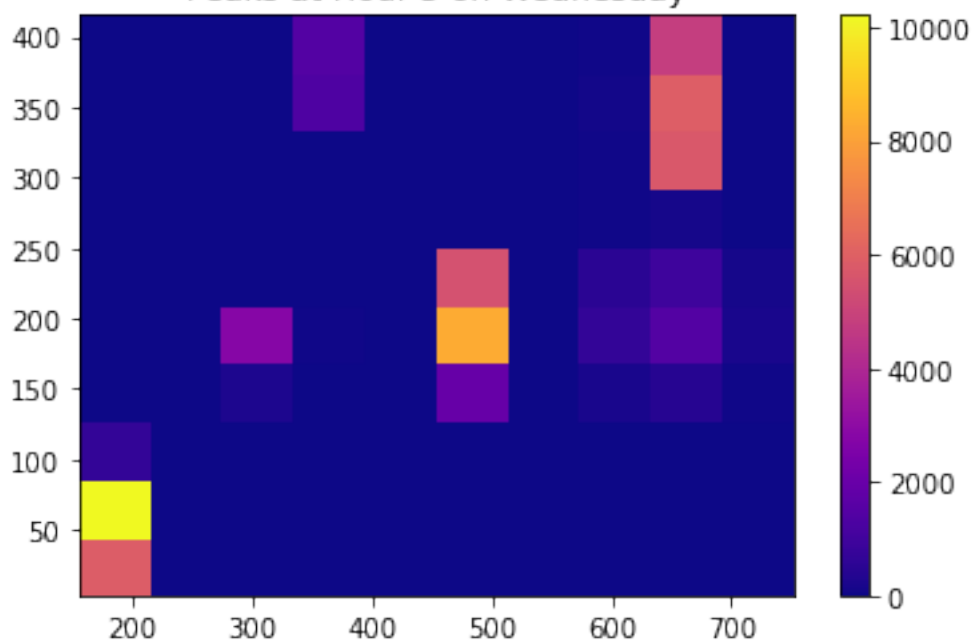
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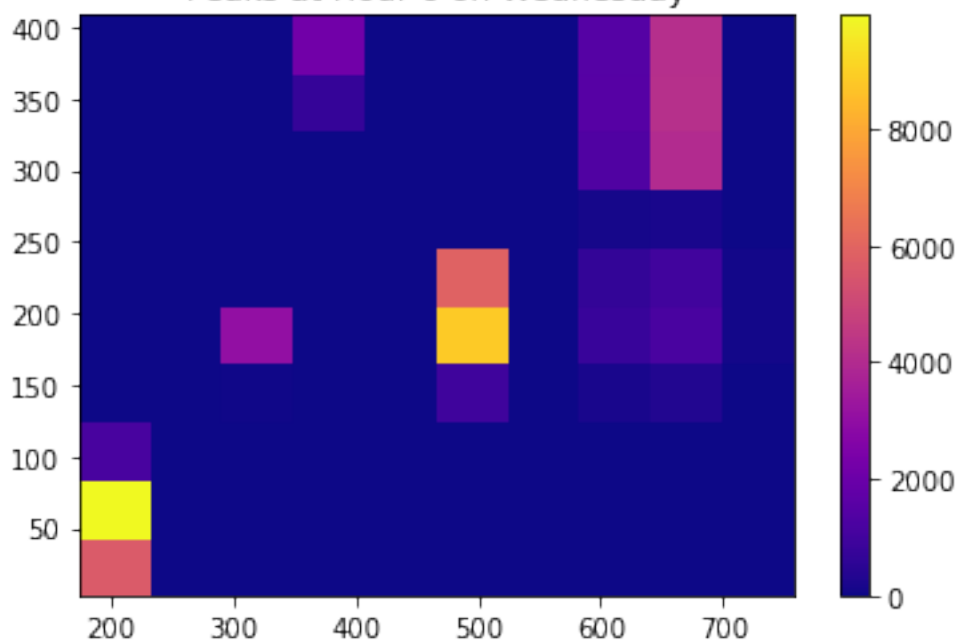


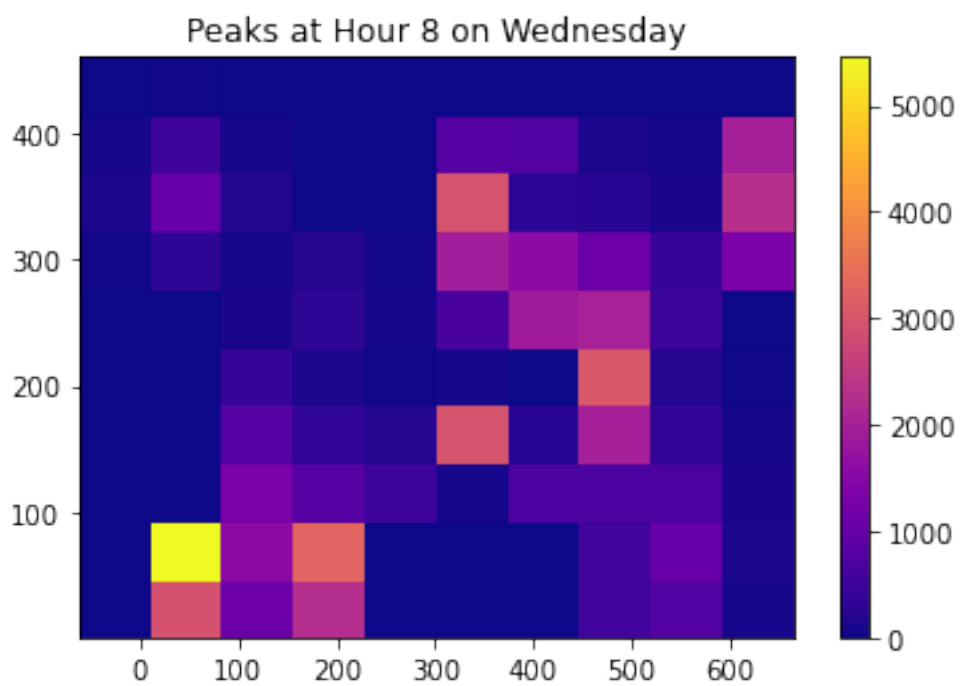
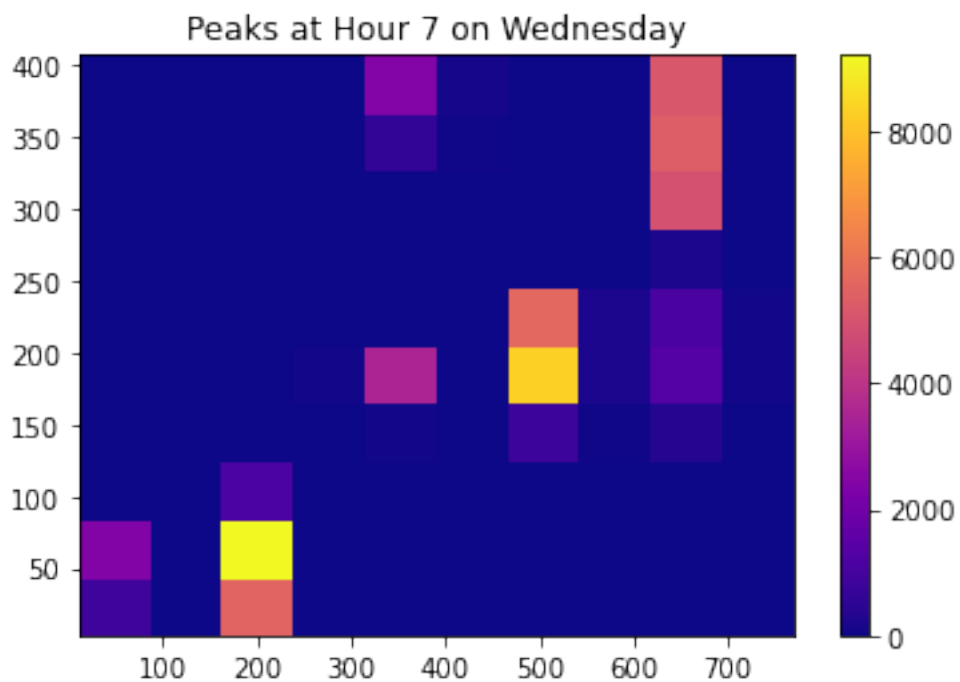


Peaks at Hour 5 on Wednesday

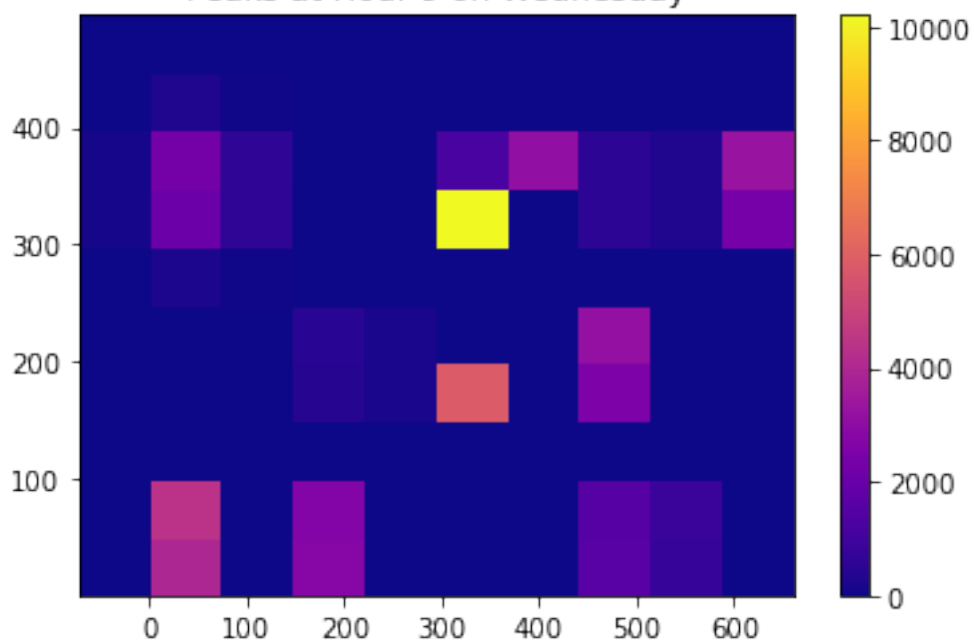


Peaks at Hour 6 on Wednesday

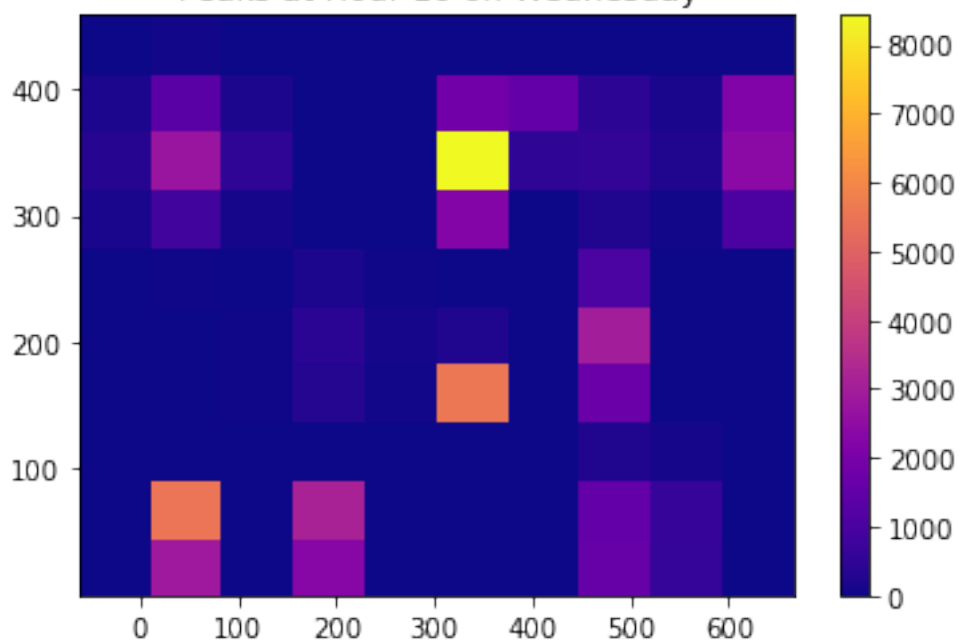




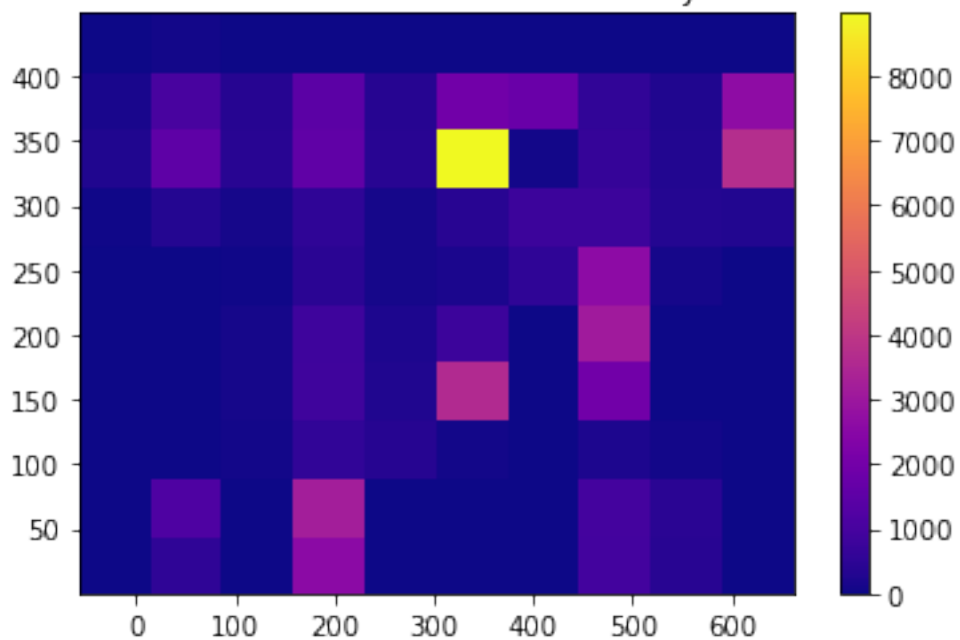
Peaks at Hour 9 on Wednesday



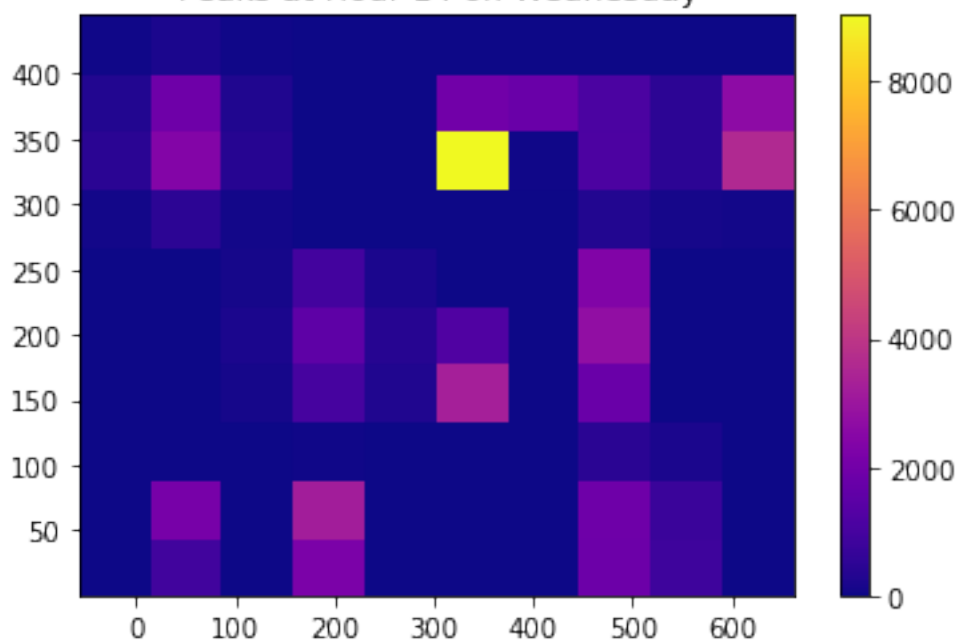
Peaks at Hour 10 on Wednesday

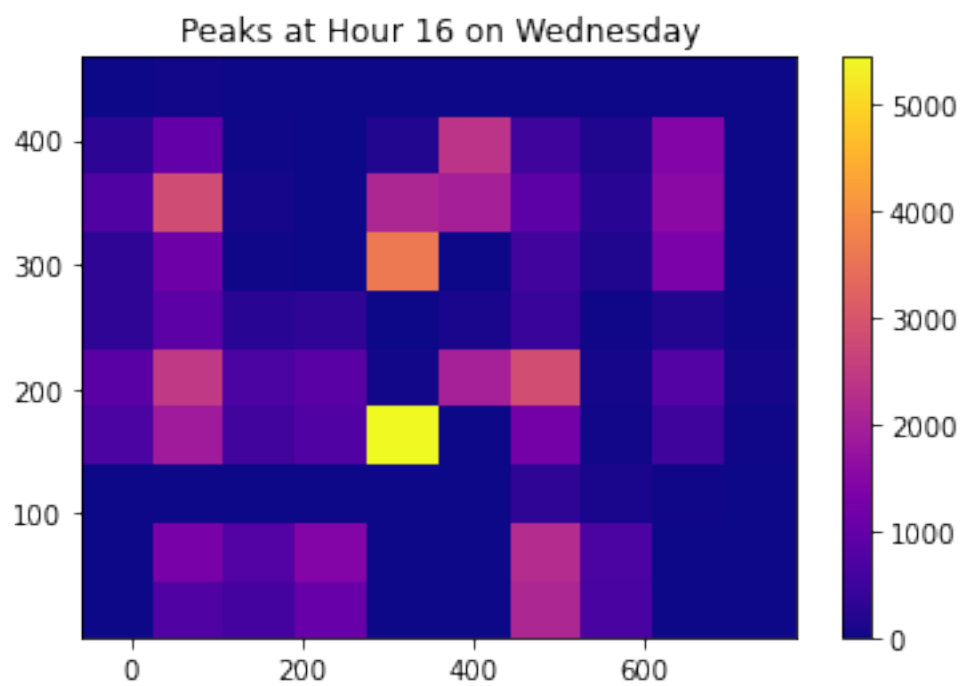
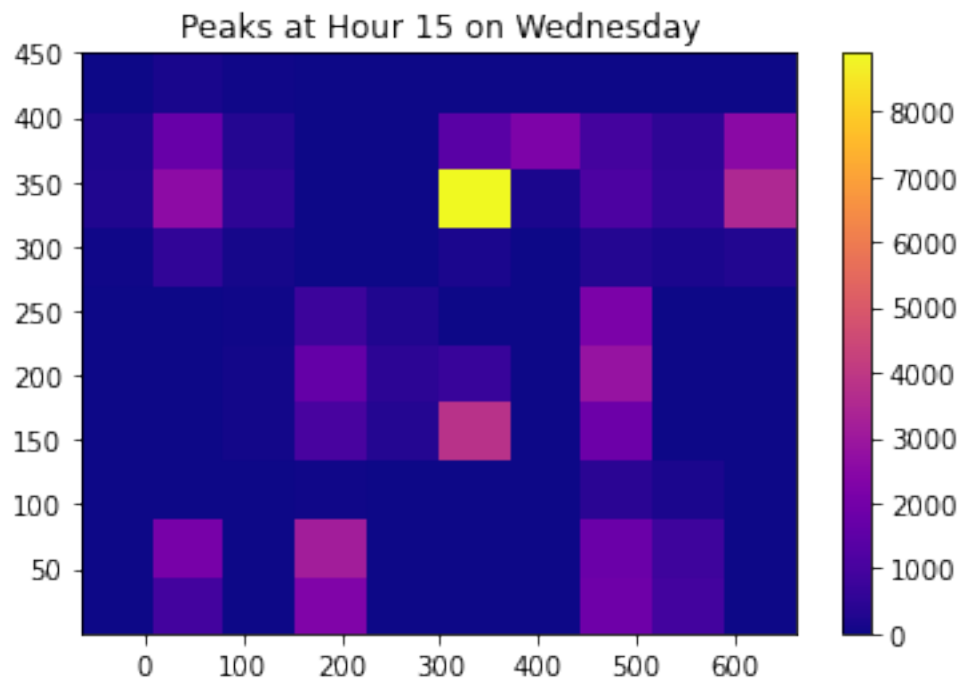


Peaks at Hour 13 on Wednesday

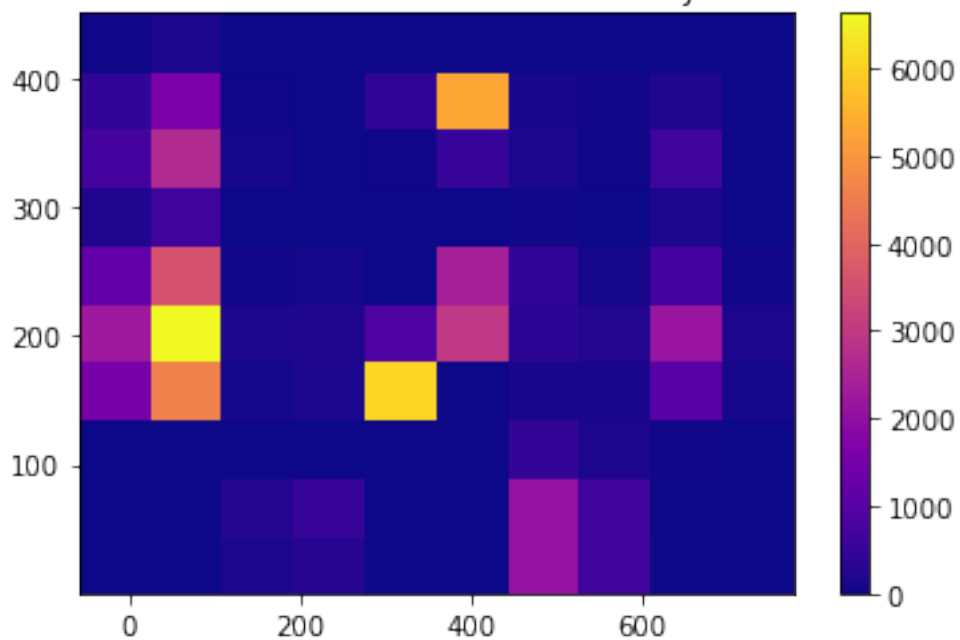


Peaks at Hour 14 on Wednesday

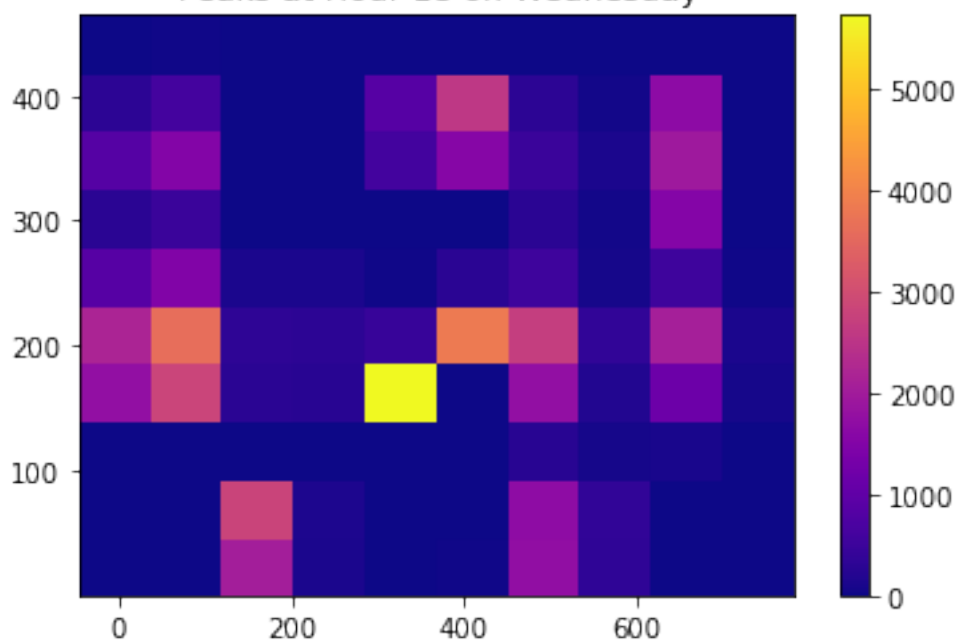




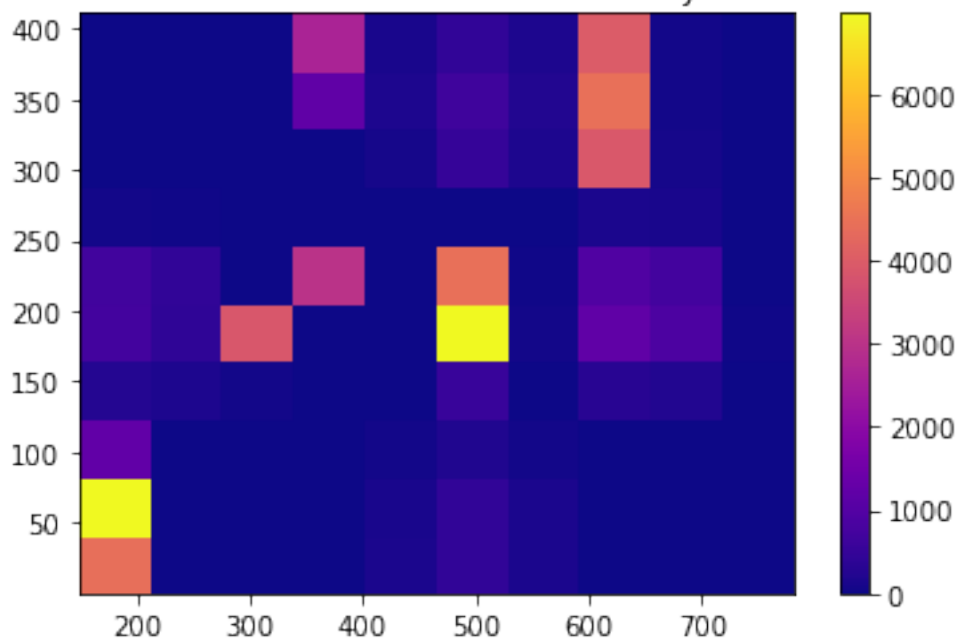
Peaks at Hour 17 on Wednesday



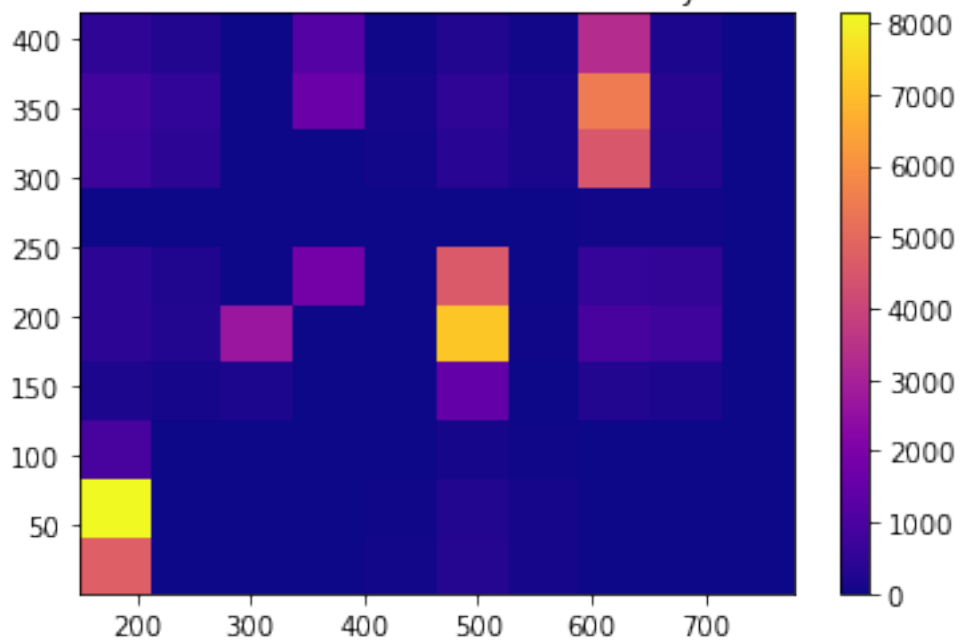
Peaks at Hour 18 on Wednesday



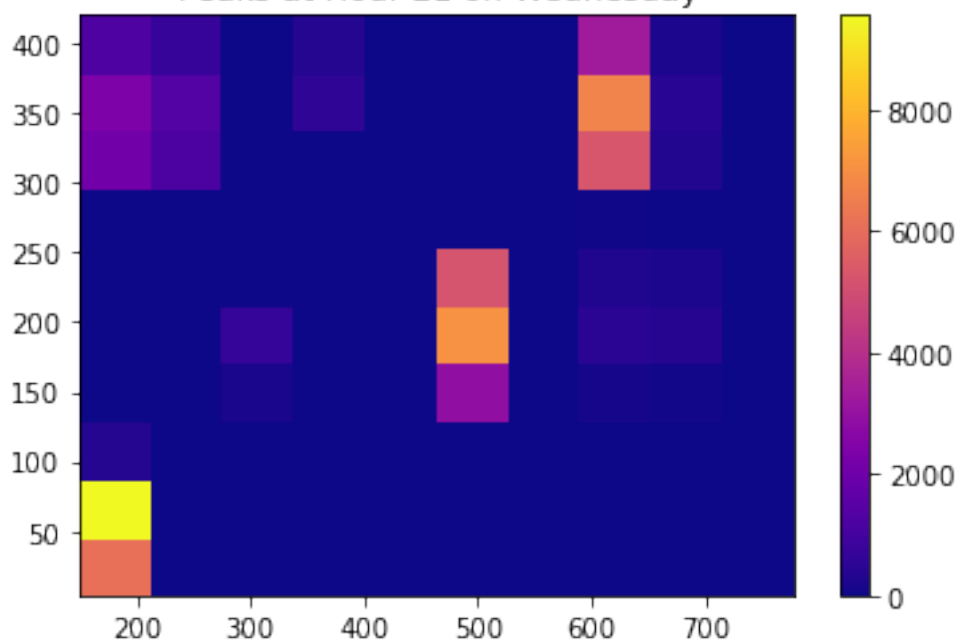
Peaks at Hour 19 on Wednesday



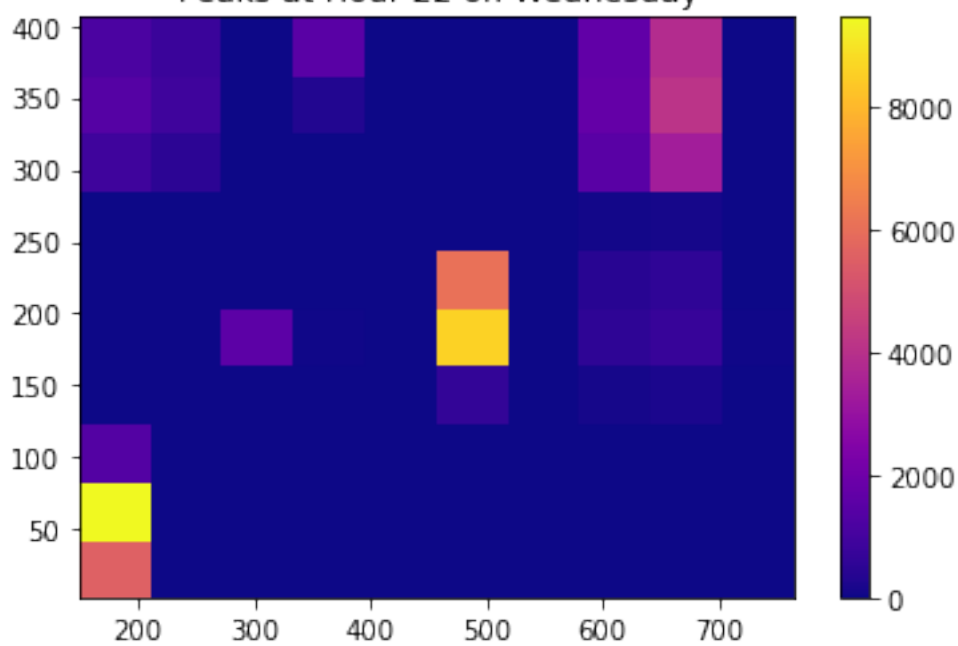
Peaks at Hour 20 on Wednesday

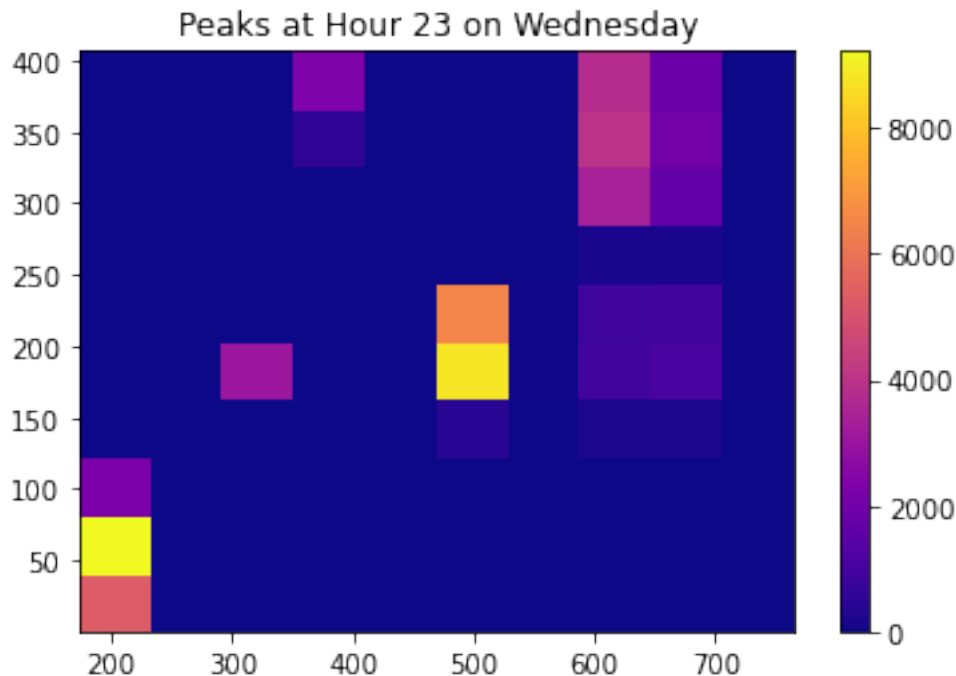


Peaks at Hour 21 on Wednesday



Peaks at Hour 22 on Wednesday





```

dataThuHourly=[]
for i in range(24):
    dataThuHourly.append(dataThu[dataThu['hour']==i])

rvfreq=[] for i in range(24)]
Array_RV_freq=[] for i in range(24)]
for i in range(24):

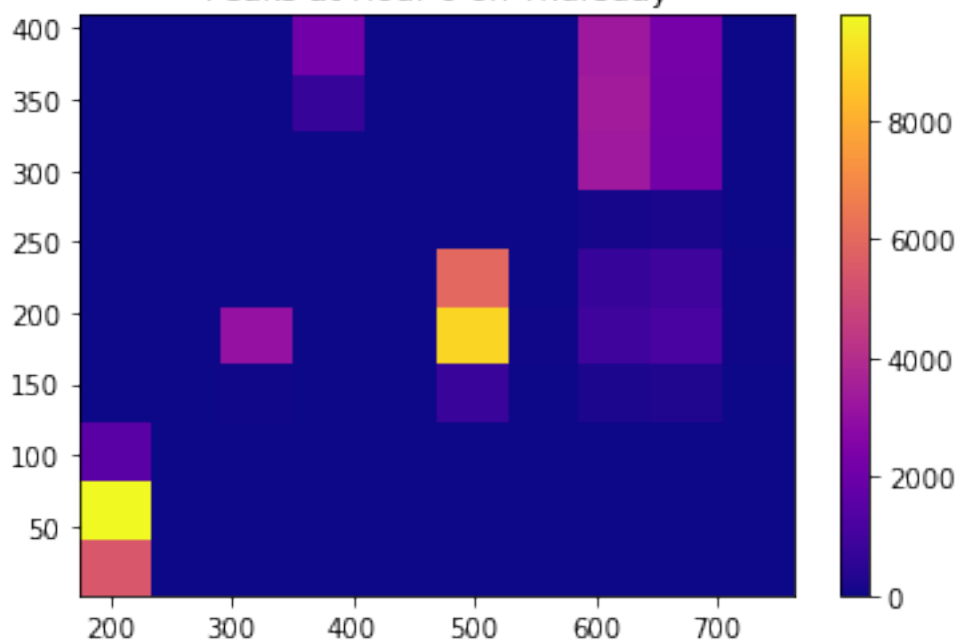
    rvfreq[i]=np.linspace(min(dataThuHourly[i].X),max(dataThuHourly[i].X),
12)
    for j in range(1,len(rvfreq[i])):
        rv=[]
        rv=dataThuHourly[i][(dataThuHourly[i].X >= rvfreq[i][j-1]) &
(dataThuHourly[i].X >= rvfreq[i][j])]
        Array_RV_freq[i].append(len(rv))

for i in range(24):

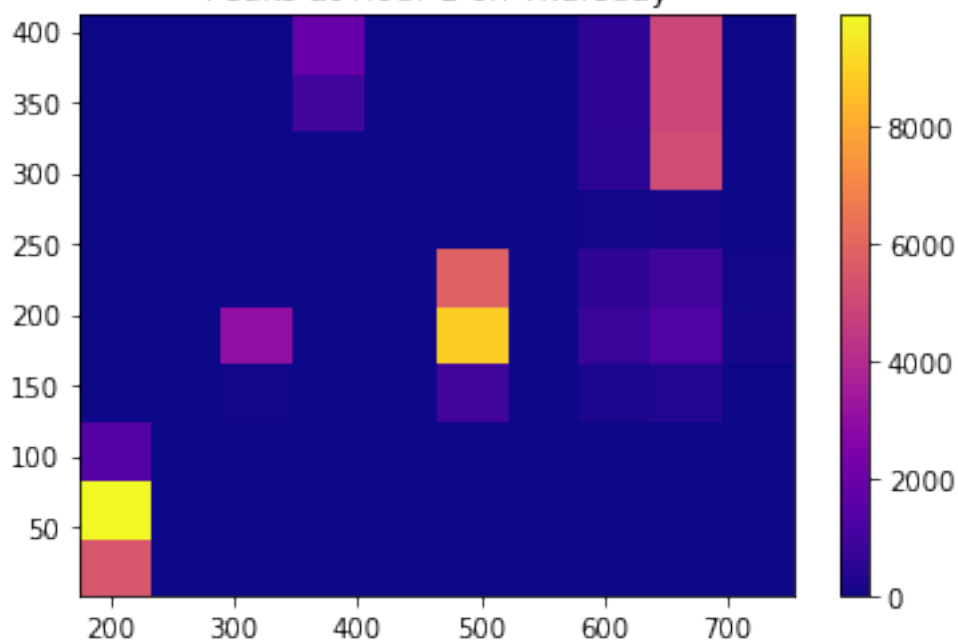
plt.hist2d(dataThuHourly[i].X,dataThuHourly[i].Y,cmap=plt.cm.plasma)
plt.title(f'Peaks at Hour {i} on Thursday')
plt.colorbar()
plt.show()

```

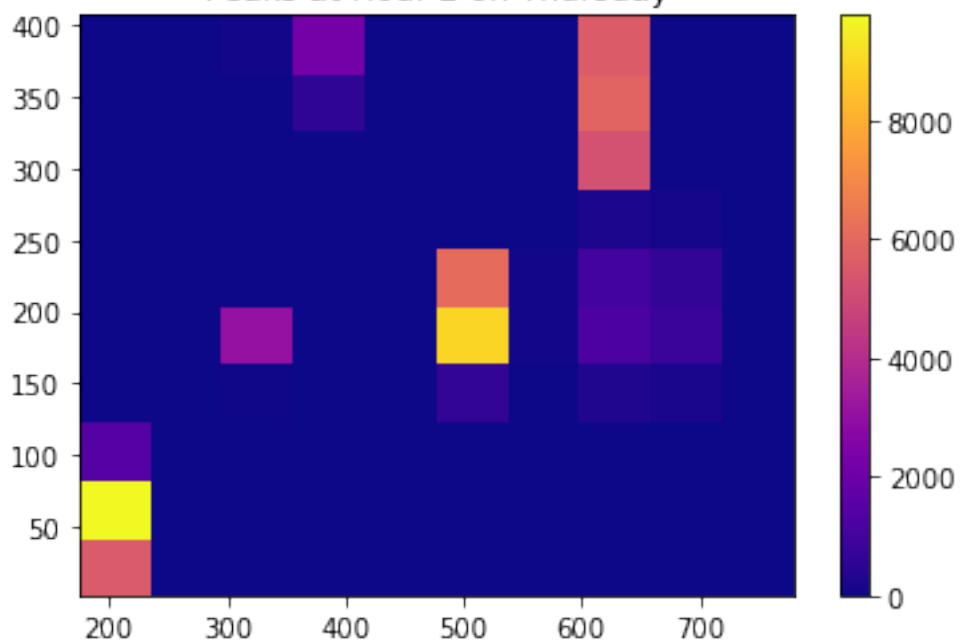
Peaks at Hour 0 on Thursday



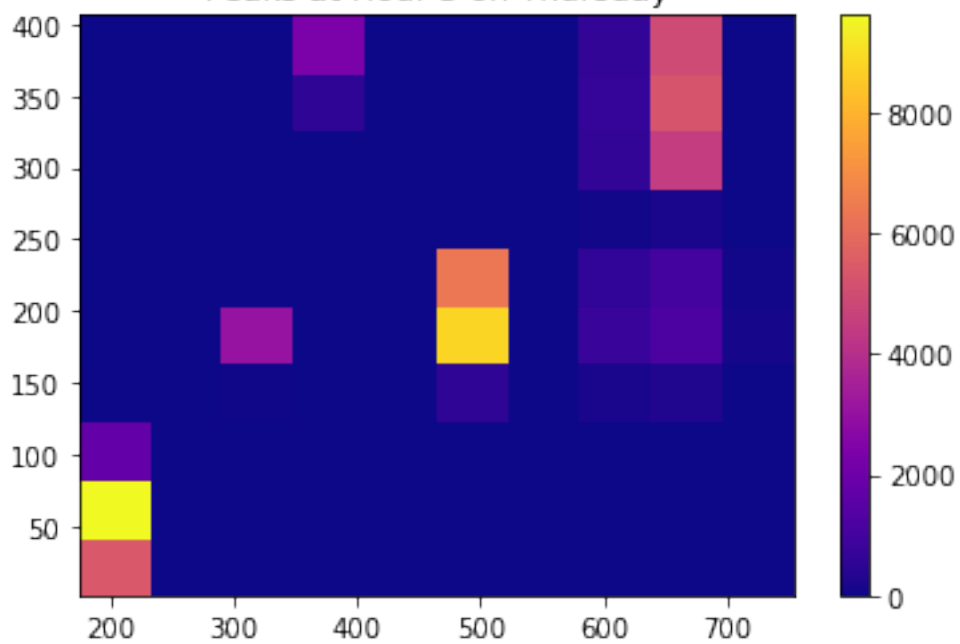
Peaks at Hour 1 on Thursday

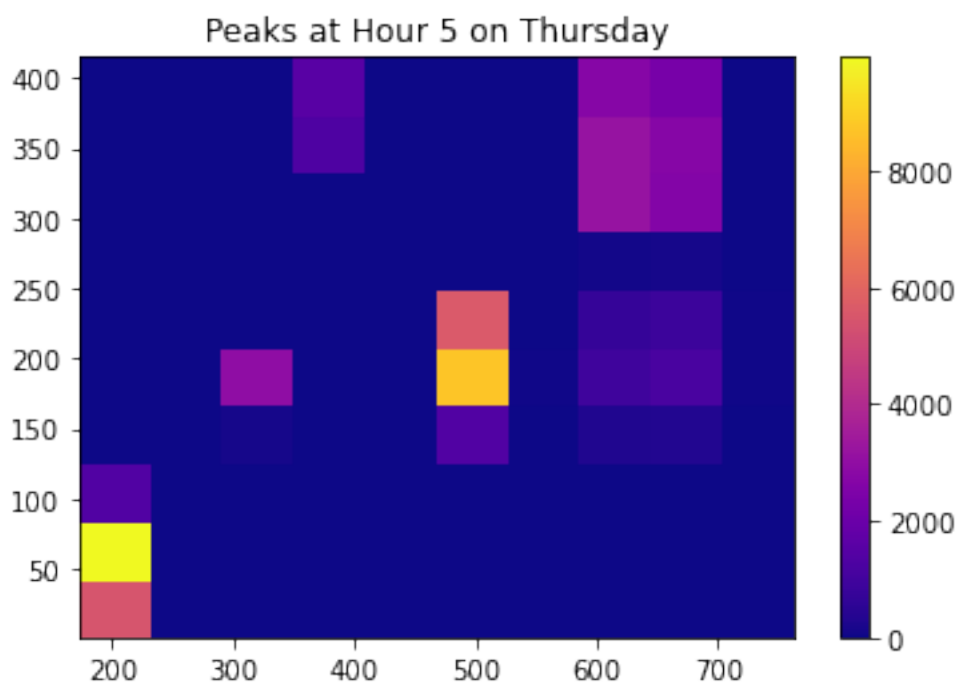
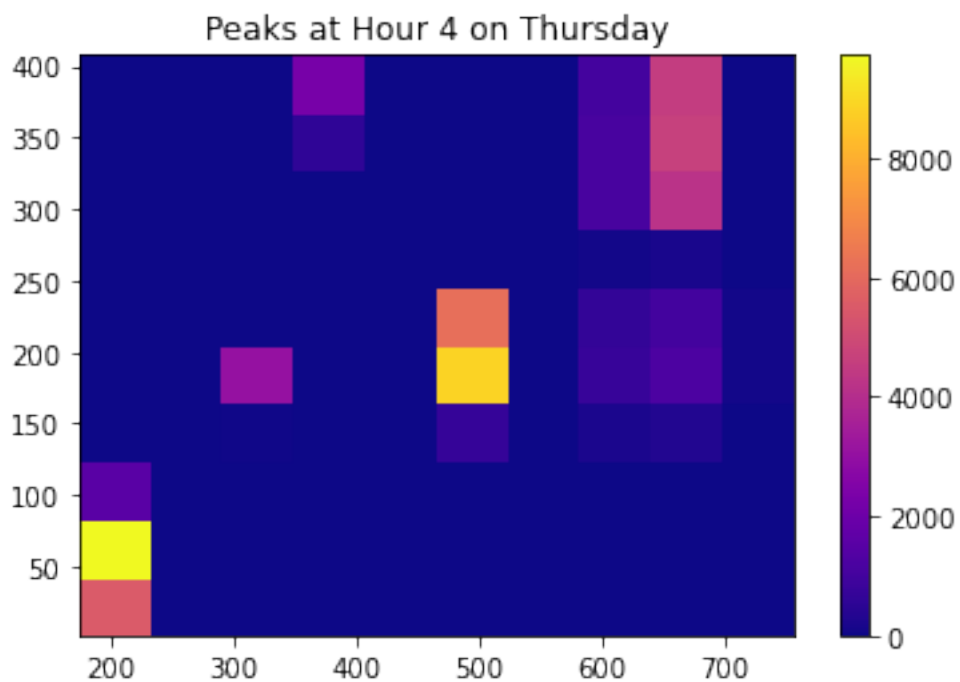


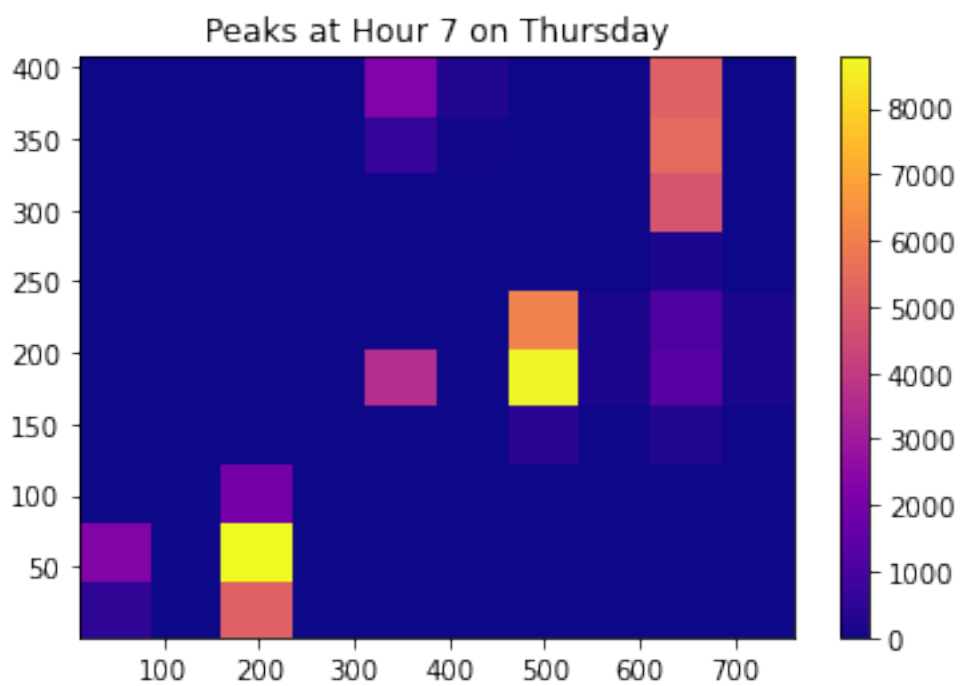
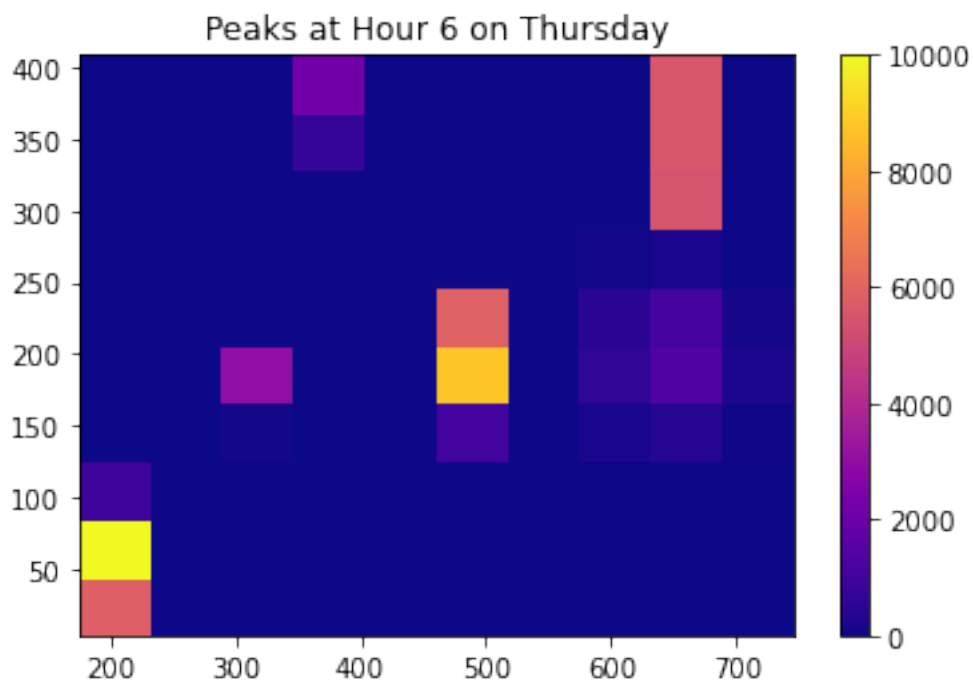
Peaks at Hour 2 on Thursday



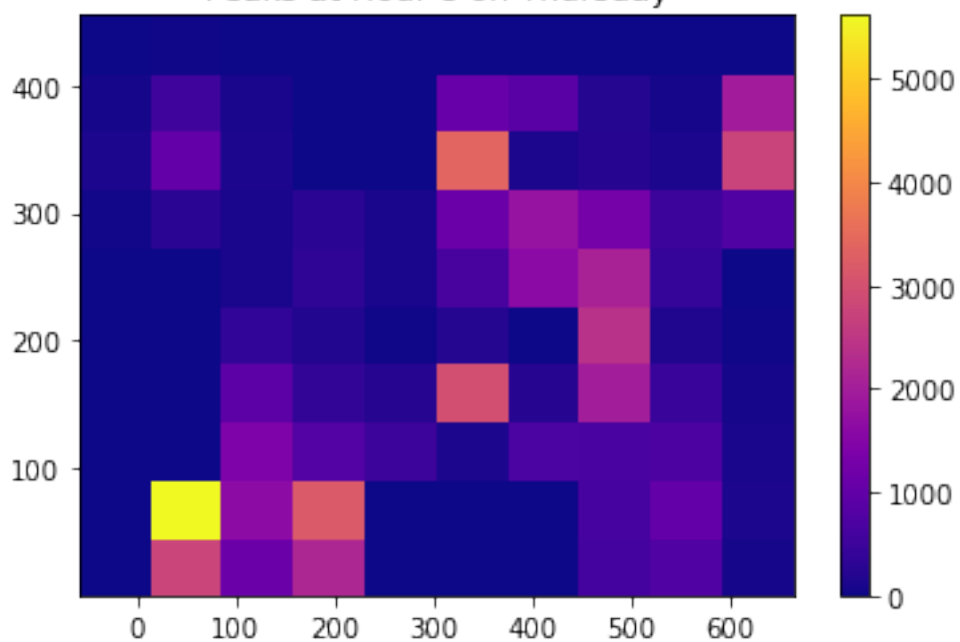
Peaks at Hour 3 on Thursday



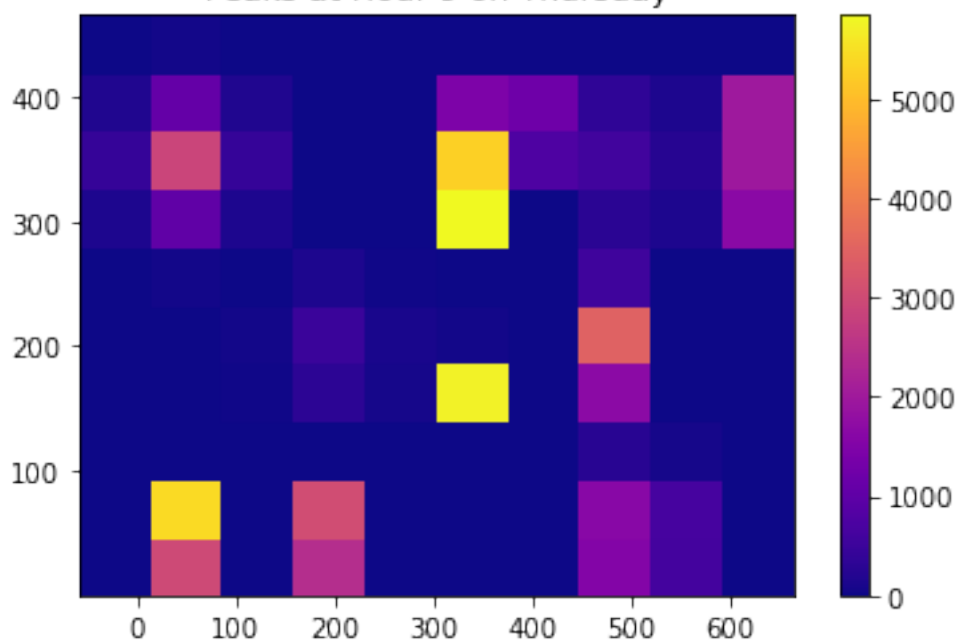




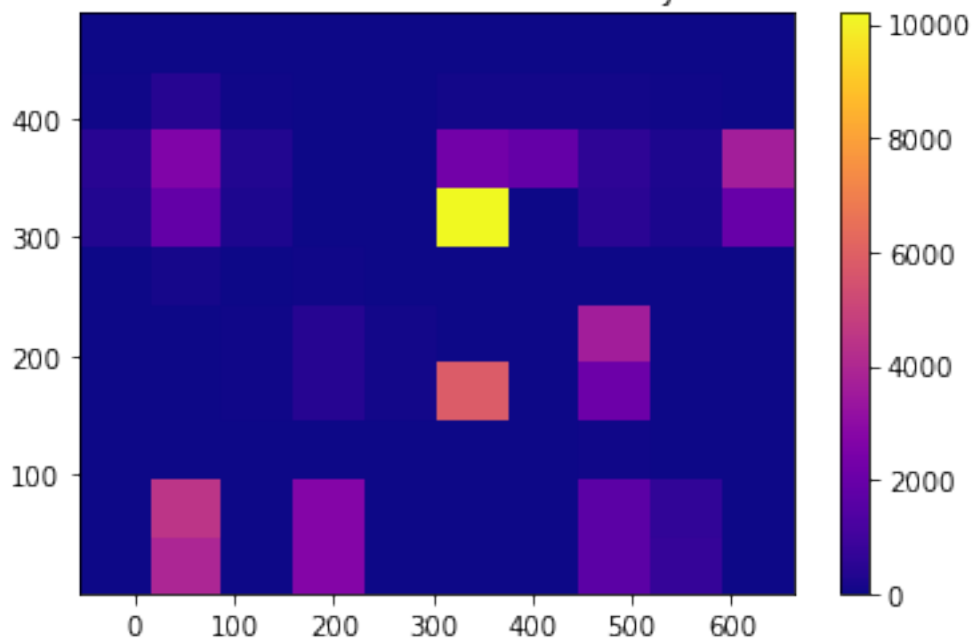
Peaks at Hour 8 on Thursday



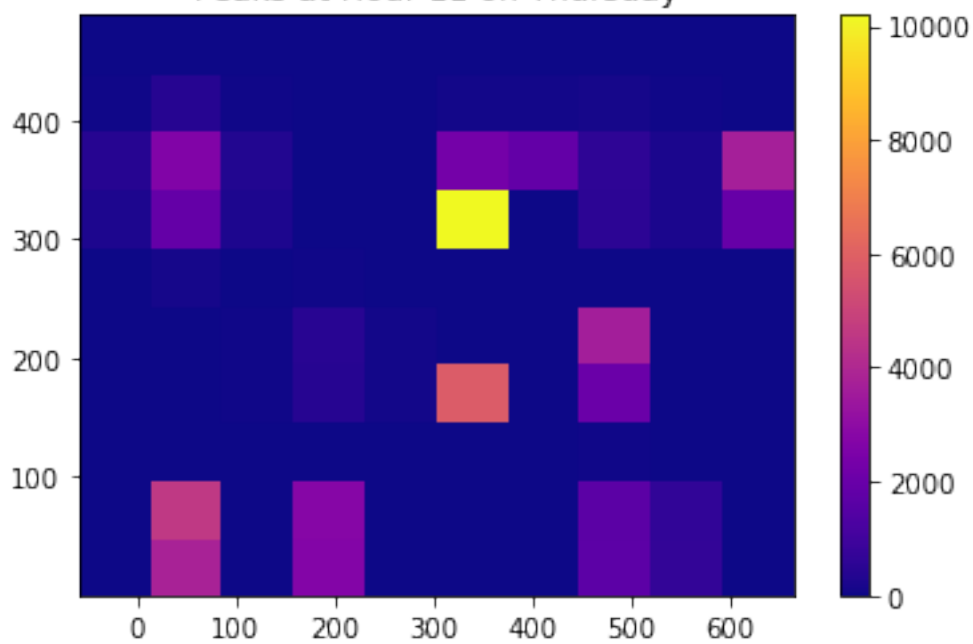
Peaks at Hour 9 on Thursday



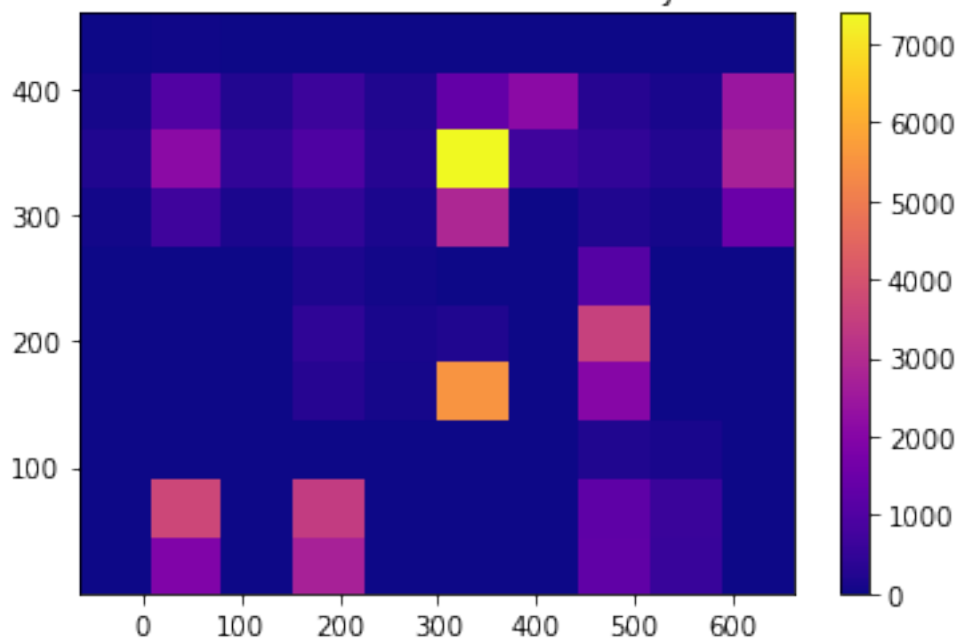
Peaks at Hour 10 on Thursday



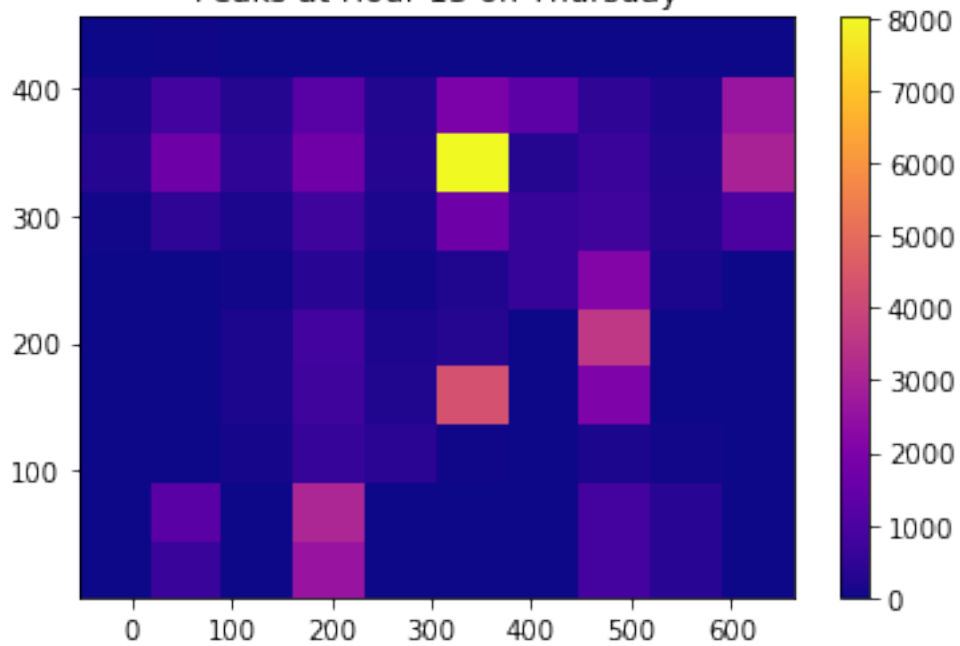
Peaks at Hour 11 on Thursday



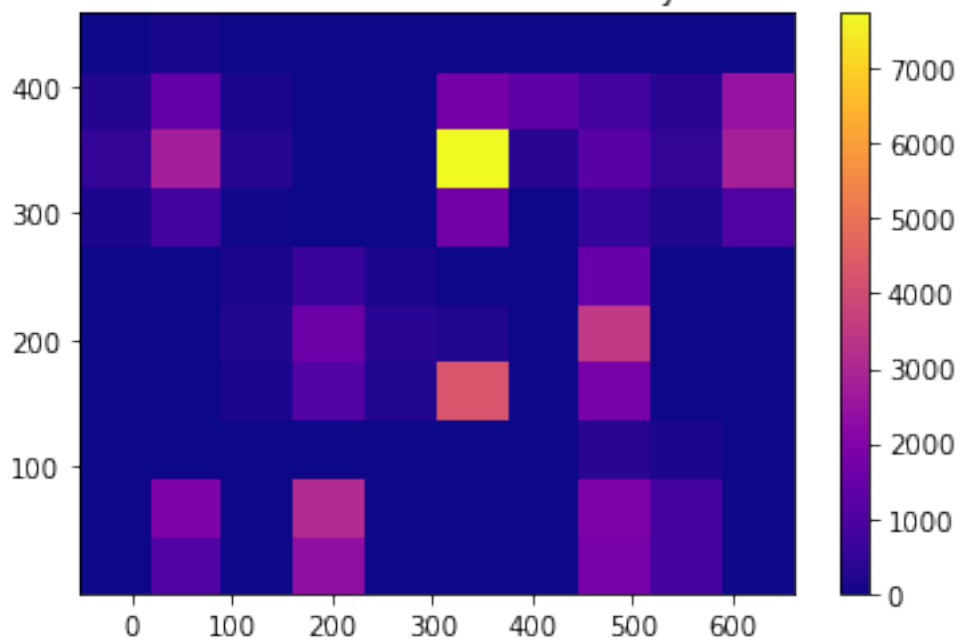
Peaks at Hour 12 on Thursday



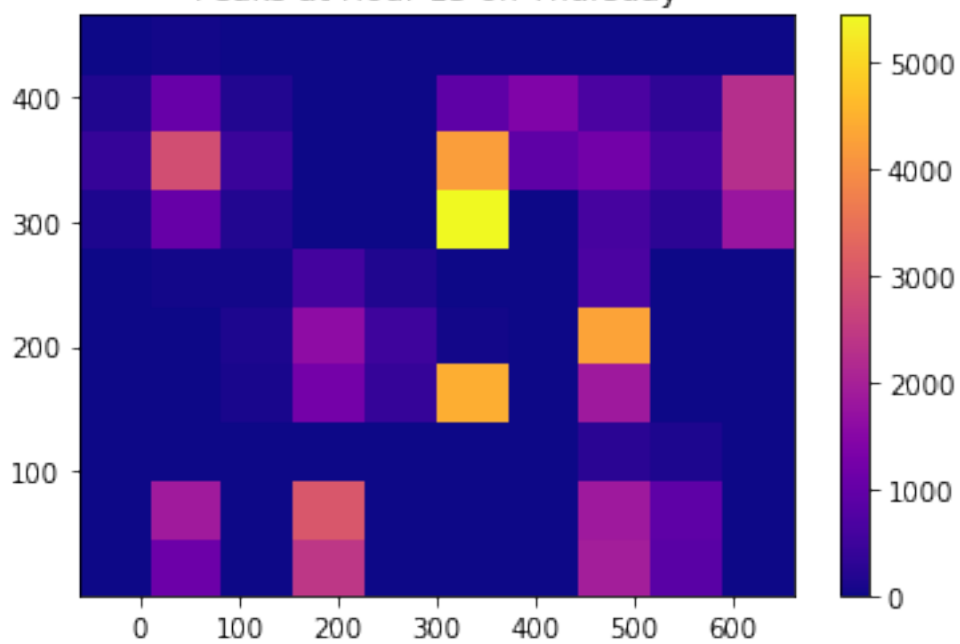
Peaks at Hour 13 on Thursday



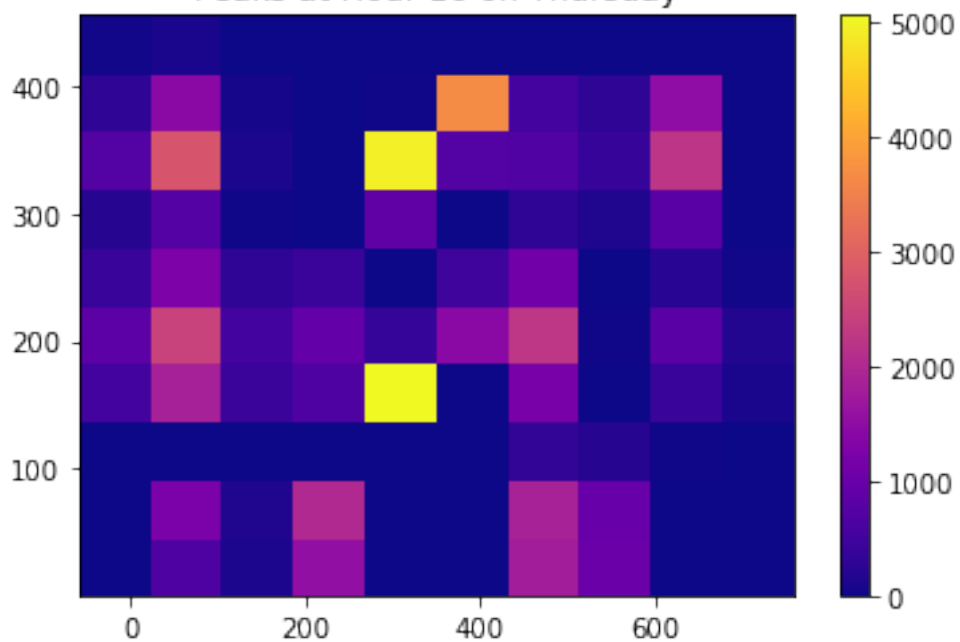
Peaks at Hour 14 on Thursday



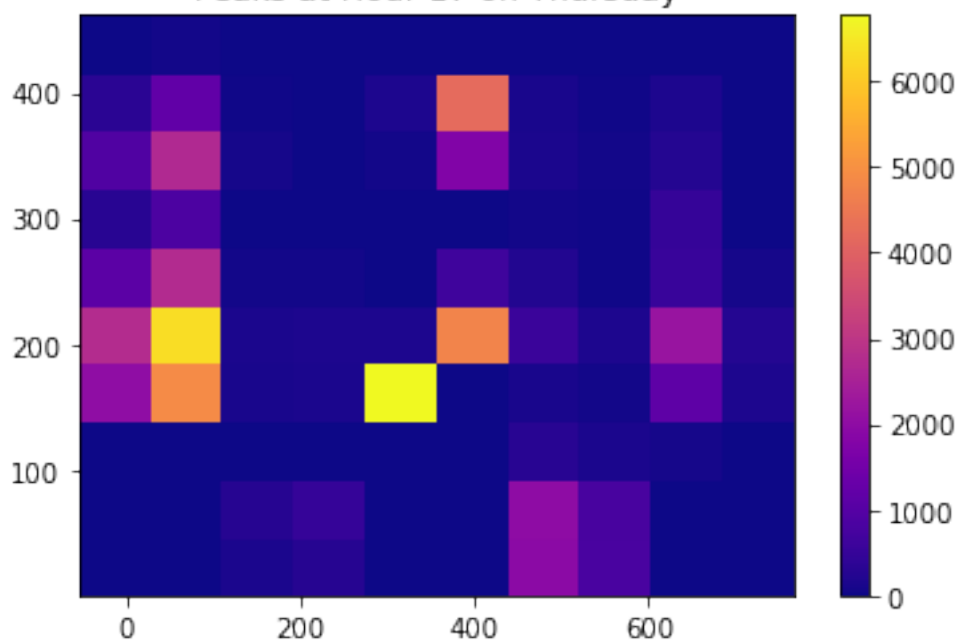
Peaks at Hour 15 on Thursday



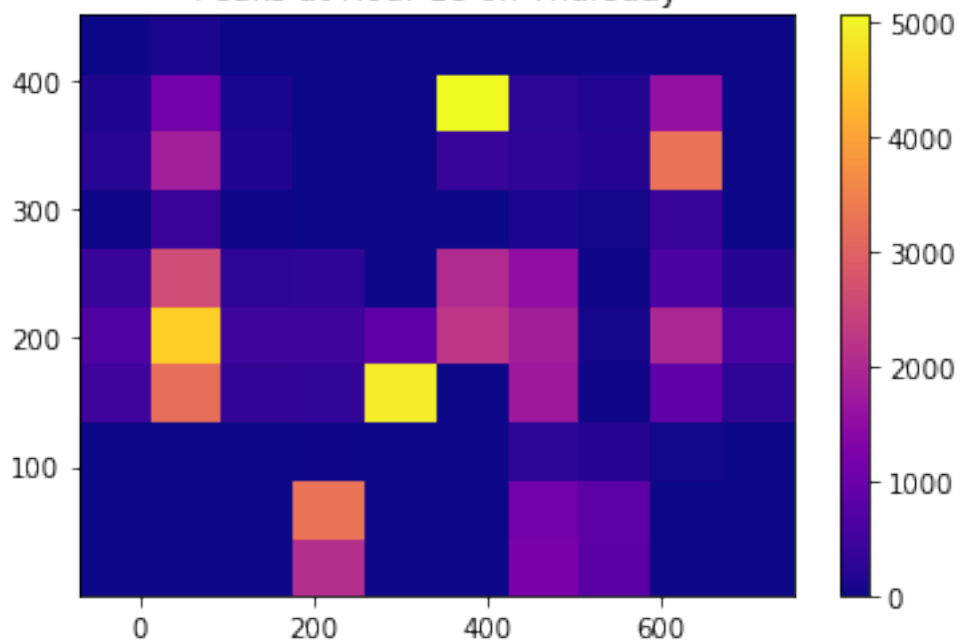
Peaks at Hour 16 on Thursday



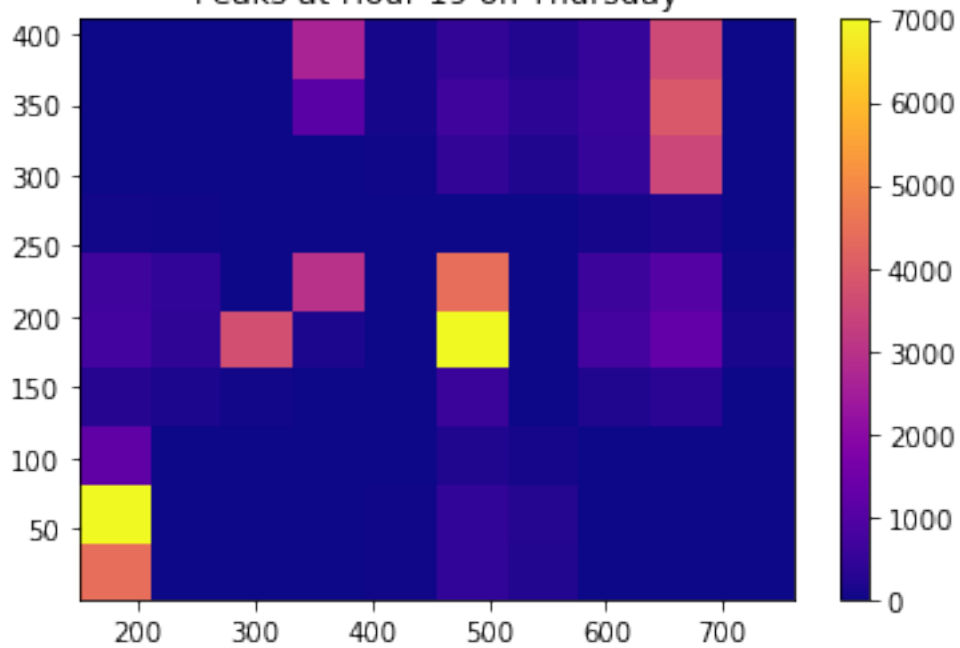
Peaks at Hour 17 on Thursday



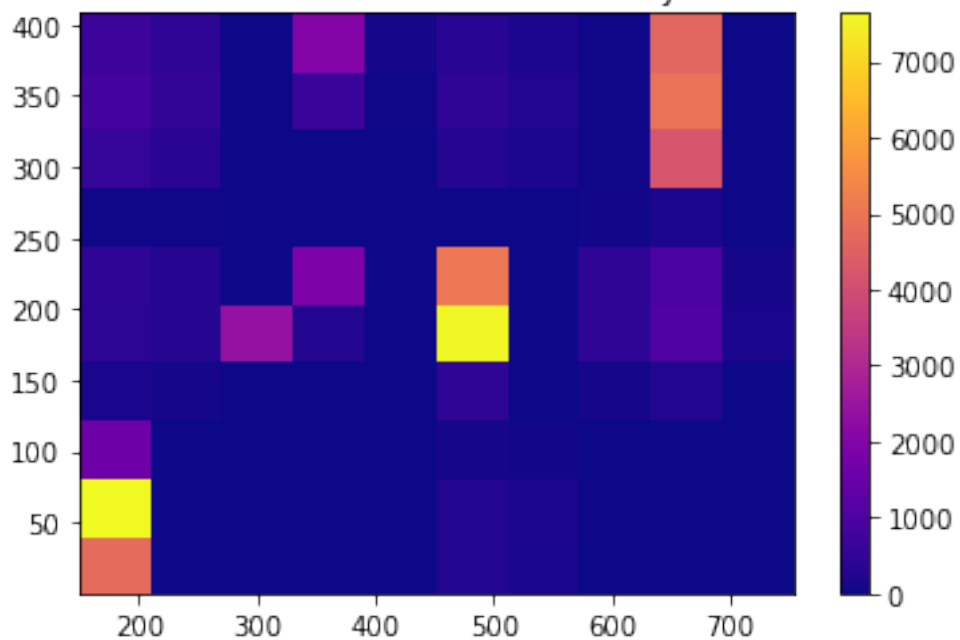
Peaks at Hour 18 on Thursday



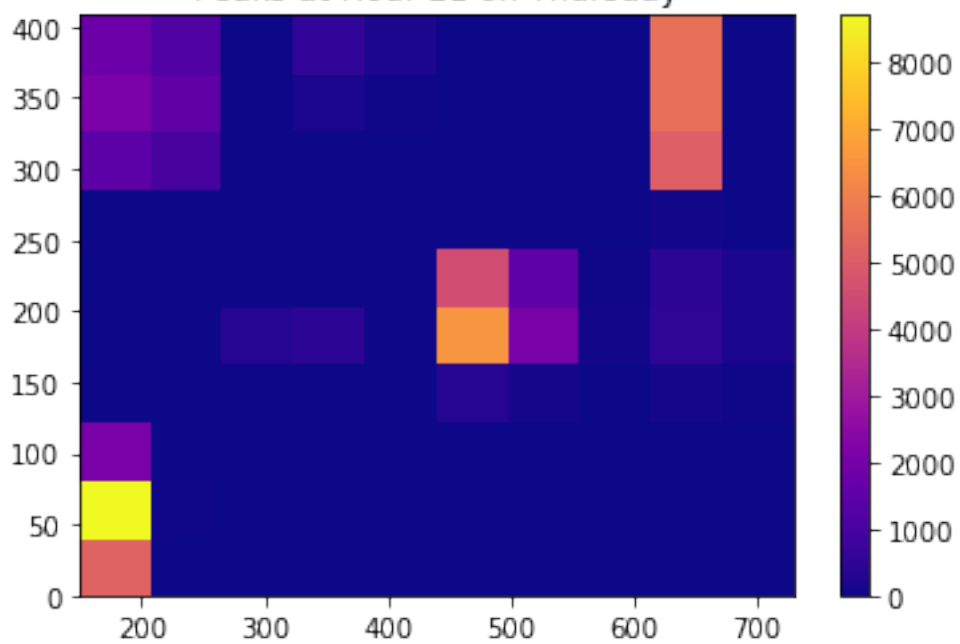
Peaks at Hour 19 on Thursday

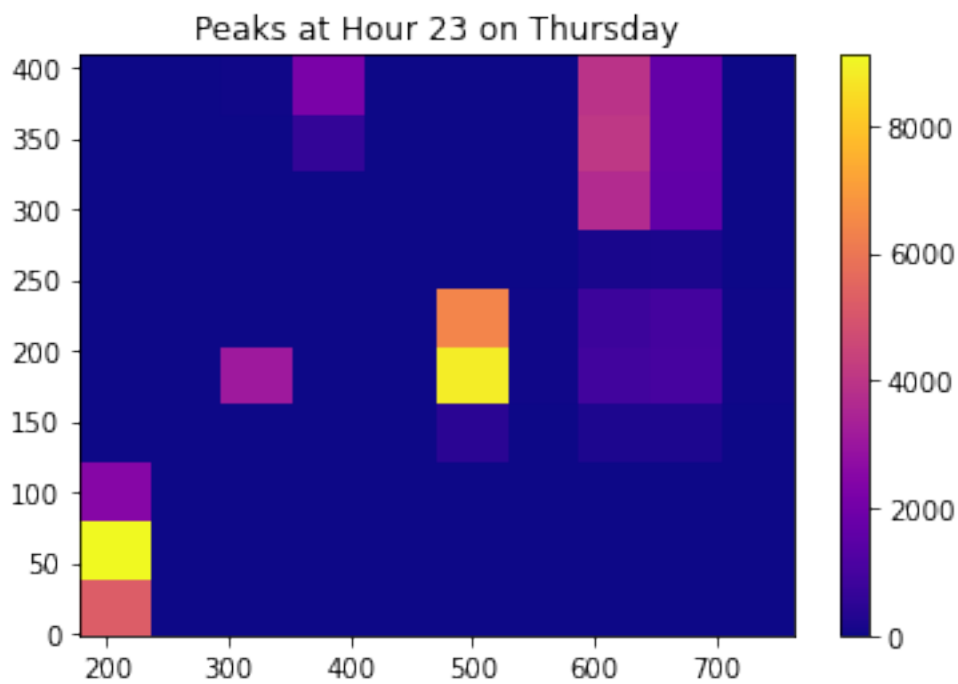
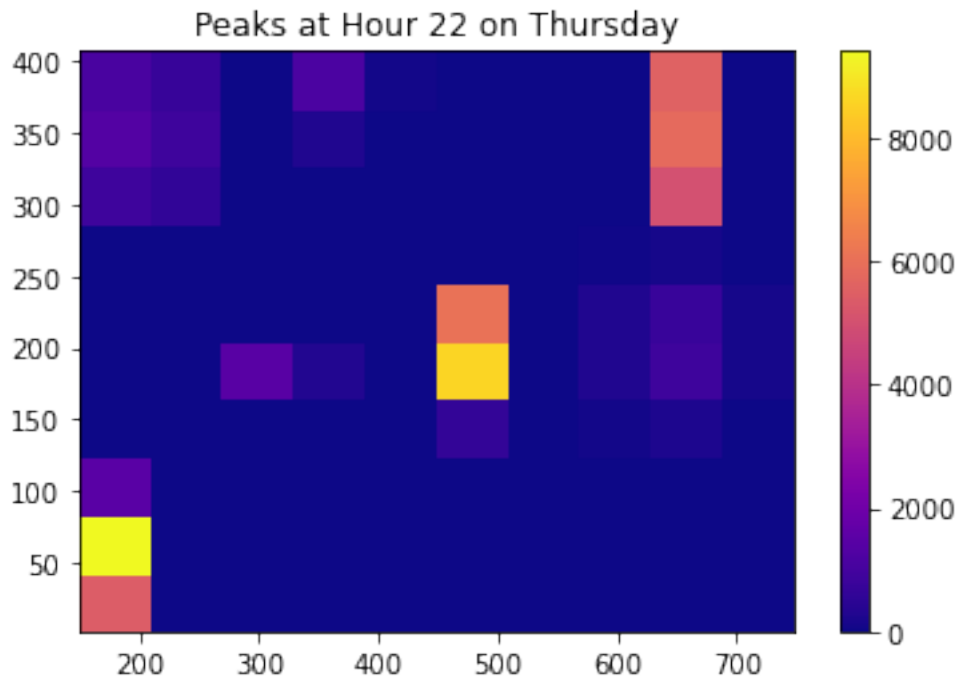


Peaks at Hour 20 on Thursday



Peaks at Hour 21 on Thursday





```
dataFriHourly=[]
for i in range(24):
    dataFriHourly.append(dataFri[dataFri['hour']==i])

rvfreq=[] for i in range(24)
Array_RV_freq=[] for i in range(24)
for i in range(24):
```

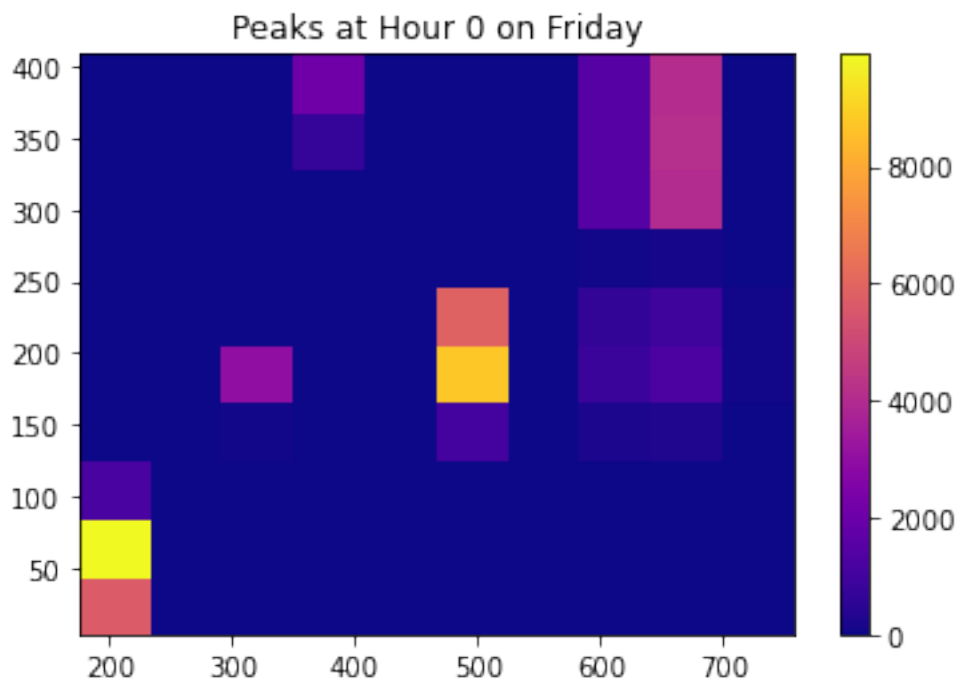
```

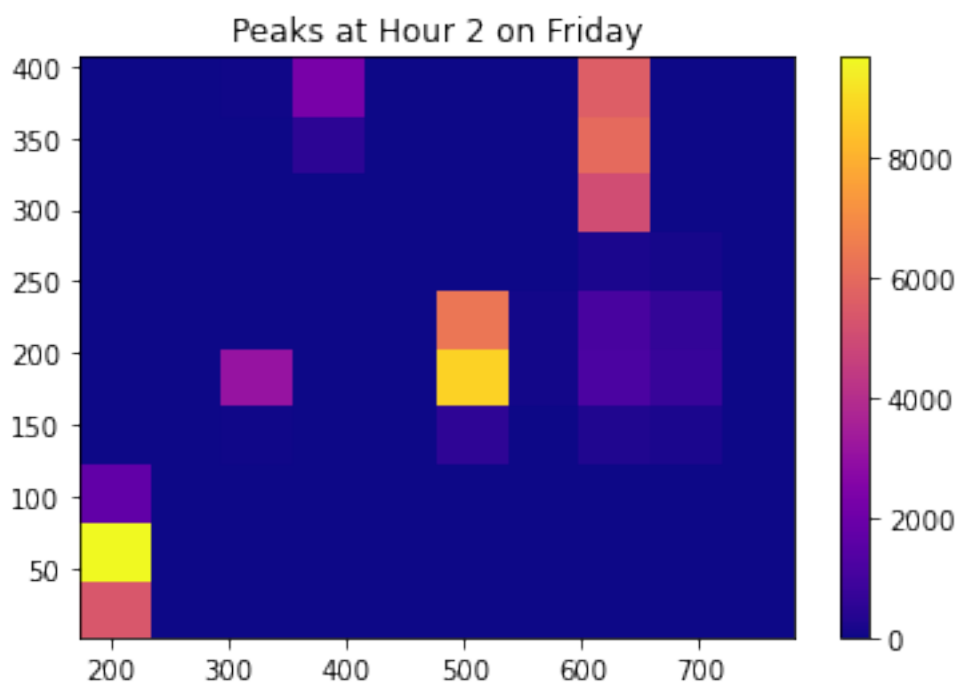
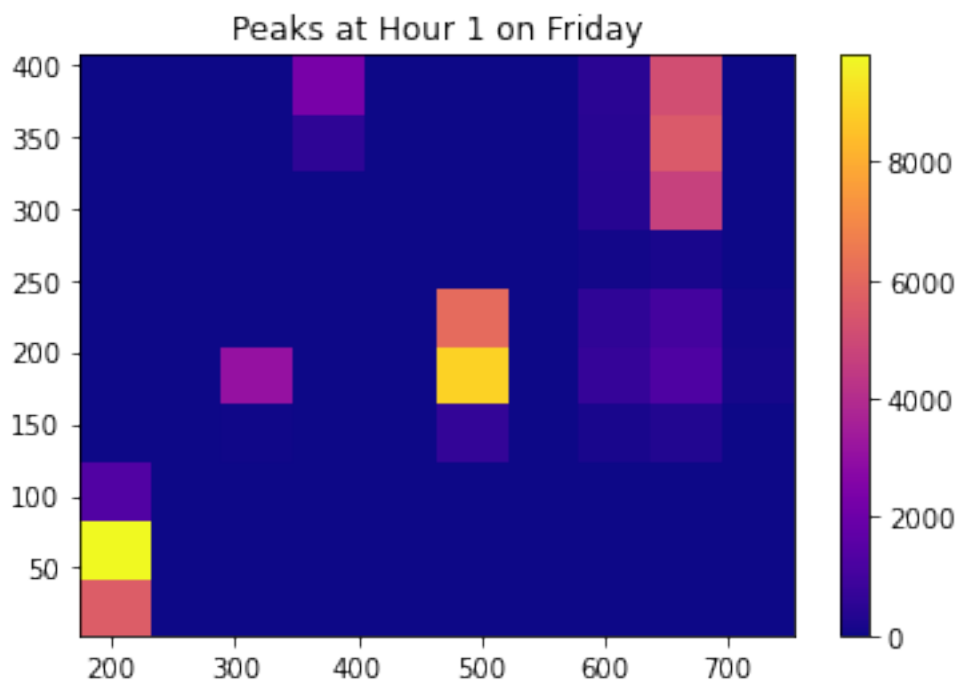
rvfreq[i]=np.linspace(min(dataFriHourly[i].X),max(dataFriHourly[i].X),
12)
    for j in range(1,len(rvfreq[i])):
        rv=[]
        rv=dataFriHourly[i][(dataFriHourly[i].X >= rvfreq[i][j-1]) &
(dataFriHourly[i].X >= rvfreq[i][j])]
        Array_RV_freq[i].append(len(rv))

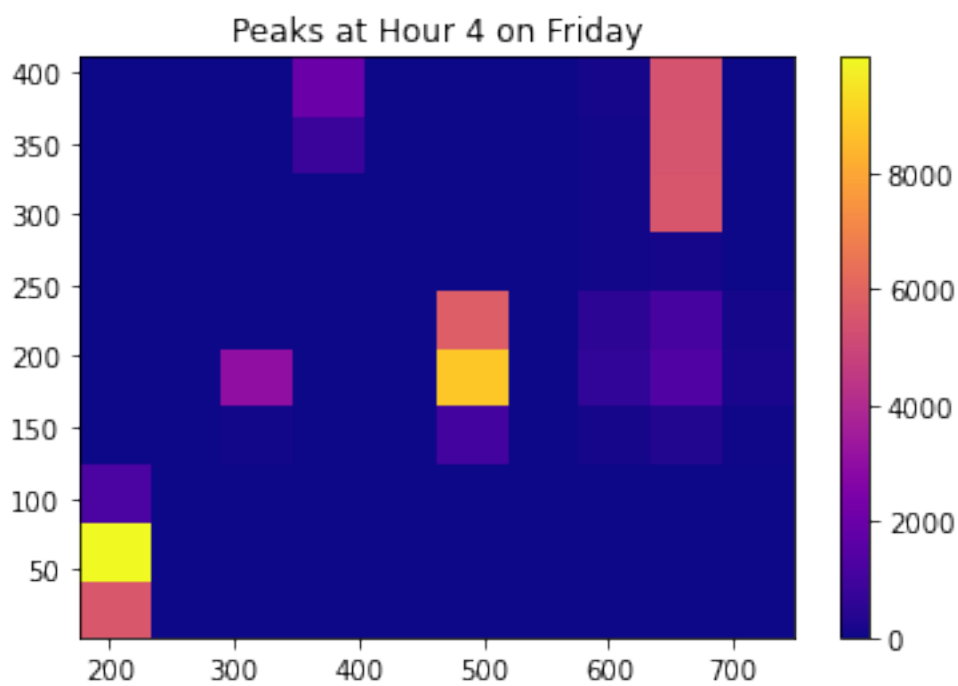
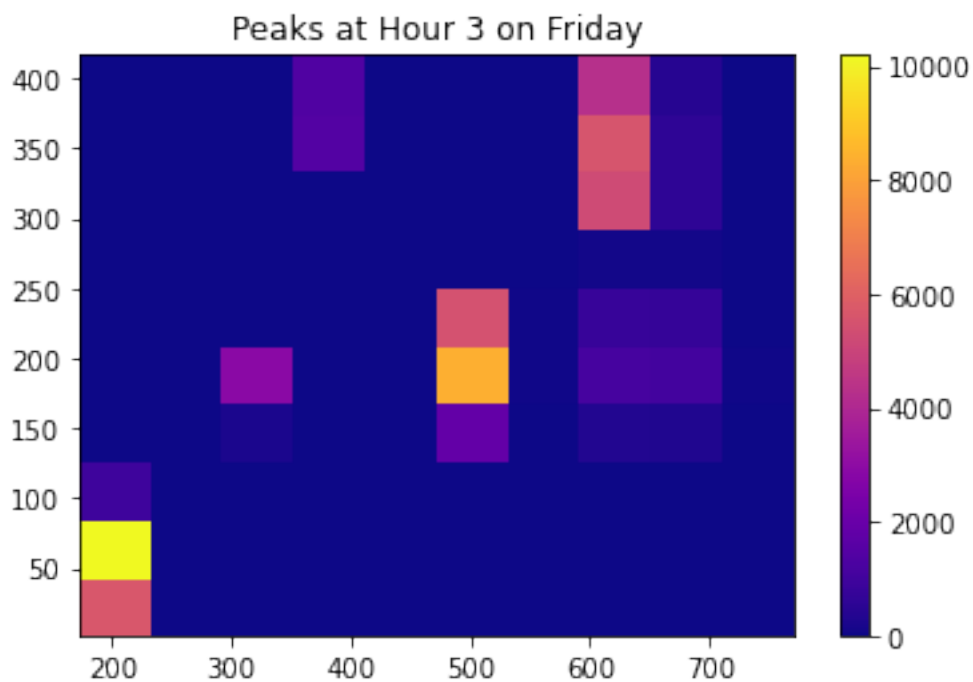
for i in range(24):

plt.hist2d(dataFriHourly[i].X,dataFriHourly[i].Y,cmap=plt.cm.plasma)
plt.title(f'Peaks at Hour {i} on Friday')
plt.colorbar()
plt.show()

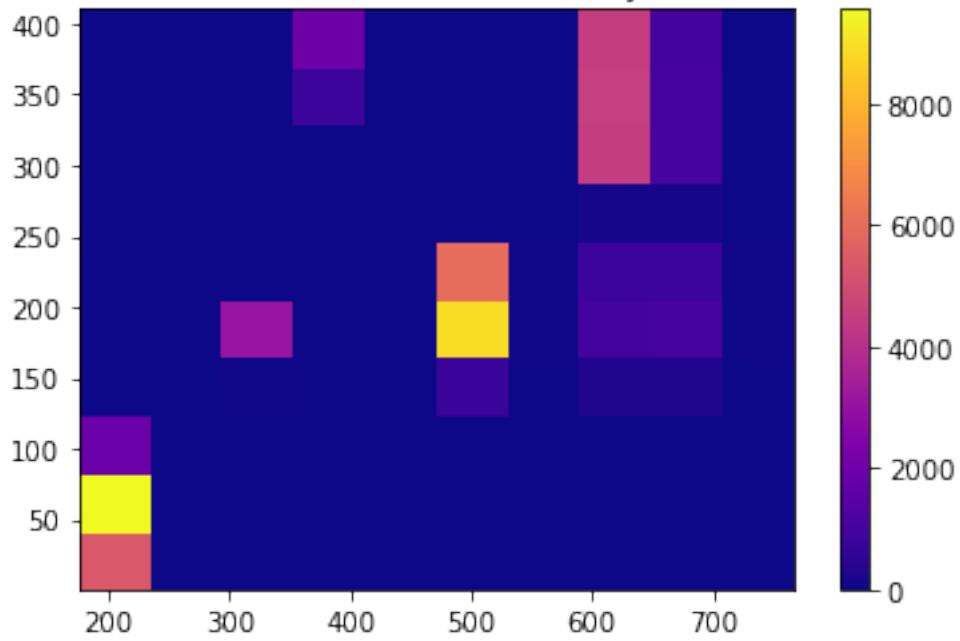
```



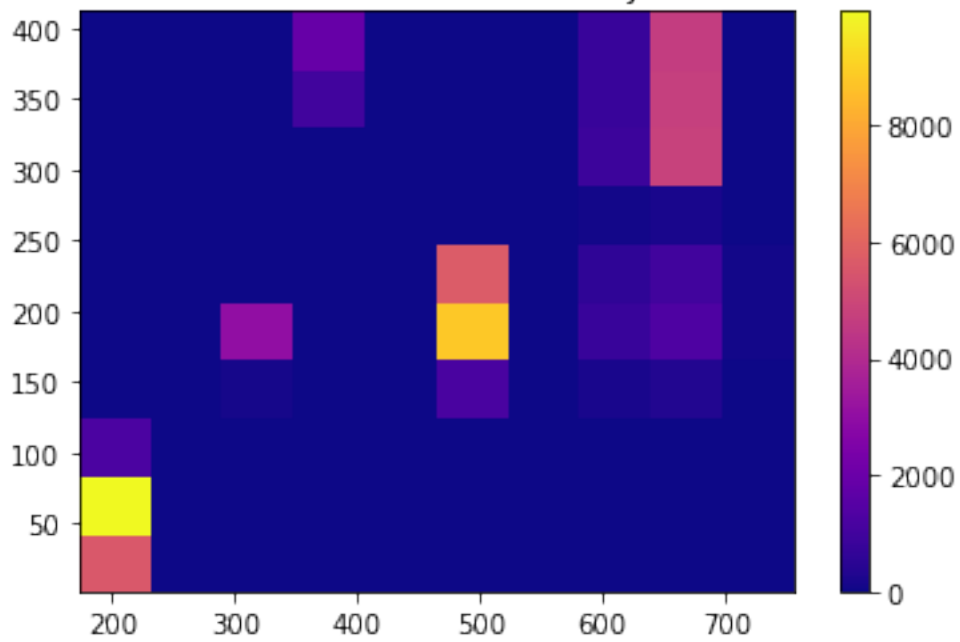




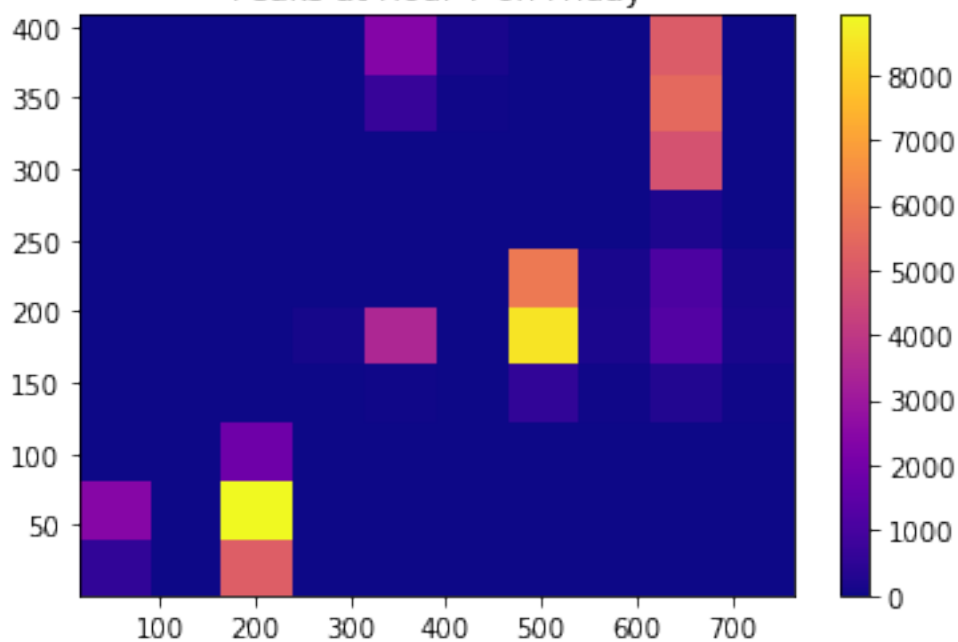
Peaks at Hour 5 on Friday



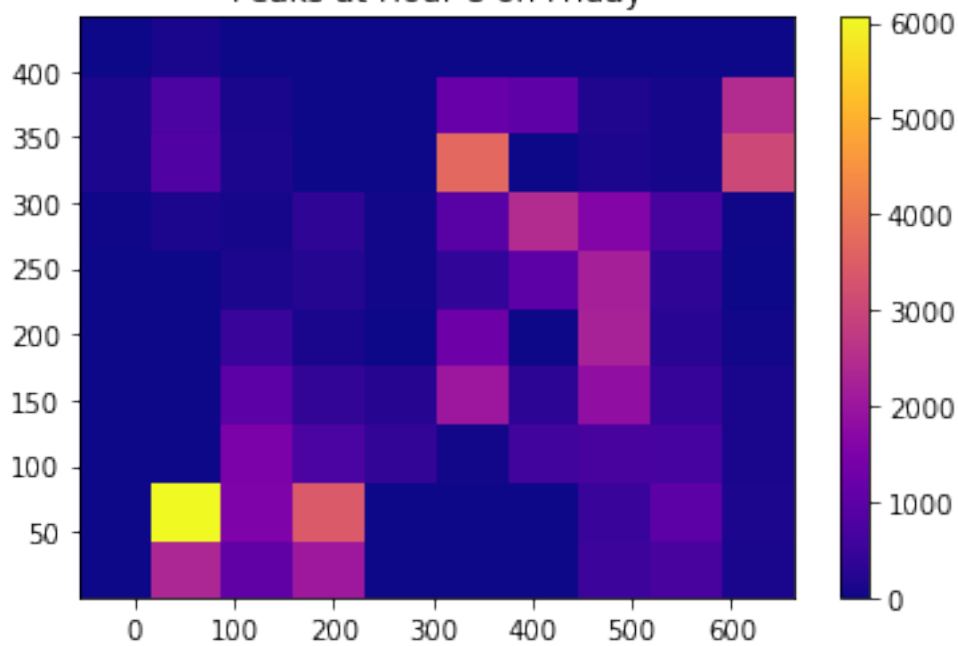
Peaks at Hour 6 on Friday



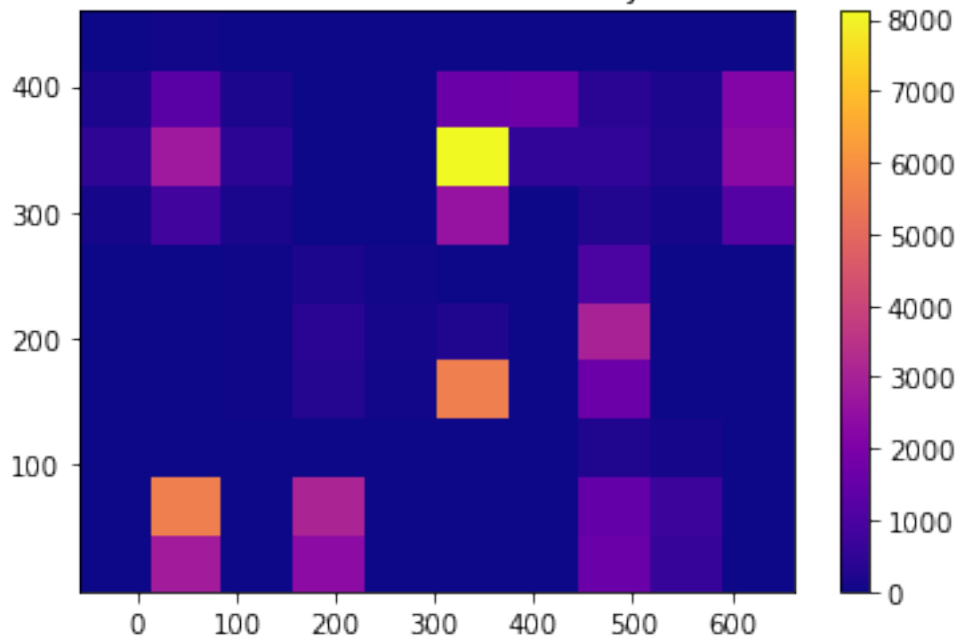
Peaks at Hour 7 on Friday



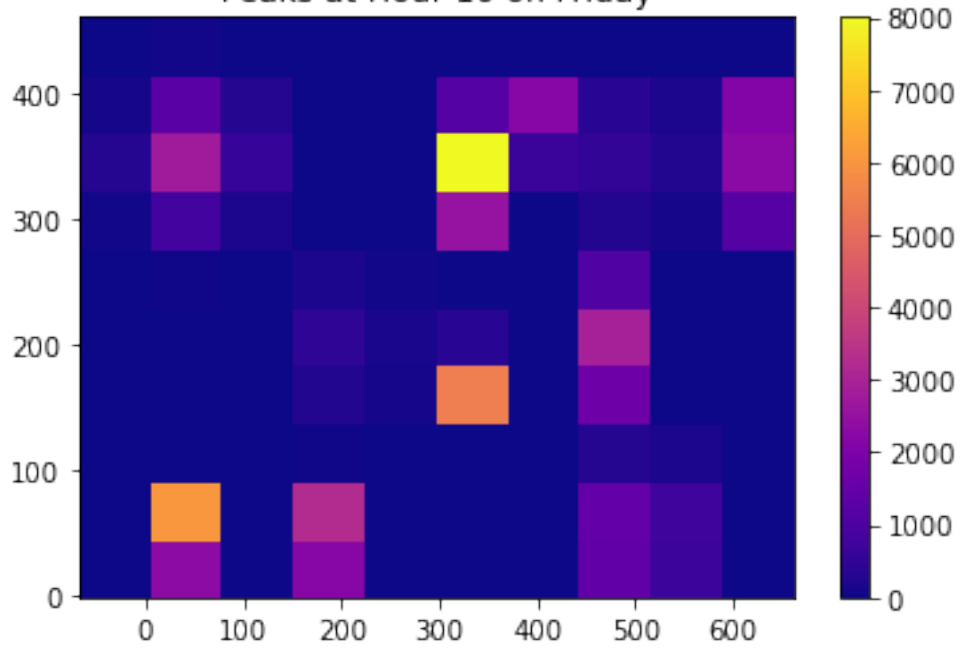
Peaks at Hour 8 on Friday



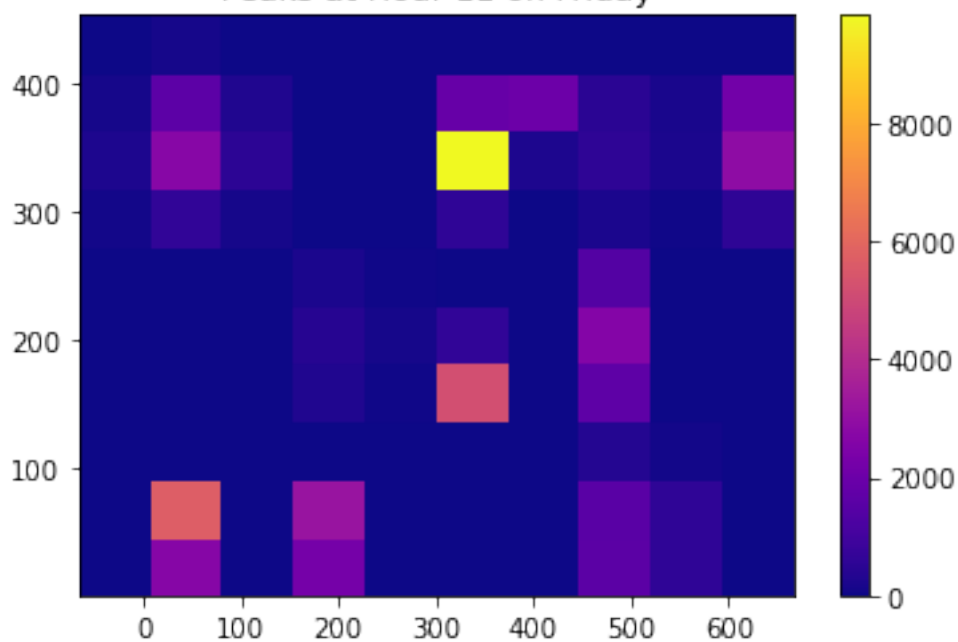
Peaks at Hour 9 on Friday



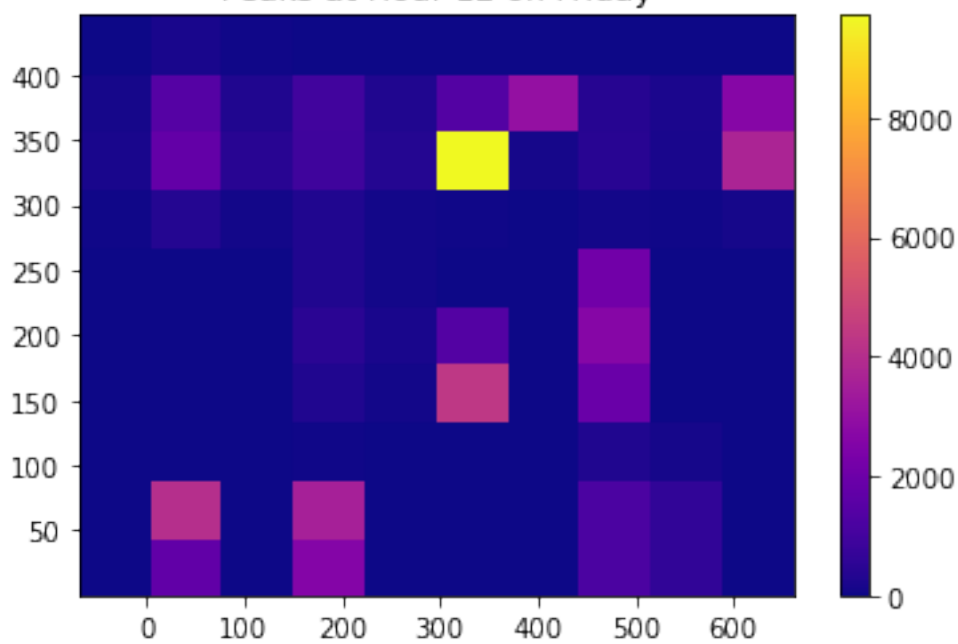
Peaks at Hour 10 on Friday



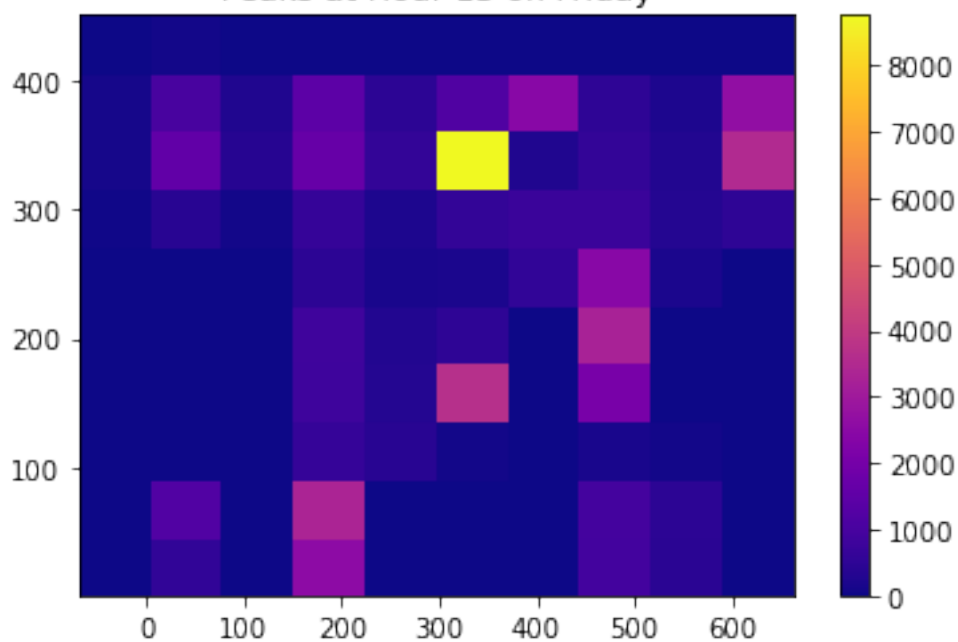
Peaks at Hour 11 on Friday



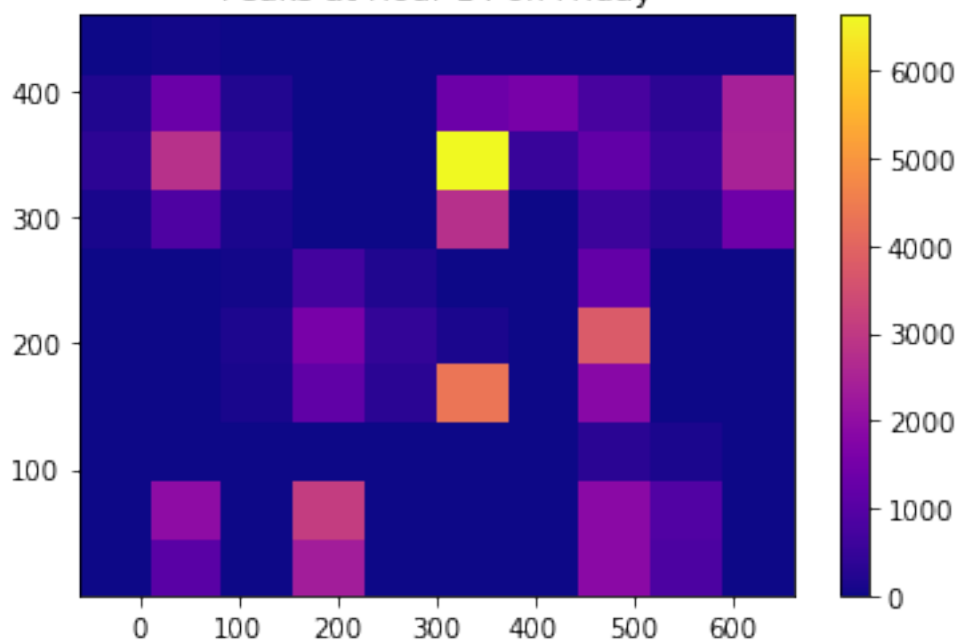
Peaks at Hour 12 on Friday



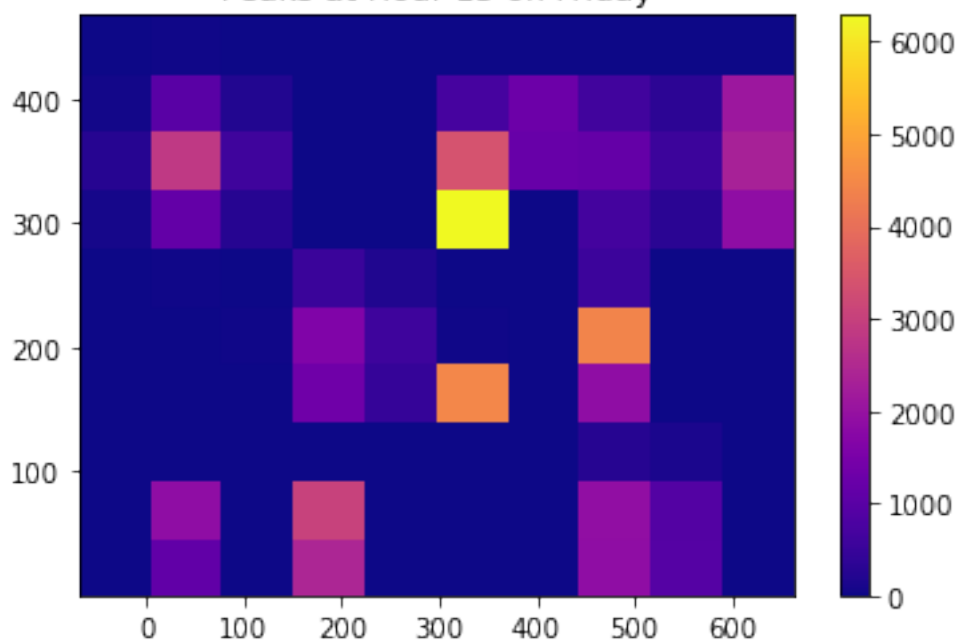
Peaks at Hour 13 on Friday



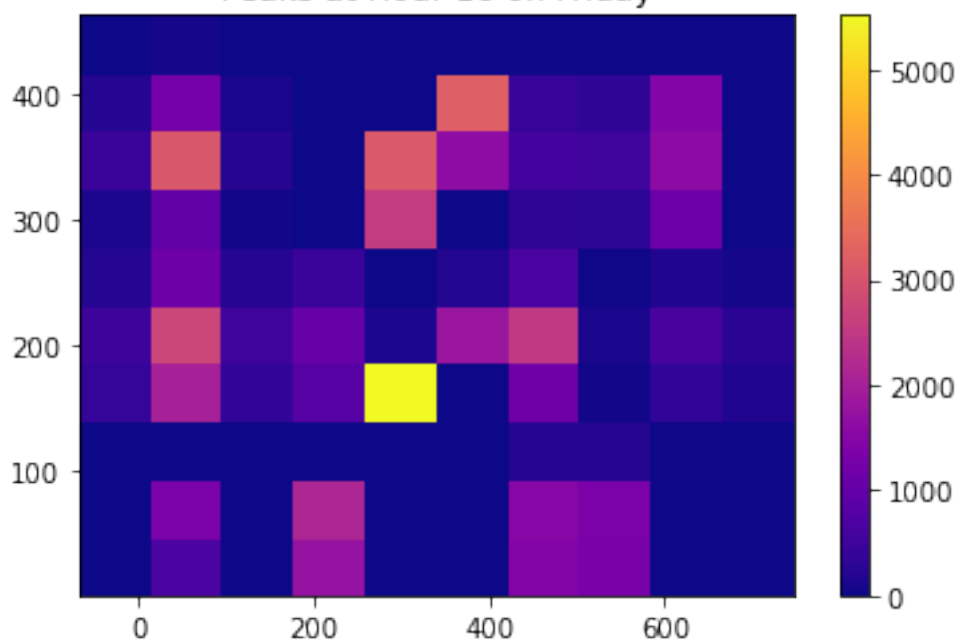
Peaks at Hour 14 on Friday



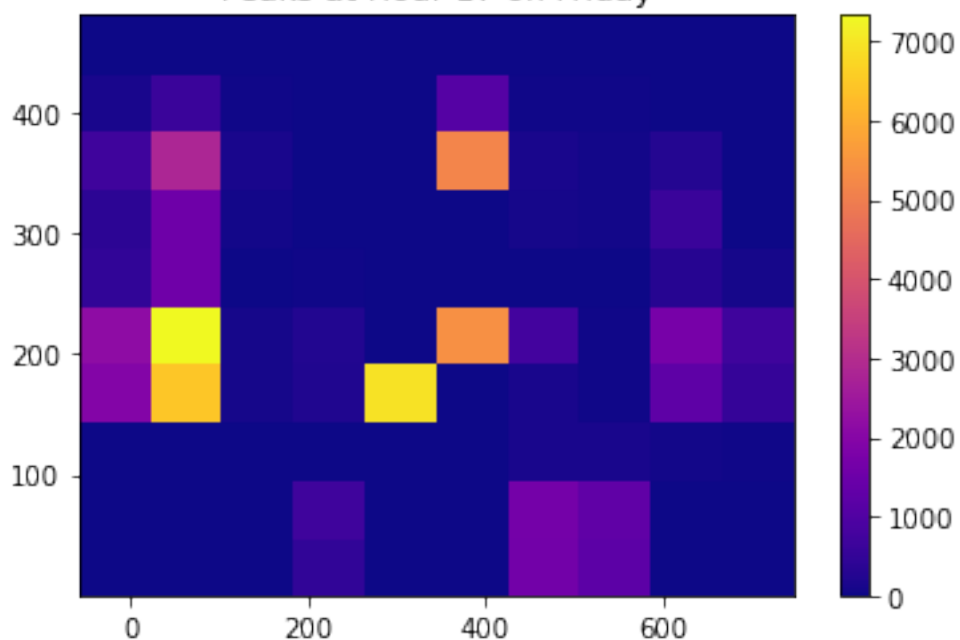
Peaks at Hour 15 on Friday



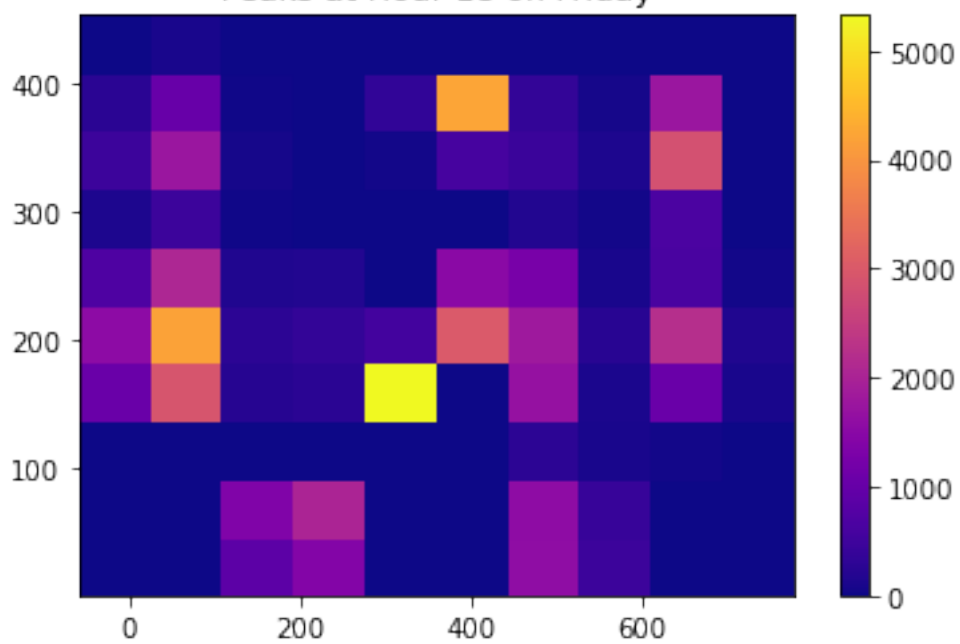
Peaks at Hour 16 on Friday



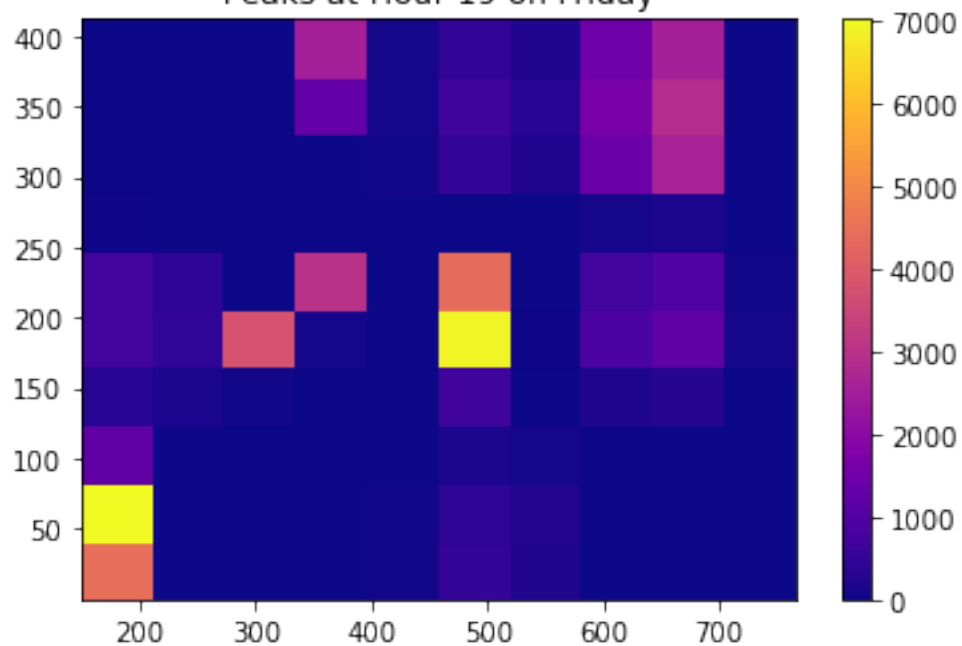
Peaks at Hour 17 on Friday



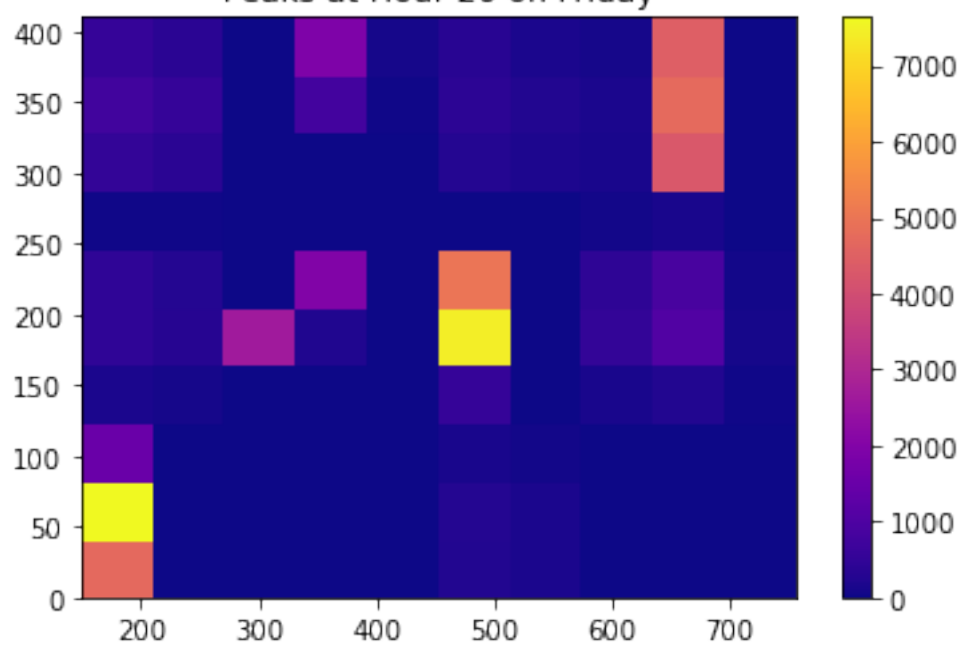
Peaks at Hour 18 on Friday

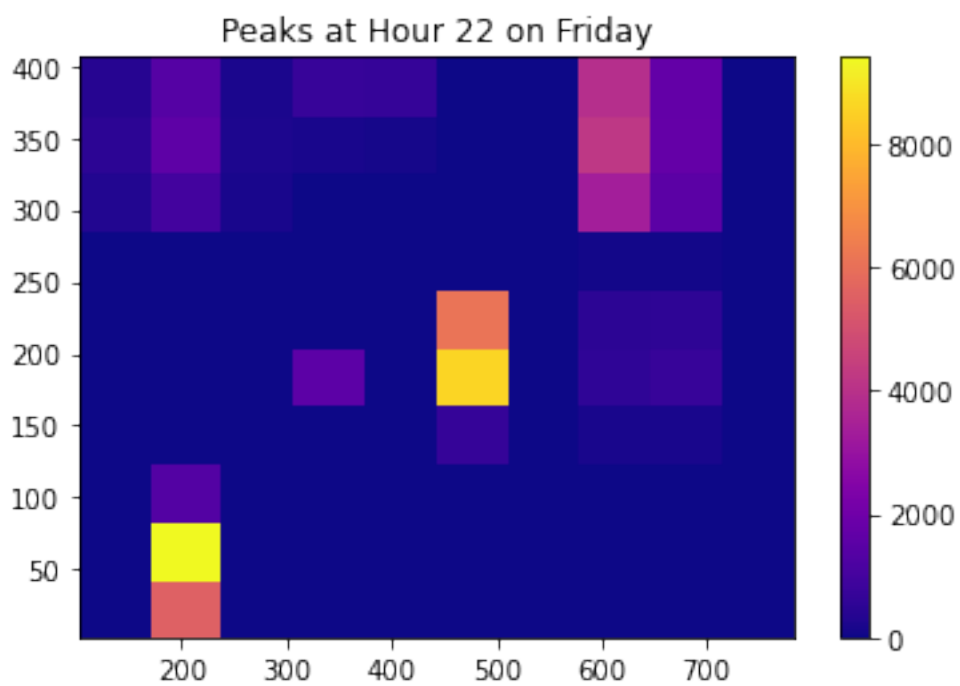
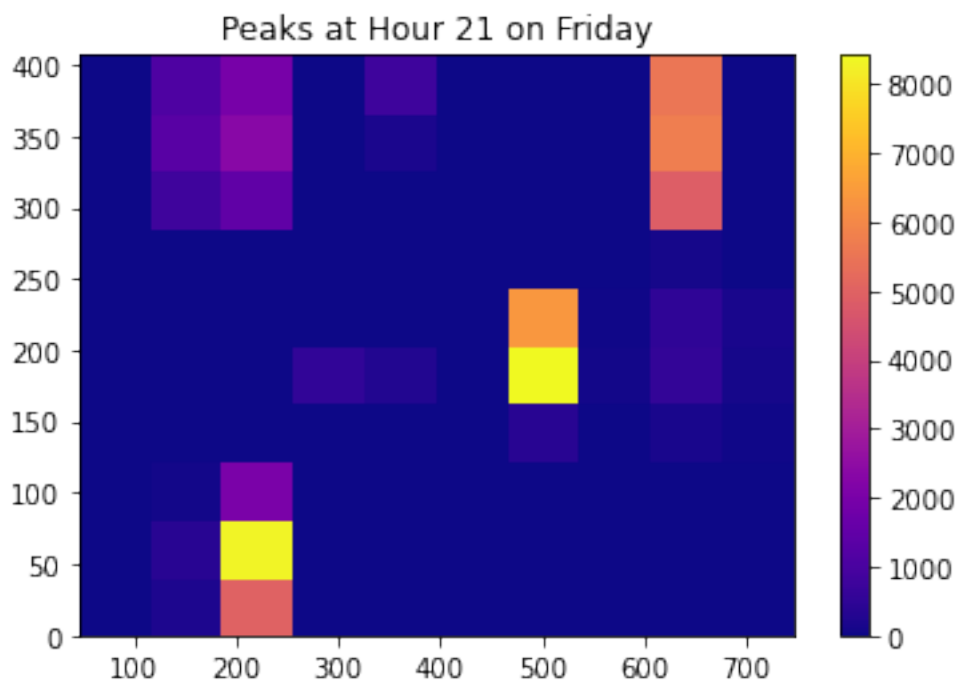


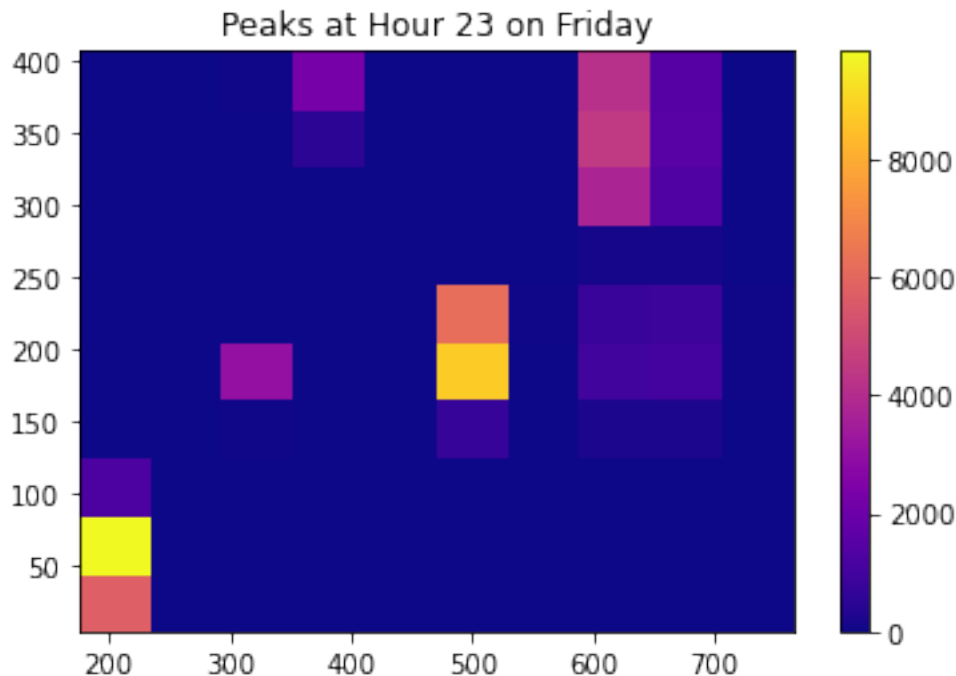
Peaks at Hour 19 on Friday



Peaks at Hour 20 on Friday







```

dataSatHourly=[]
for i in range(24):
    dataSatHourly.append(dataSat[dataSat['hour']==i])

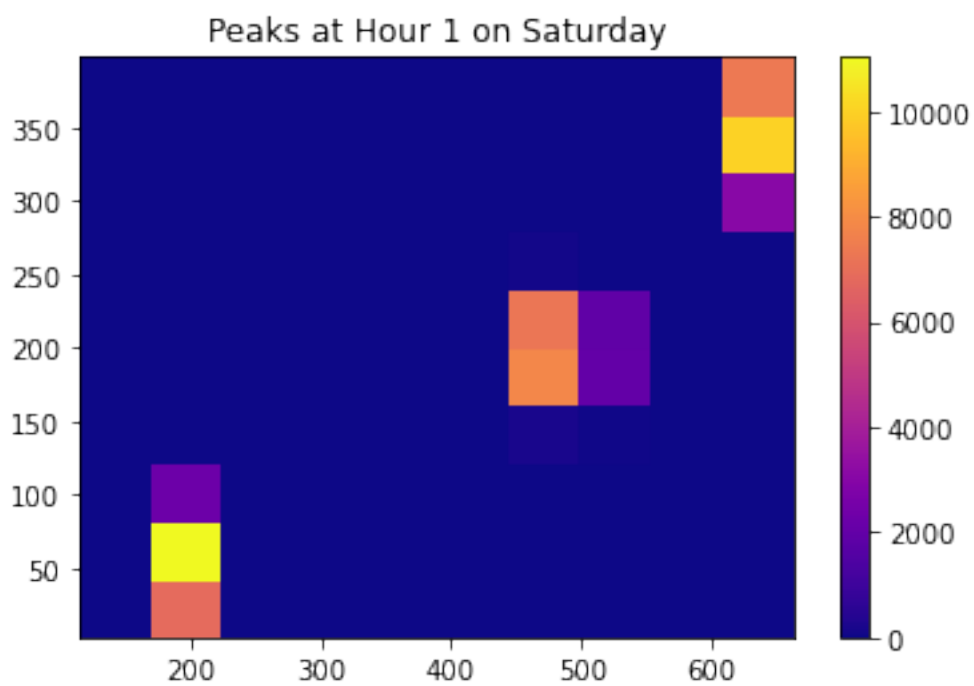
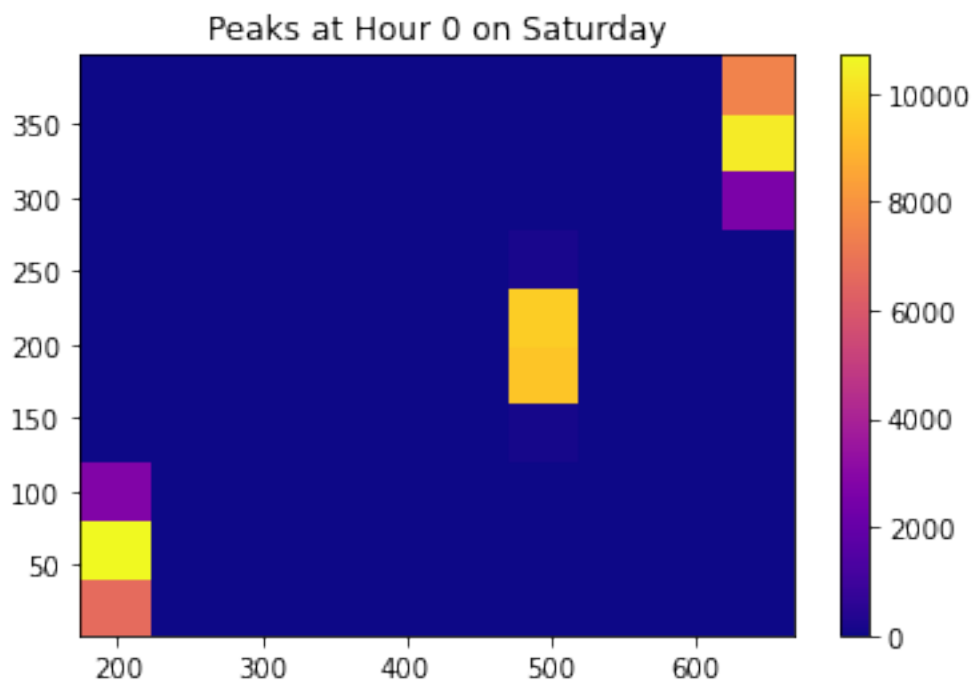
rvfreq=[] for i in range(24)]
Array_RV_freq=[] for i in range(24)]
for i in range(24):

    rvfreq[i]=np.linspace(min(dataSatHourly[i].X),max(dataSatHourly[i].X),
12)
    for j in range(1,len(rvfreq[i])):
        rv=[]
        rv=dataSatHourly[i][(dataSatHourly[i].X >= rvfreq[i][j-1]) &
(dataSatHourly[i].X >= rvfreq[i][j])]
        Array_RV_freq[i].append(len(rv))

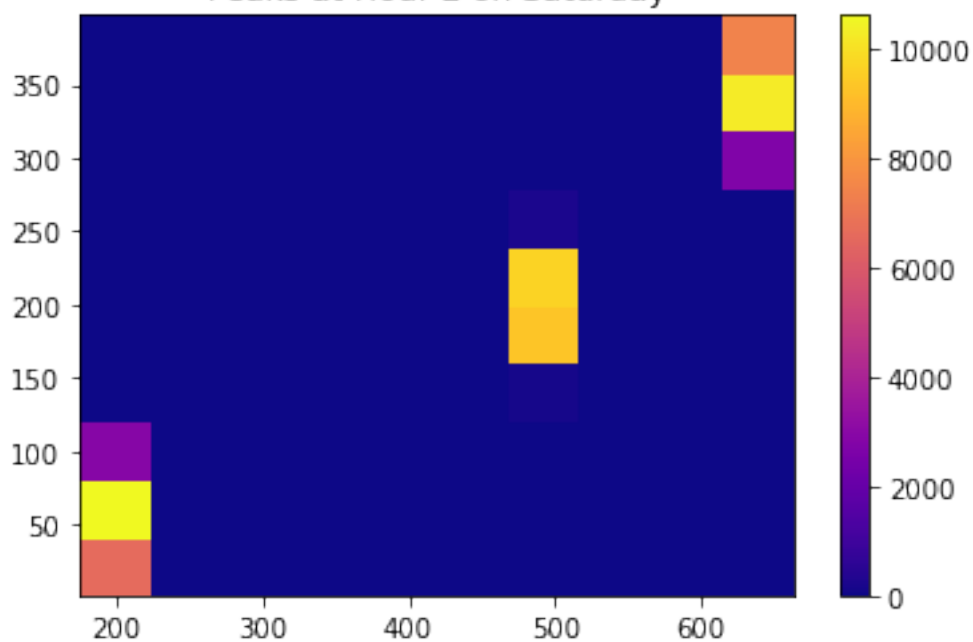
for i in range(24):

plt.hist2d(dataSatHourly[i].X,dataSatHourly[i].Y,cmap=plt.cm.plasma)
plt.title(f'Peaks at Hour {i} on Saturday')
plt.colorbar()
plt.show()

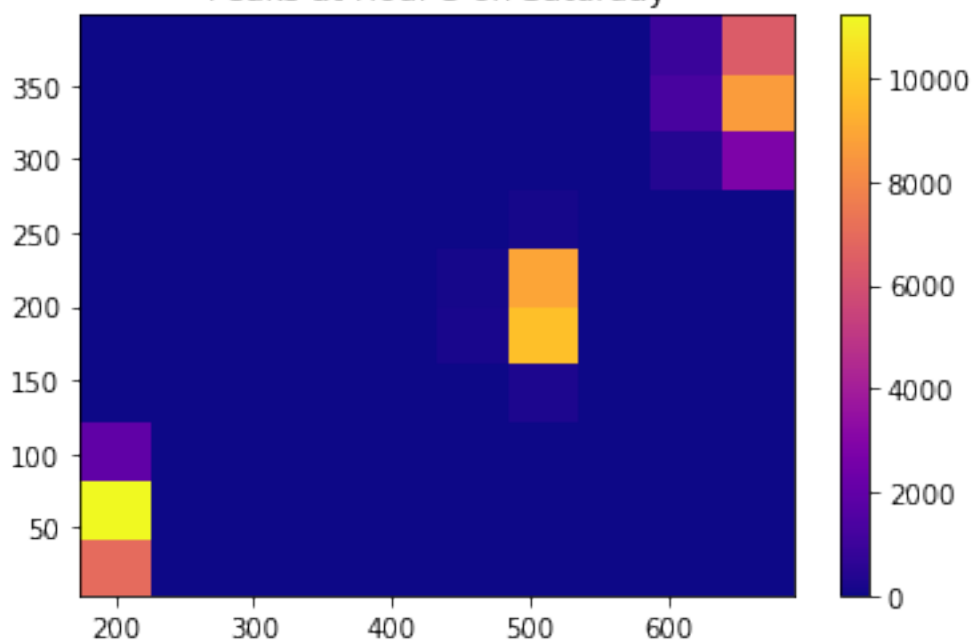
```



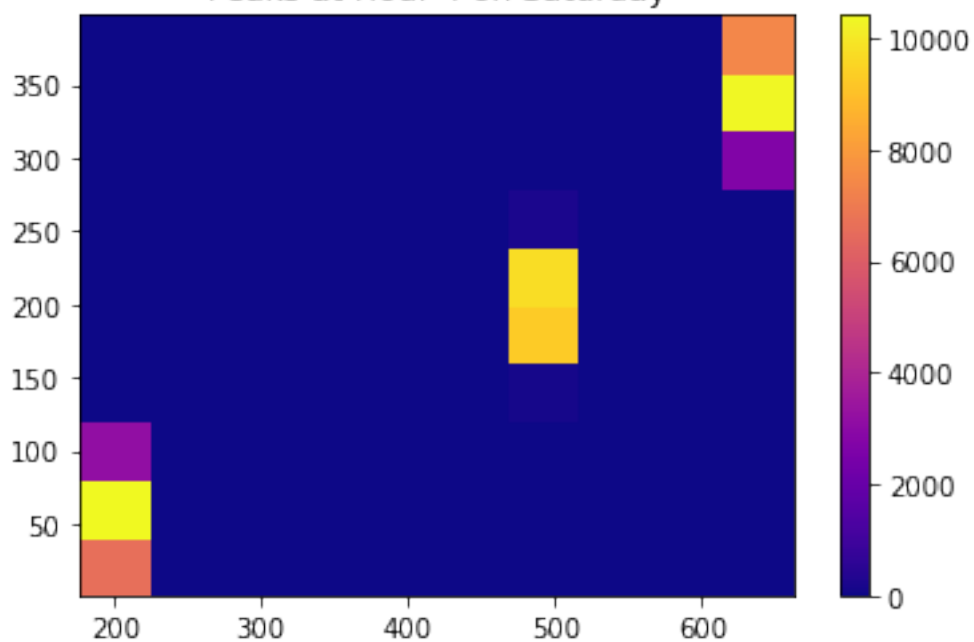
Peaks at Hour 2 on Saturday



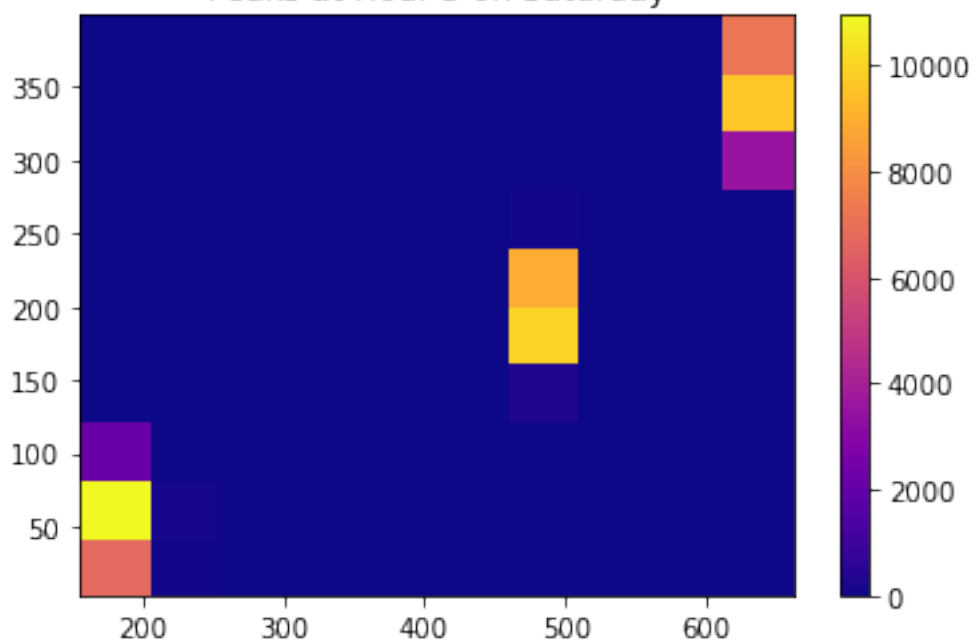
Peaks at Hour 3 on Saturday

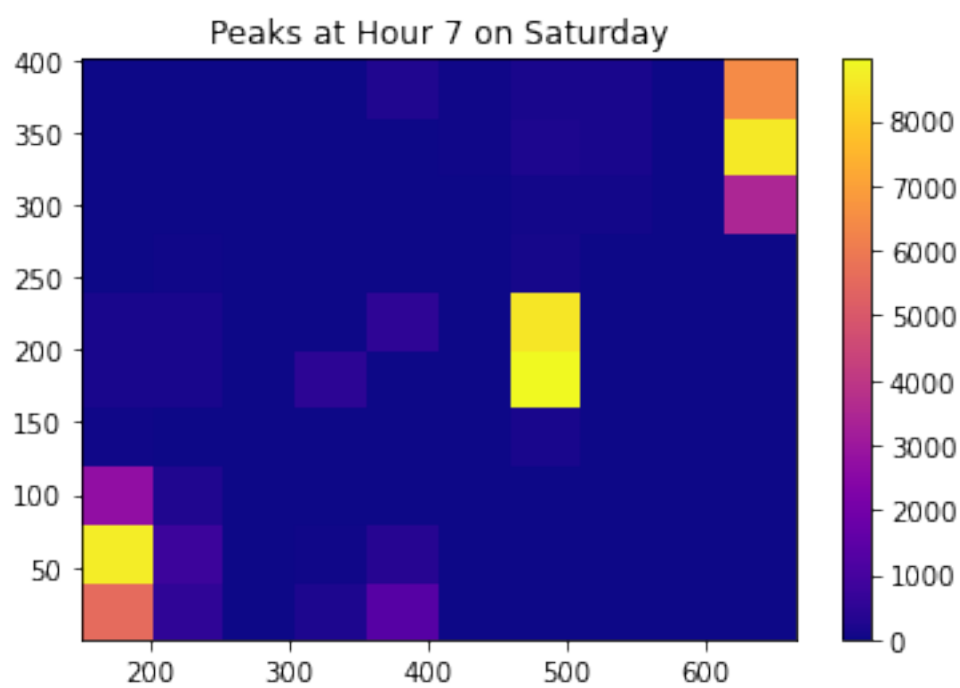
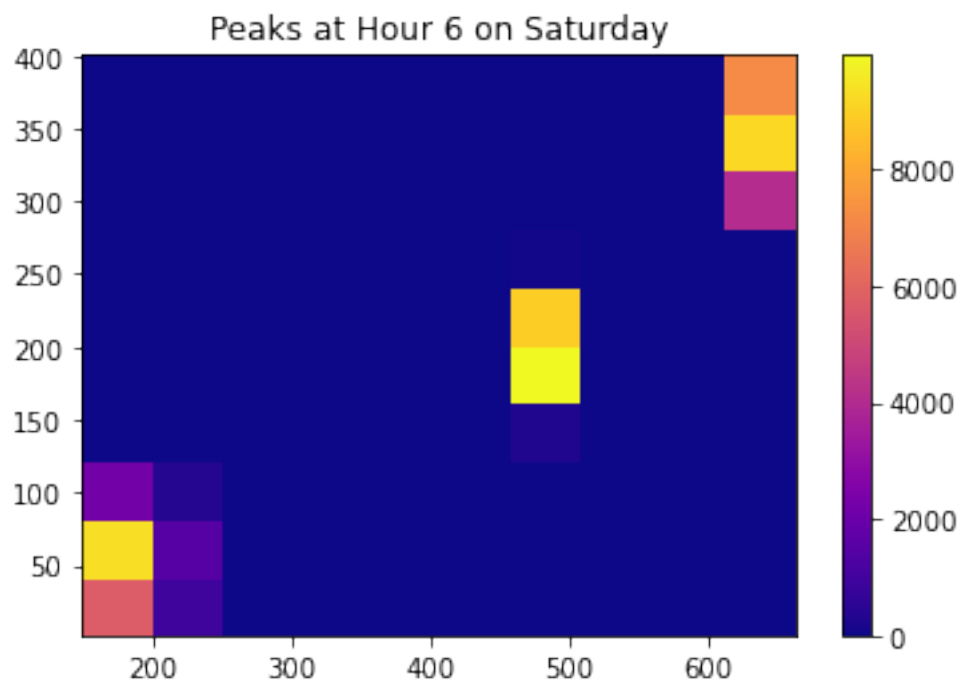


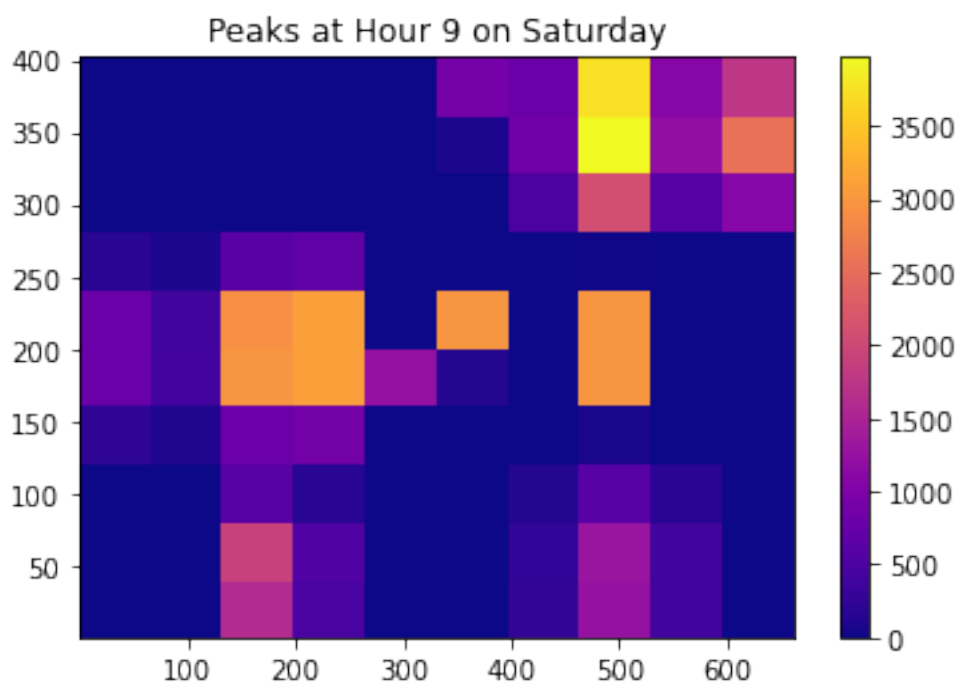
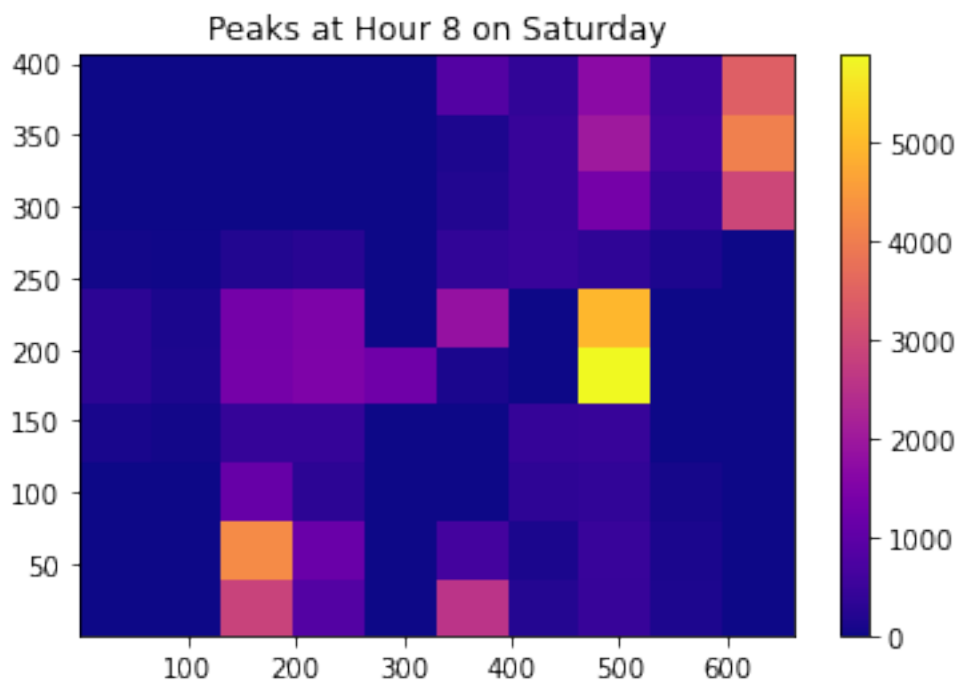
Peaks at Hour 4 on Saturday

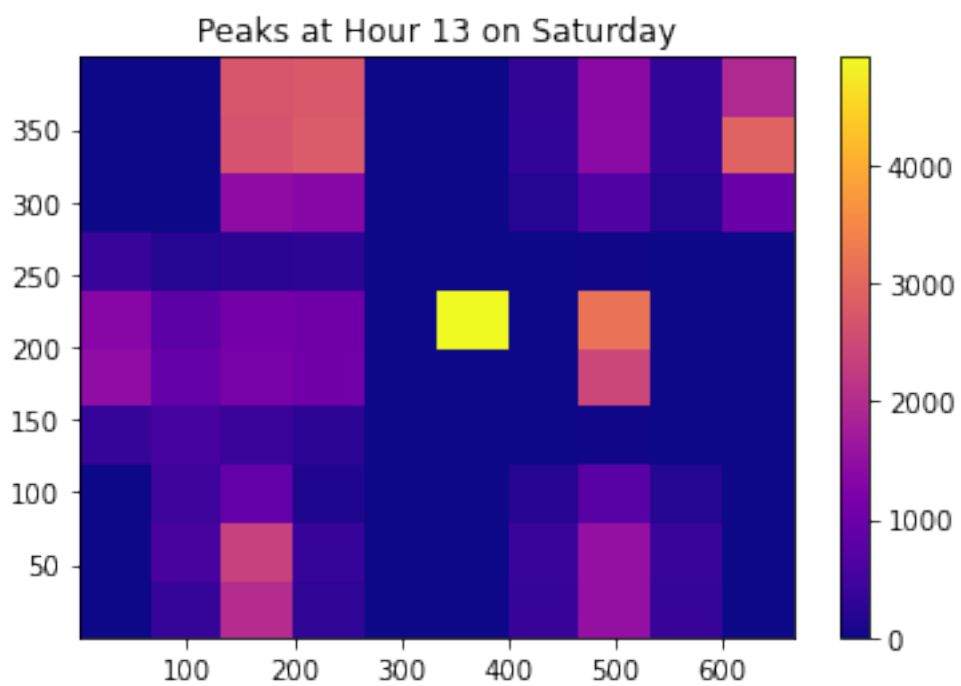
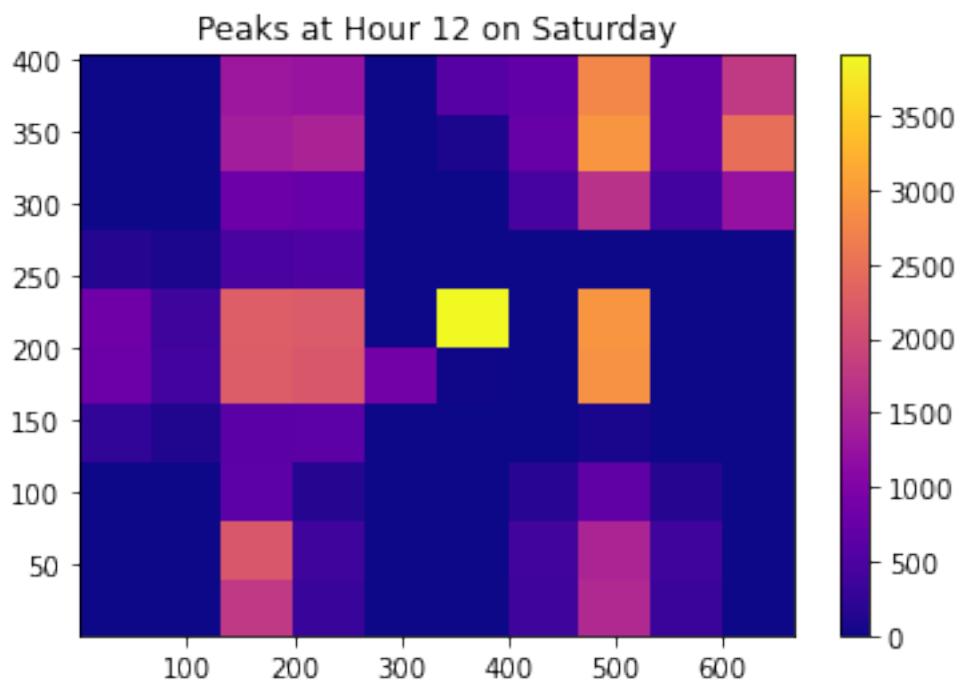


Peaks at Hour 5 on Saturday

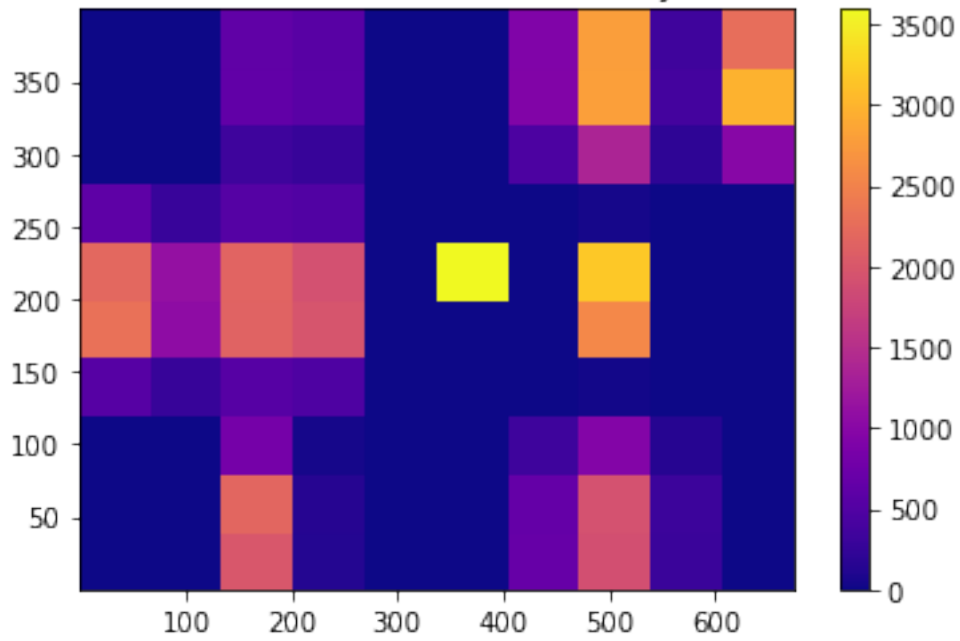




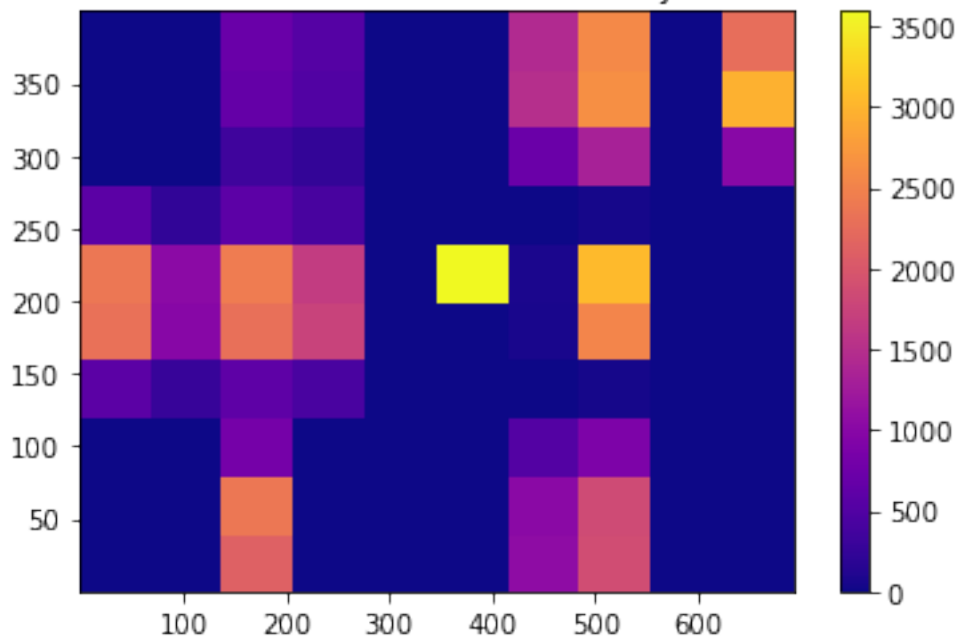




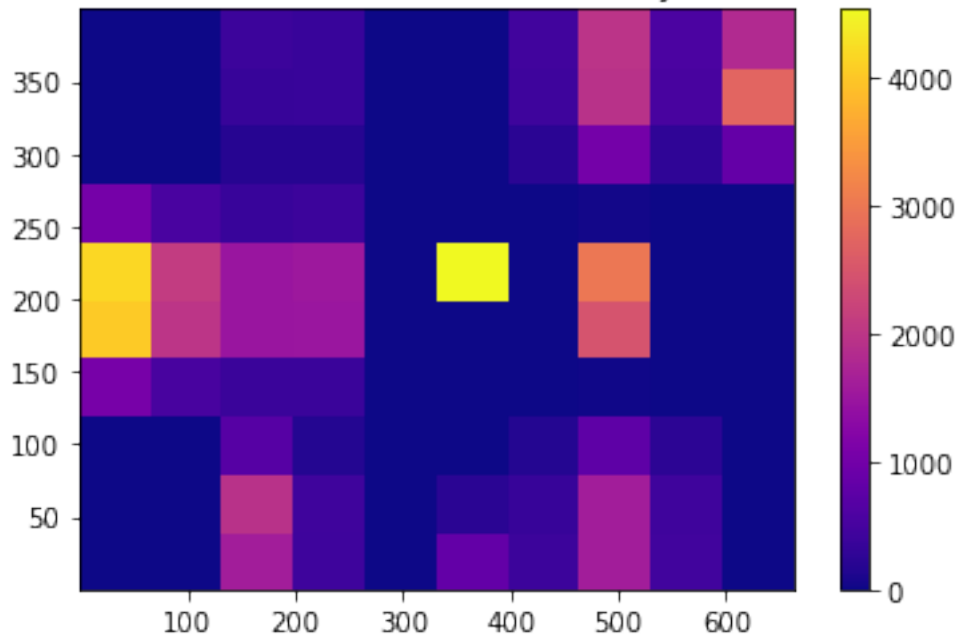
Peaks at Hour 14 on Saturday



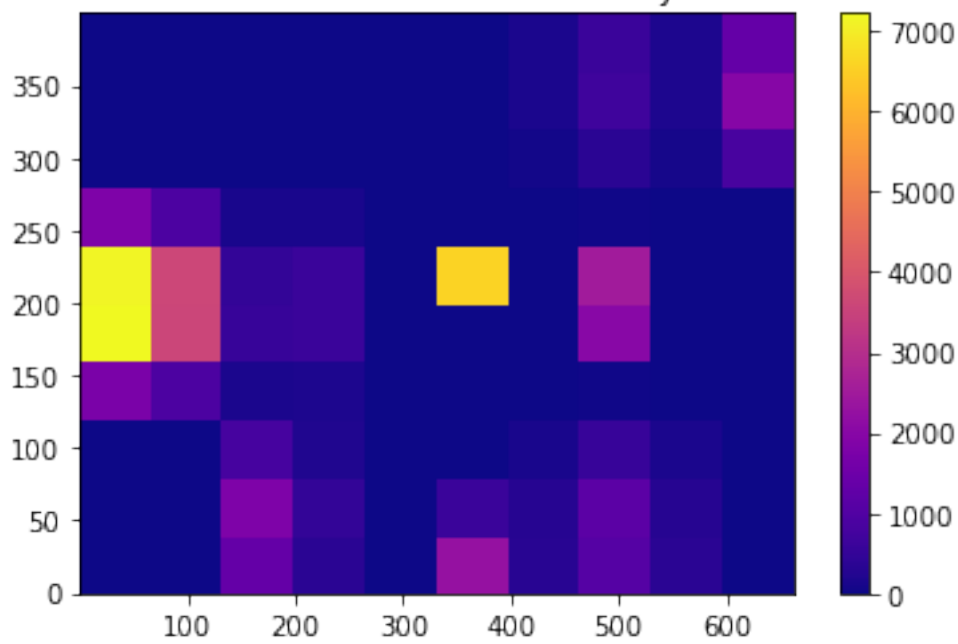
Peaks at Hour 15 on Saturday



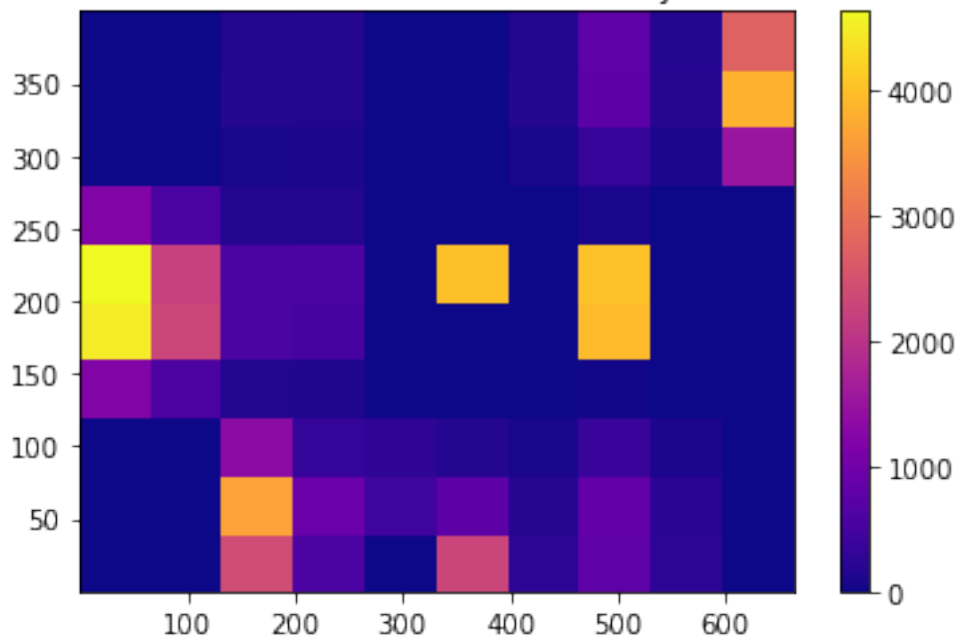
Peaks at Hour 16 on Saturday



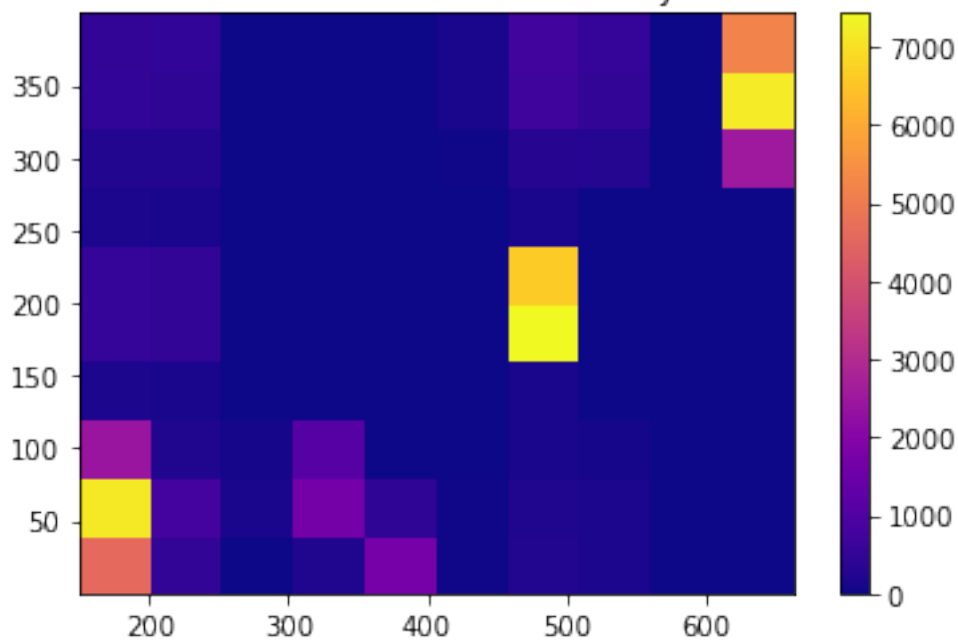
Peaks at Hour 17 on Saturday



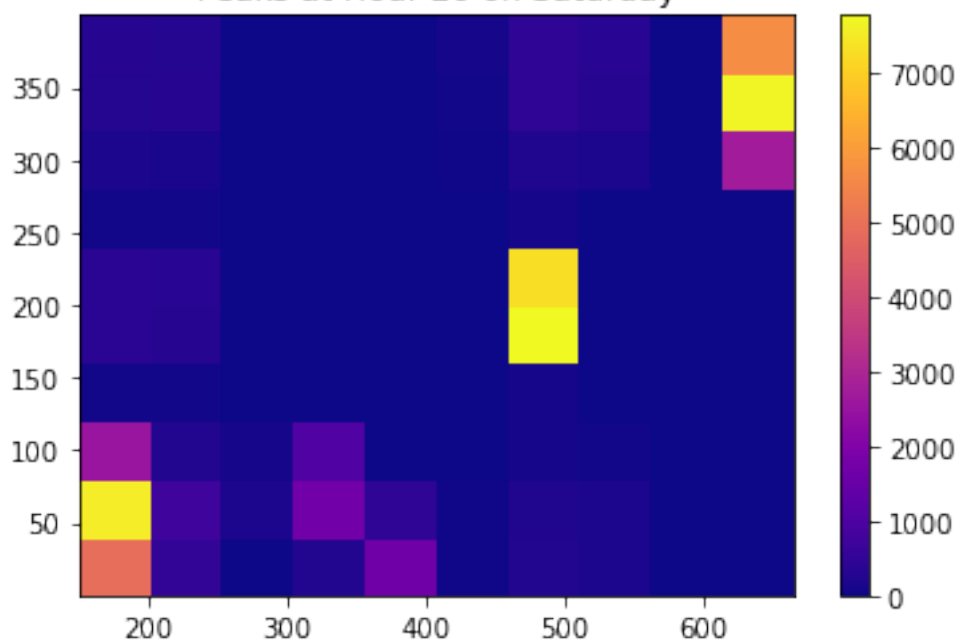
Peaks at Hour 18 on Saturday



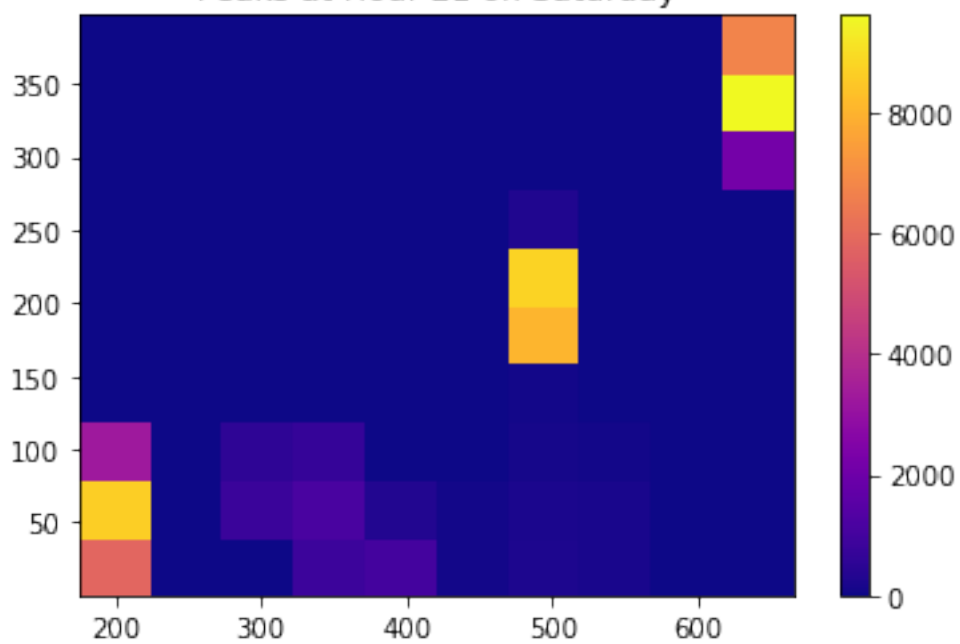
Peaks at Hour 19 on Saturday

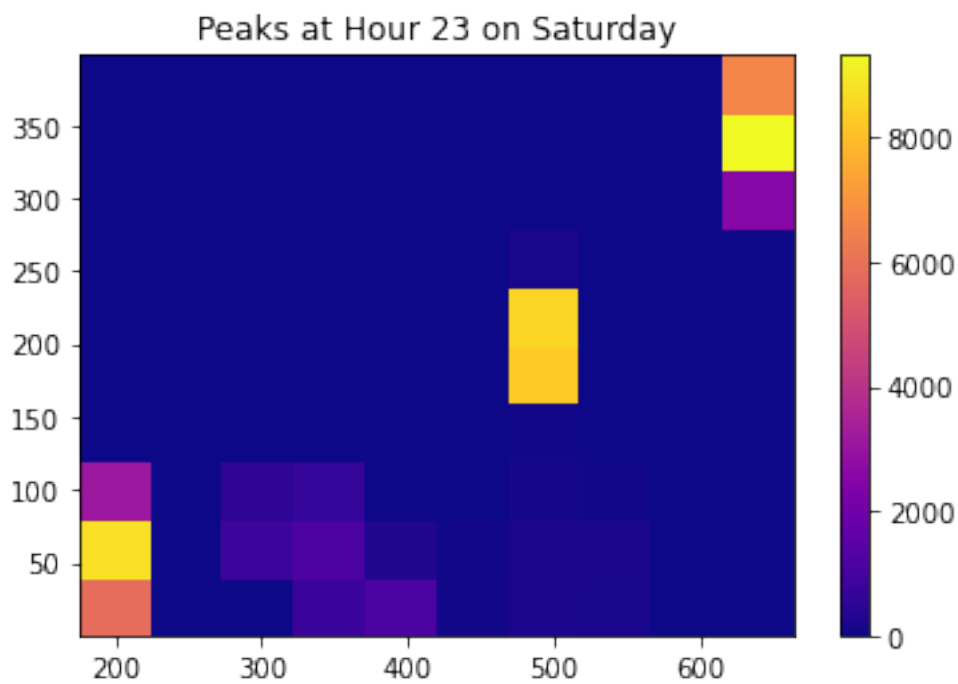
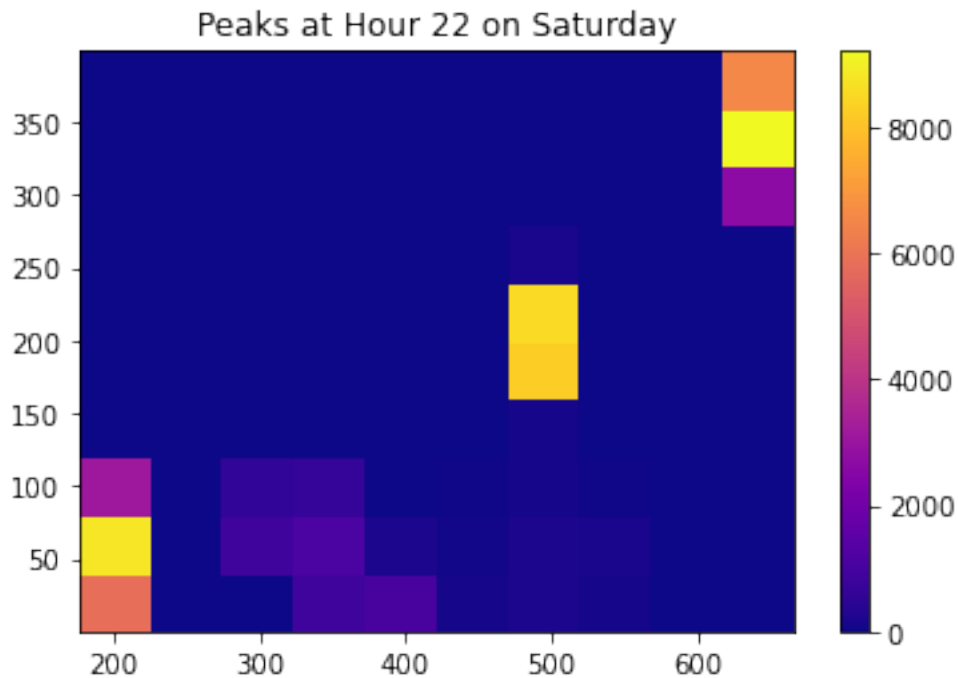


Peaks at Hour 20 on Saturday



Peaks at Hour 21 on Saturday





```
dataSunHourly=[]
for i in range(24):
    dataSunHourly.append(dataSun[dataSun['hour']==i])

rvfreq=[] for i in range(24)
Array_RV_freq=[] for i in range(24)
for i in range(24):
```



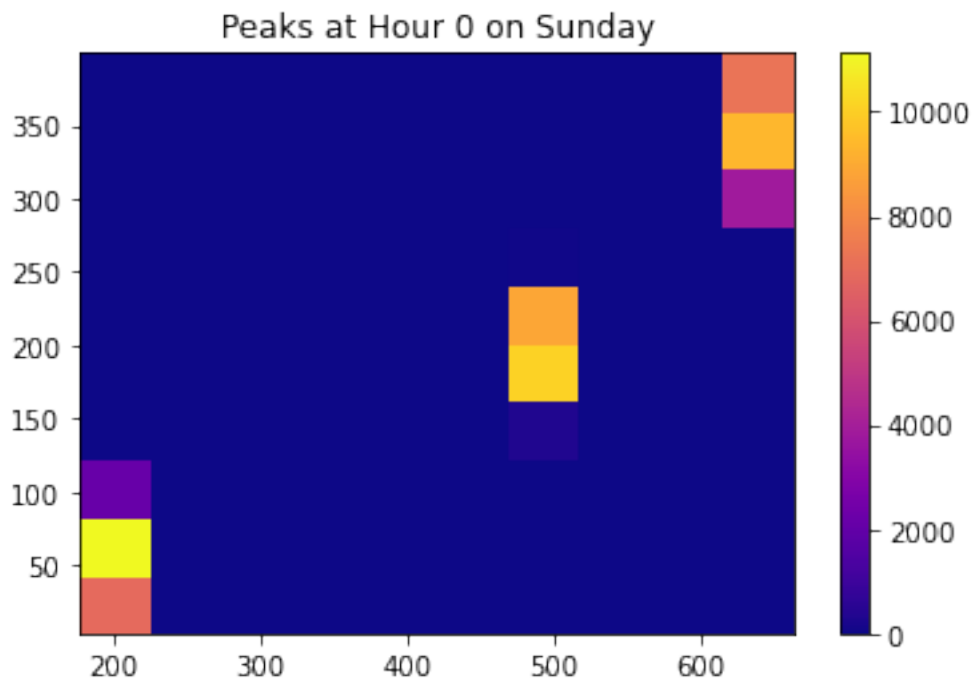
```

rvfreq[i]=np.linspace(min(dataSunHourly[i].X),max(dataSunHourly[i].X),
12)
    for j in range(1,len(rvfreq[i])):
        rv=[]
        rv=dataSunHourly[i][(dataSunHourly[i].X >= rvfreq[i][j-1]) &
(dataSunHourly[i].X <= rvfreq[i][j])]
        Array_RV_freq[i].append(len(rv))

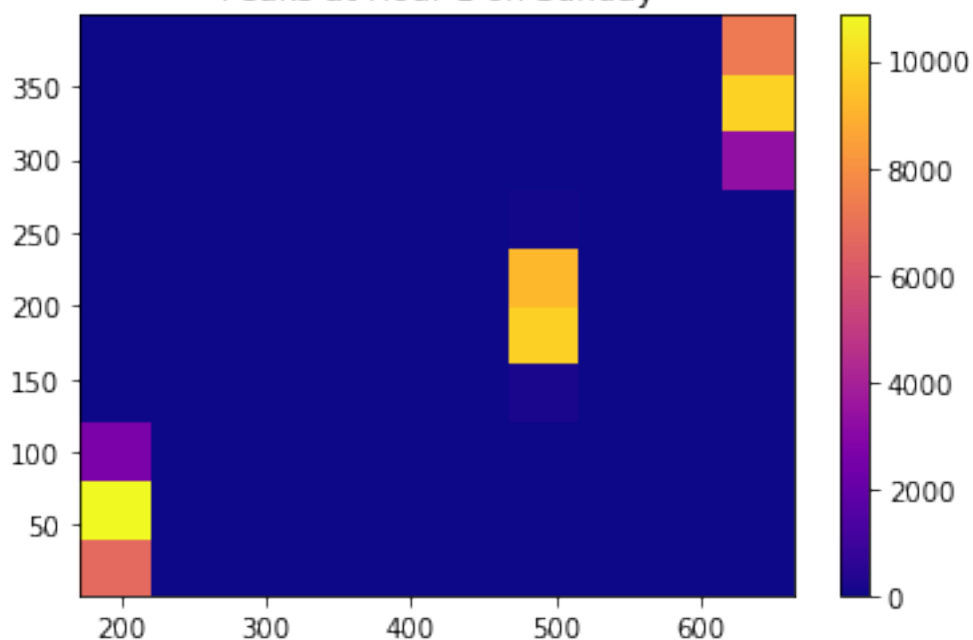
for i in range(24):

plt.hist2d(dataSunHourly[i].X,dataSunHourly[i].Y,cmap=plt.cm.plasma)
plt.title(f'Peaks at Hour {i} on Sunday')
plt.colorbar()
plt.show()

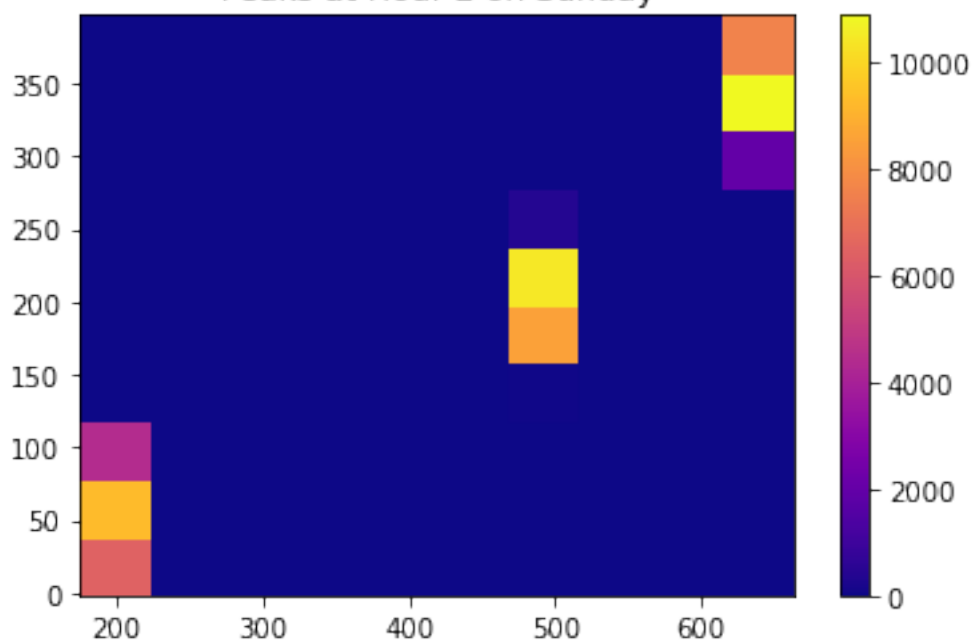
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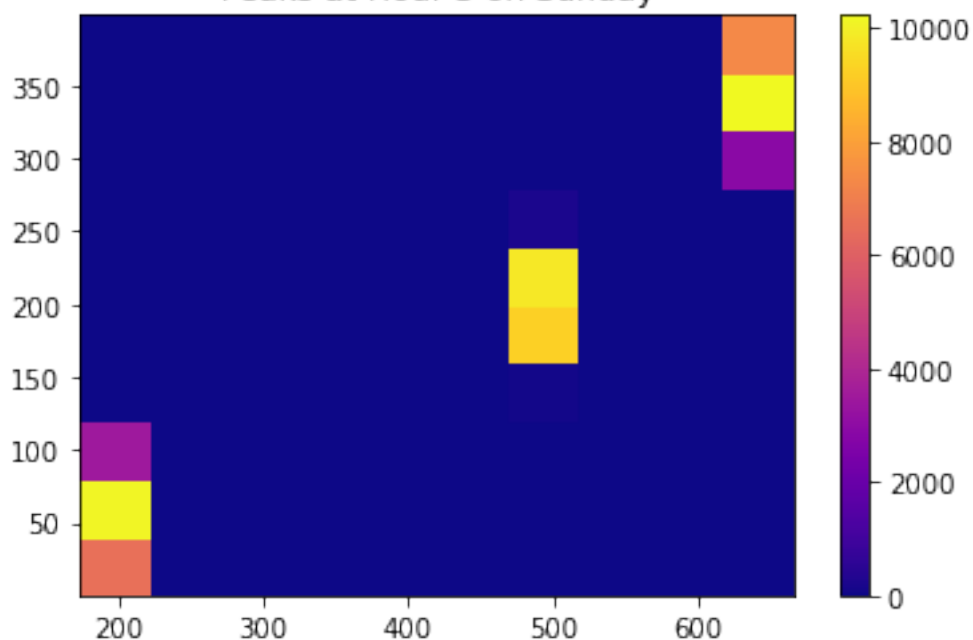
Peaks at Hour 1 on Sunday



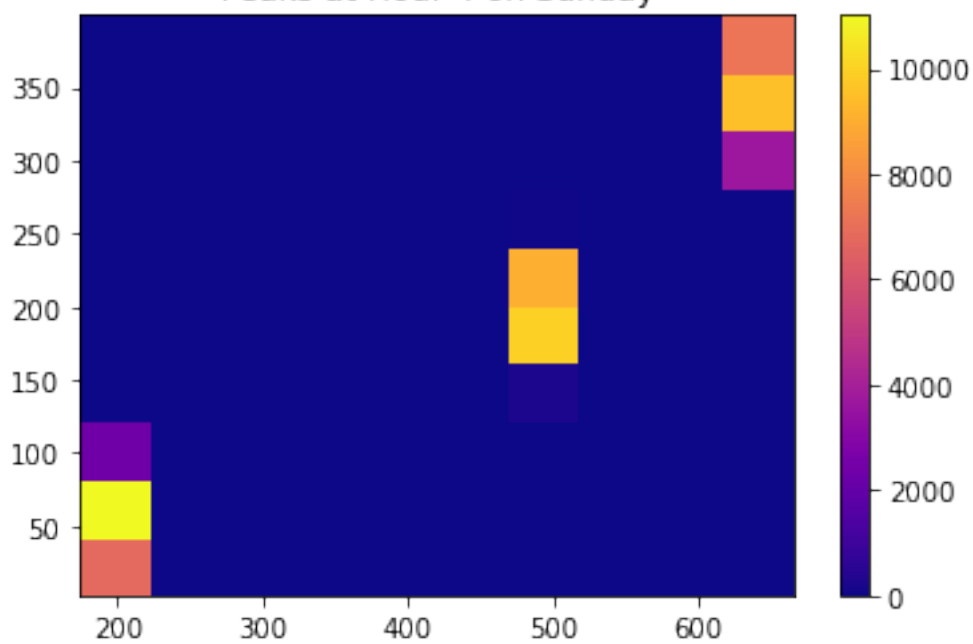
Peaks at Hour 2 on Sunday

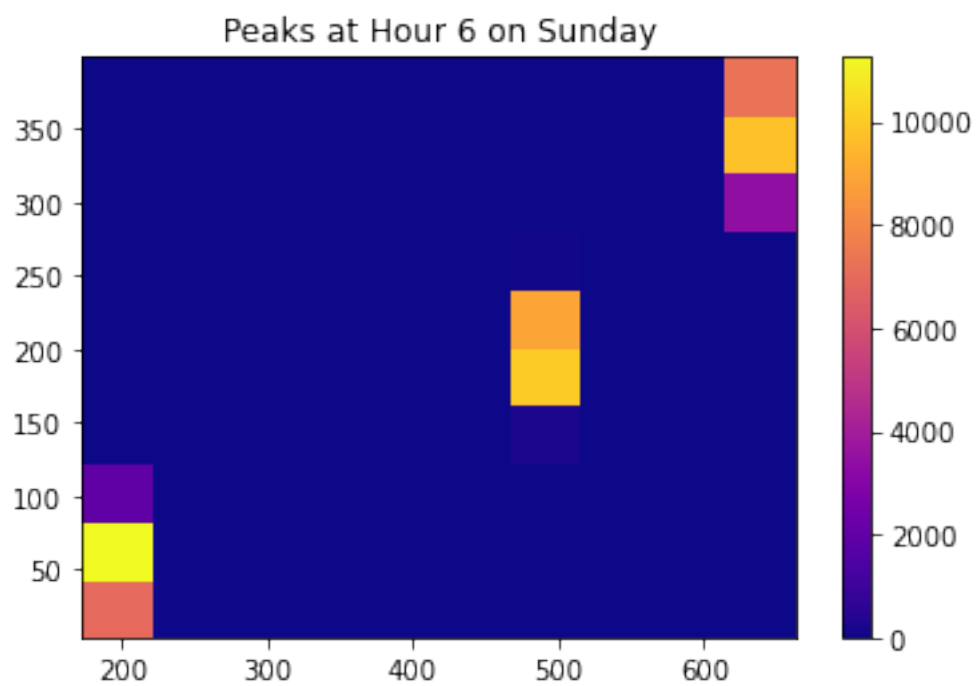
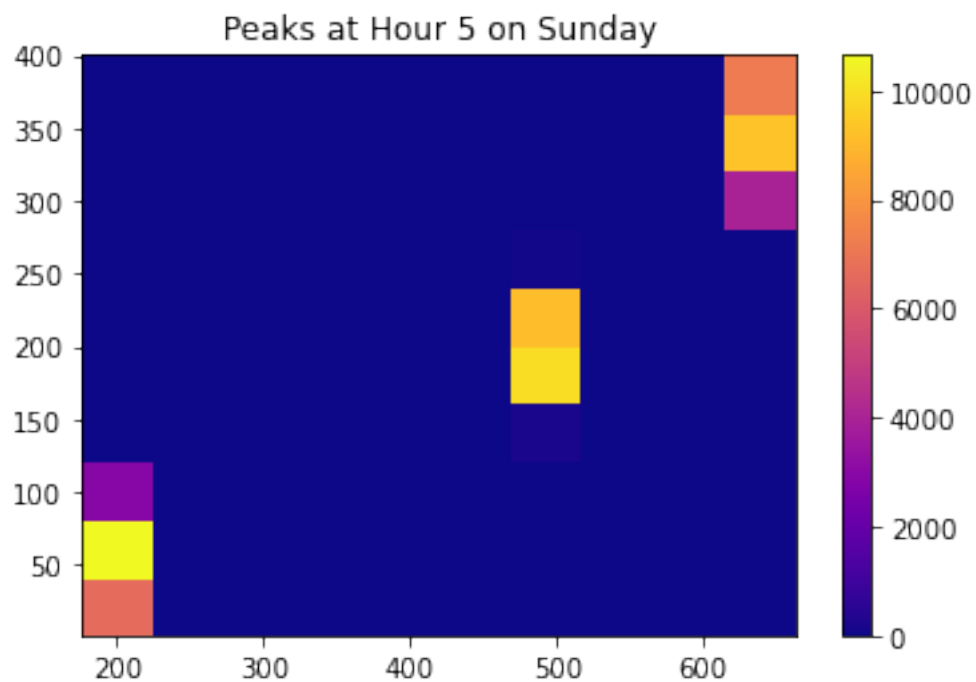


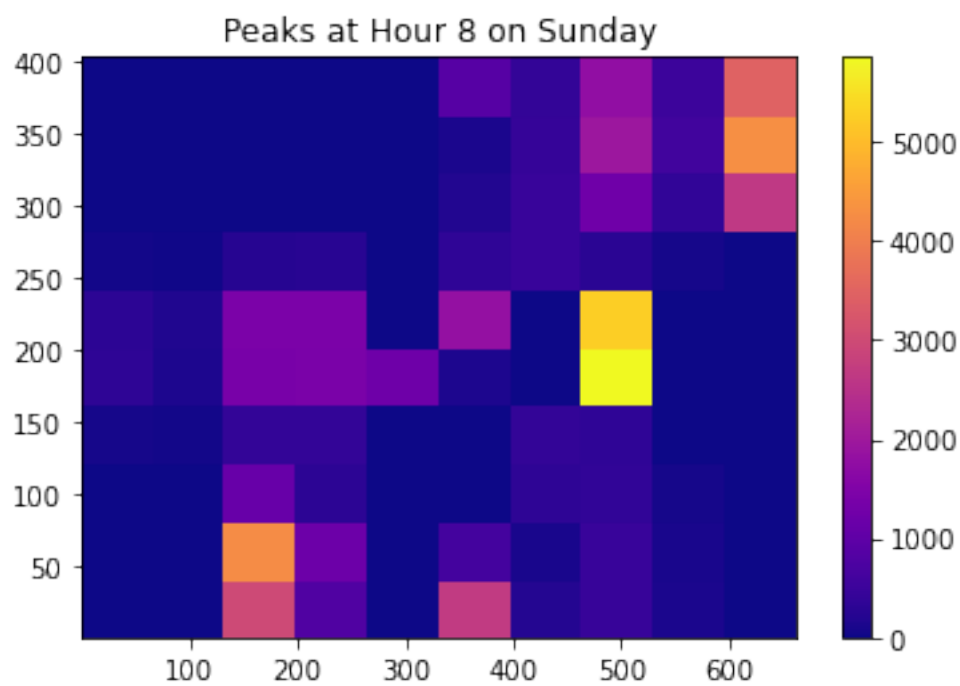
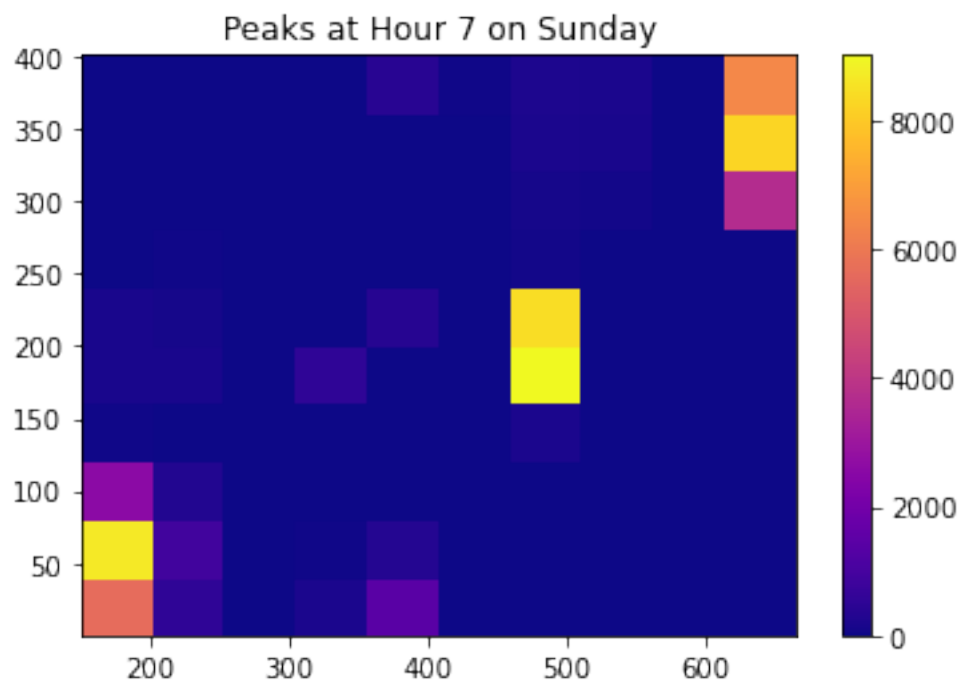
Peaks at Hour 3 on Sunday



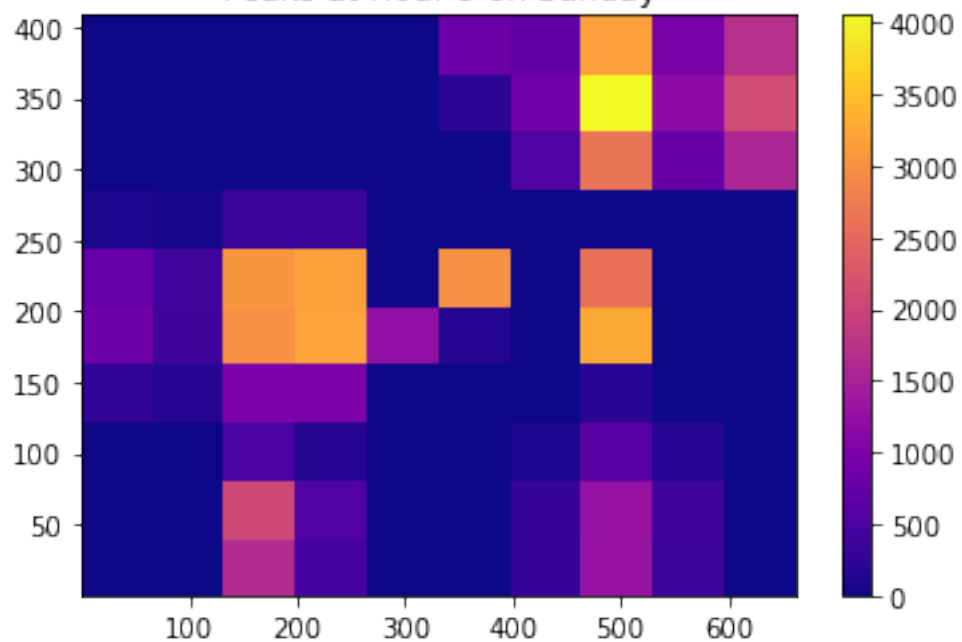
Peaks at Hour 4 on Sunday



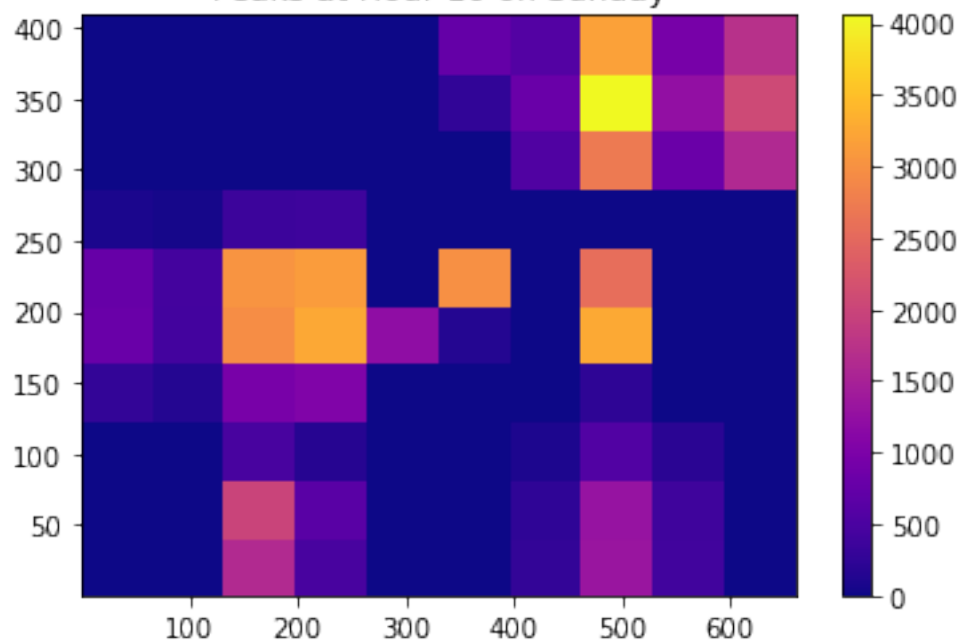


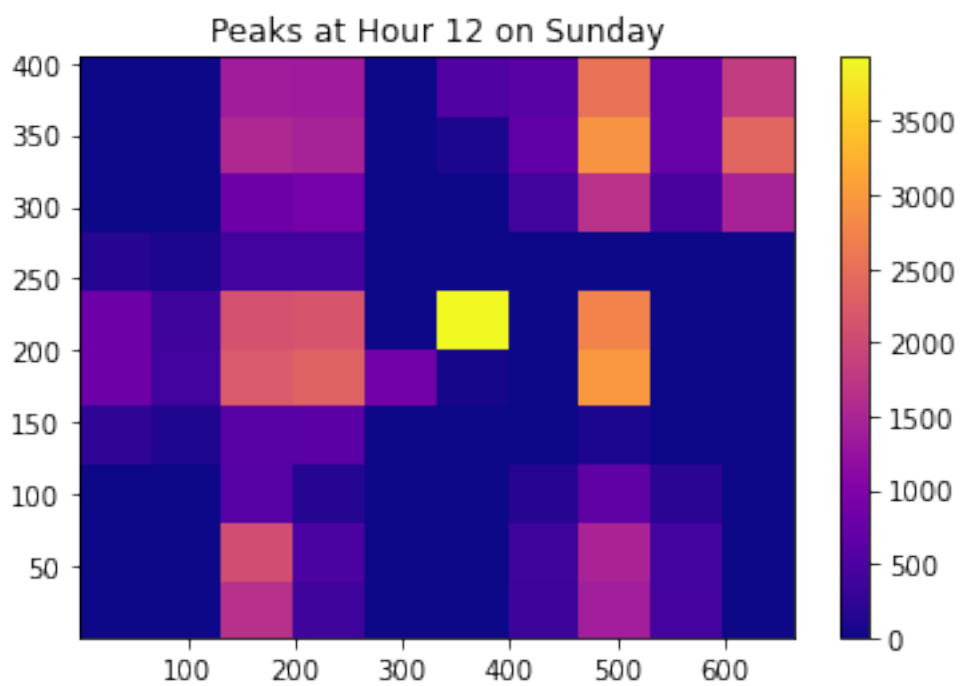
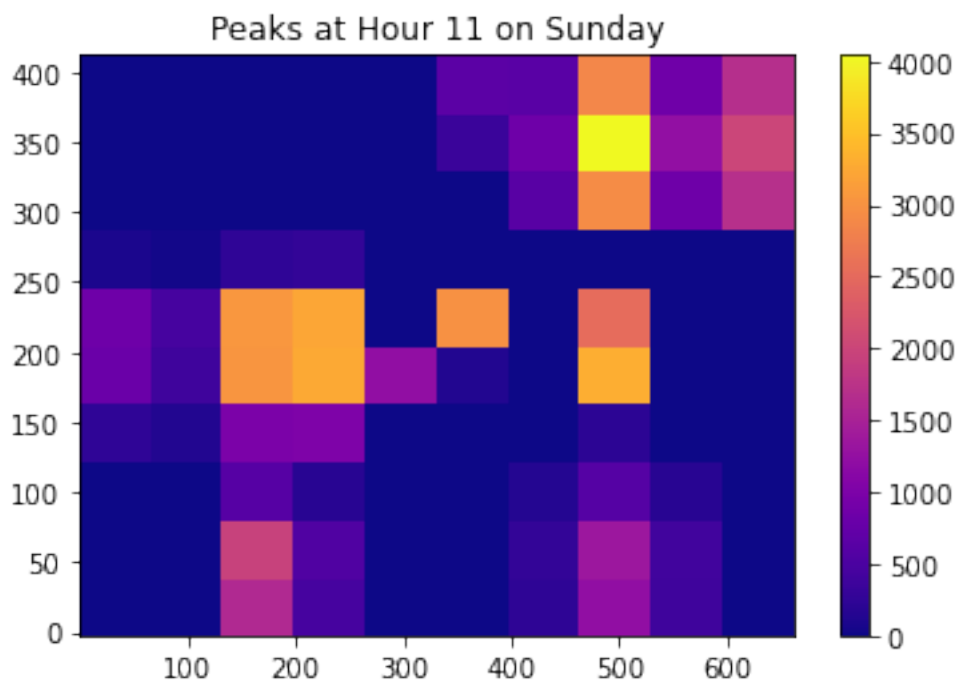


Peaks at Hour 9 on Sunday

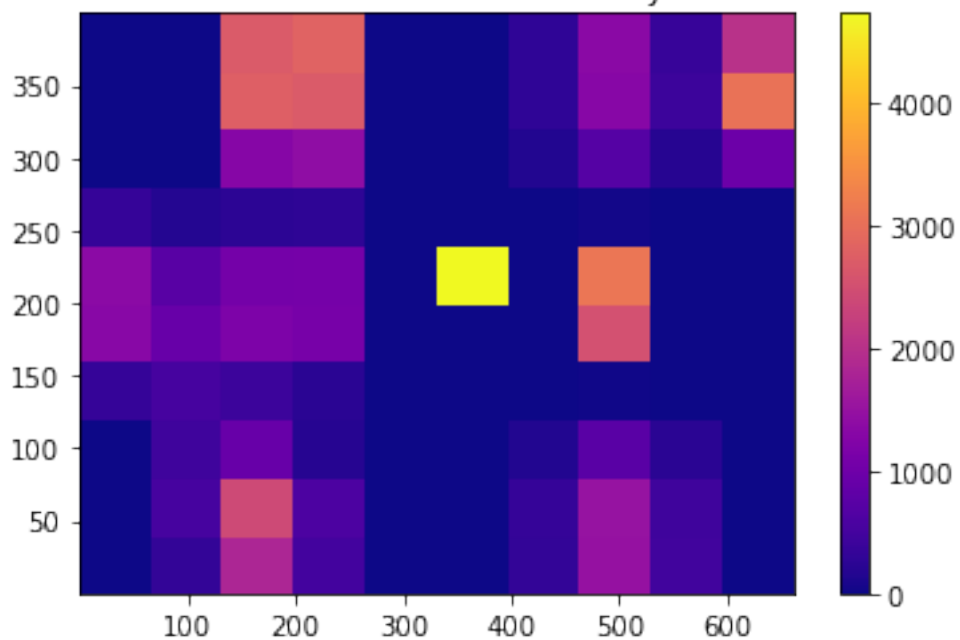


Peaks at Hour 10 on Sunday

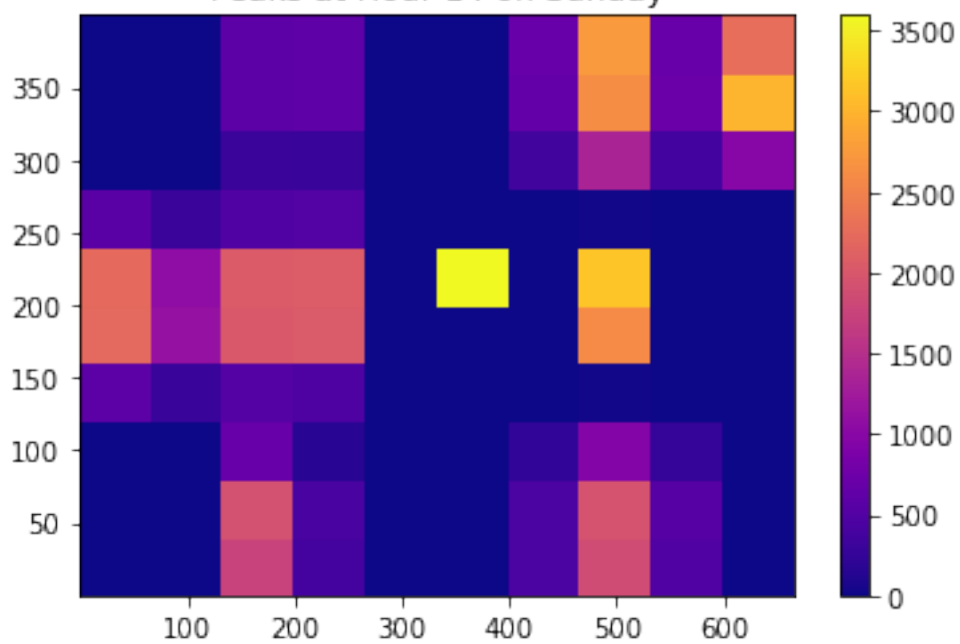




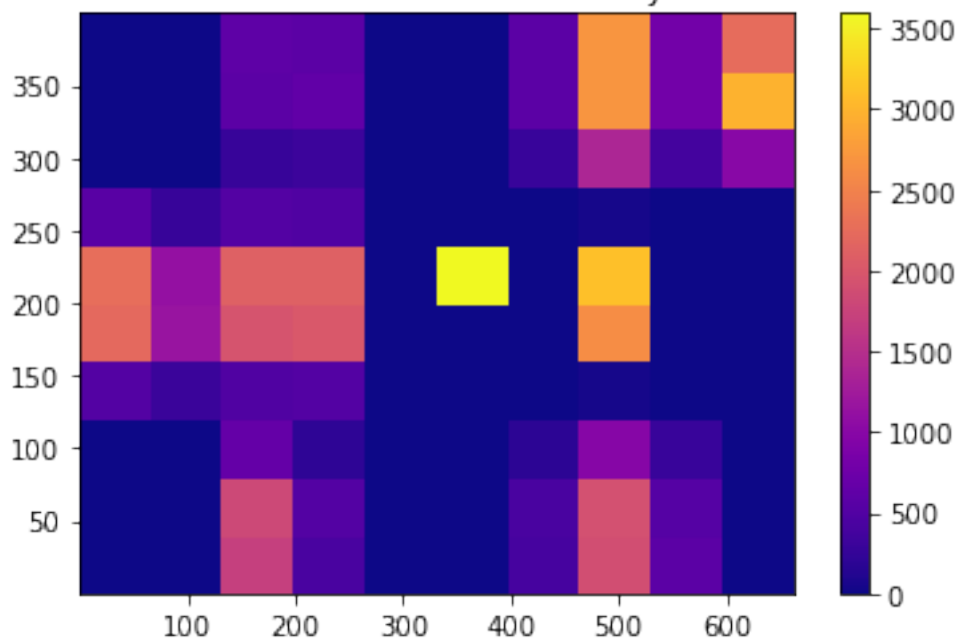
Peaks at Hour 13 on Sunday



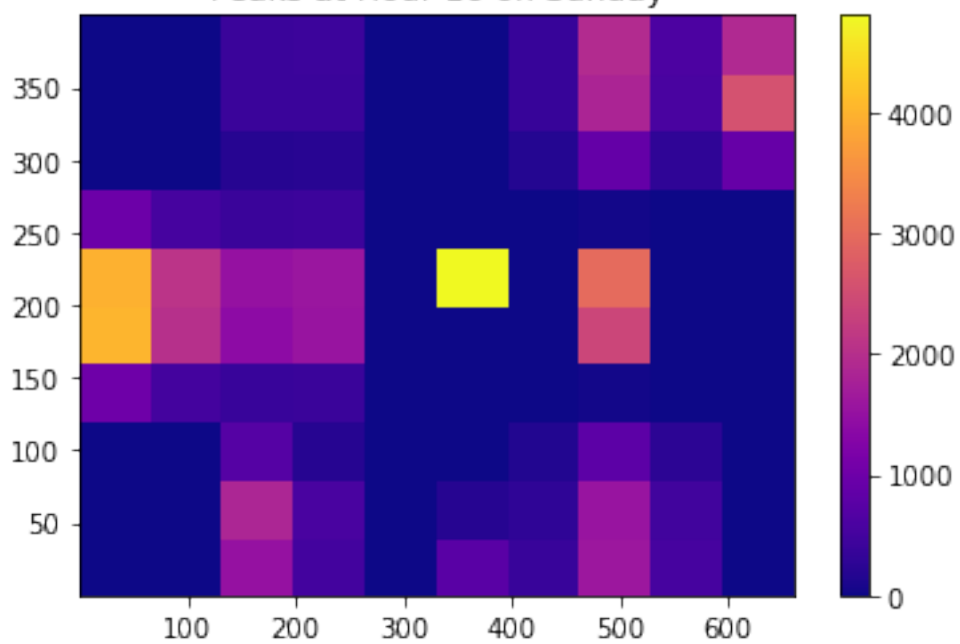
Peaks at Hour 14 on Sunday



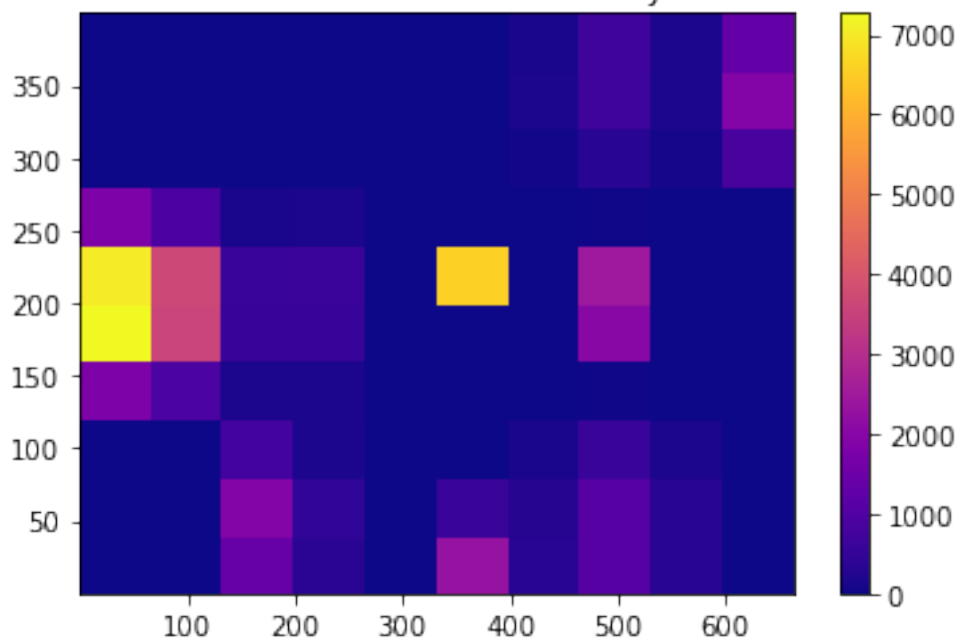
Peaks at Hour 15 on Sunday



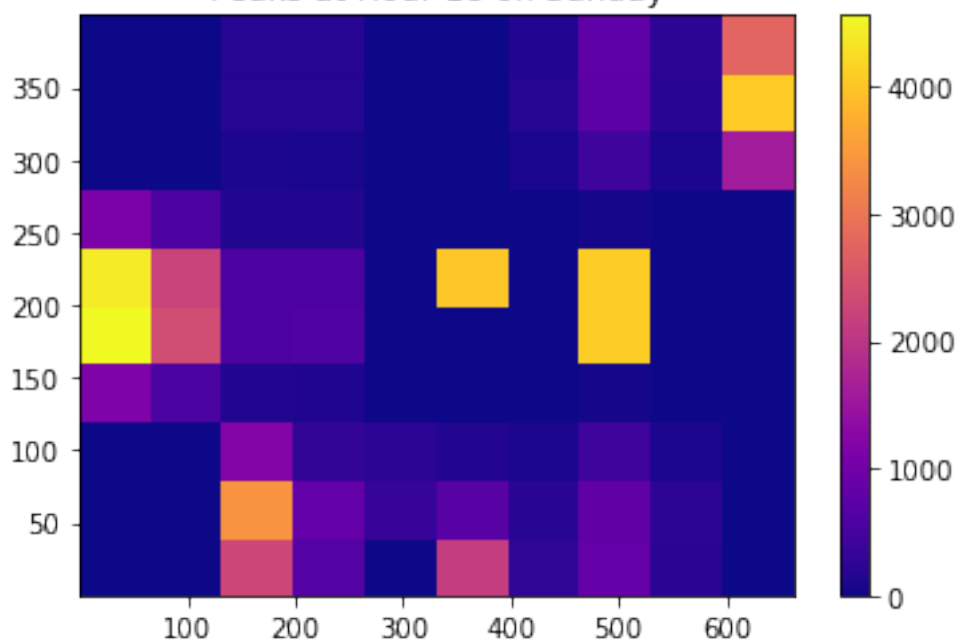
Peaks at Hour 16 on Sunday



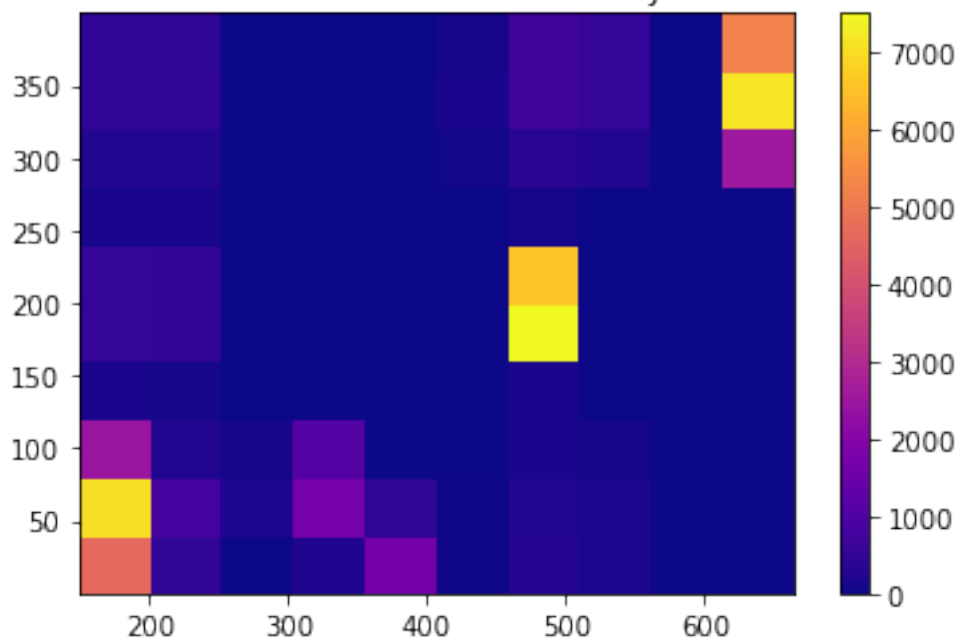
Peaks at Hour 17 on Sunday



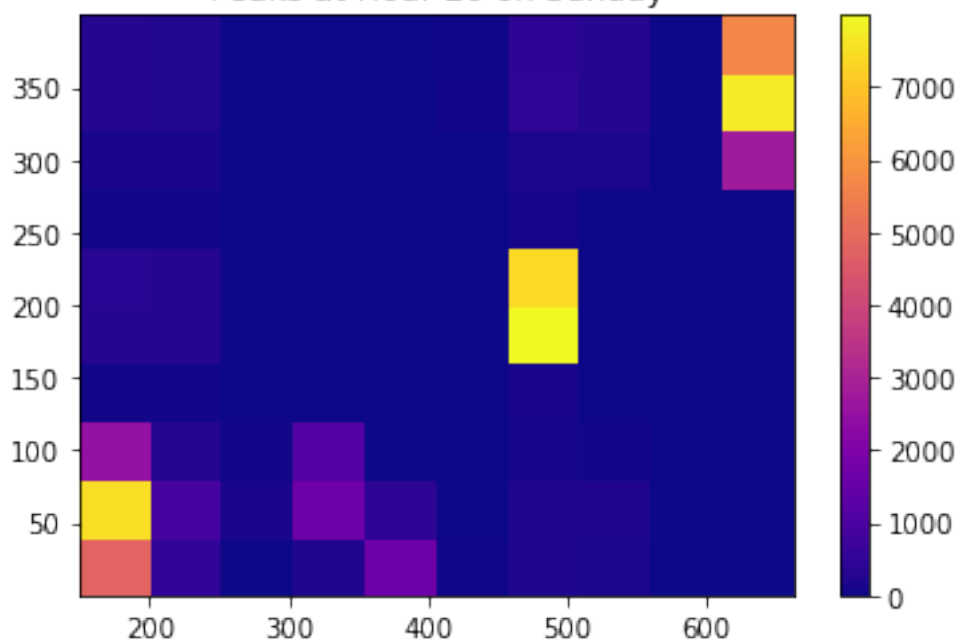
Peaks at Hour 18 on Sunday



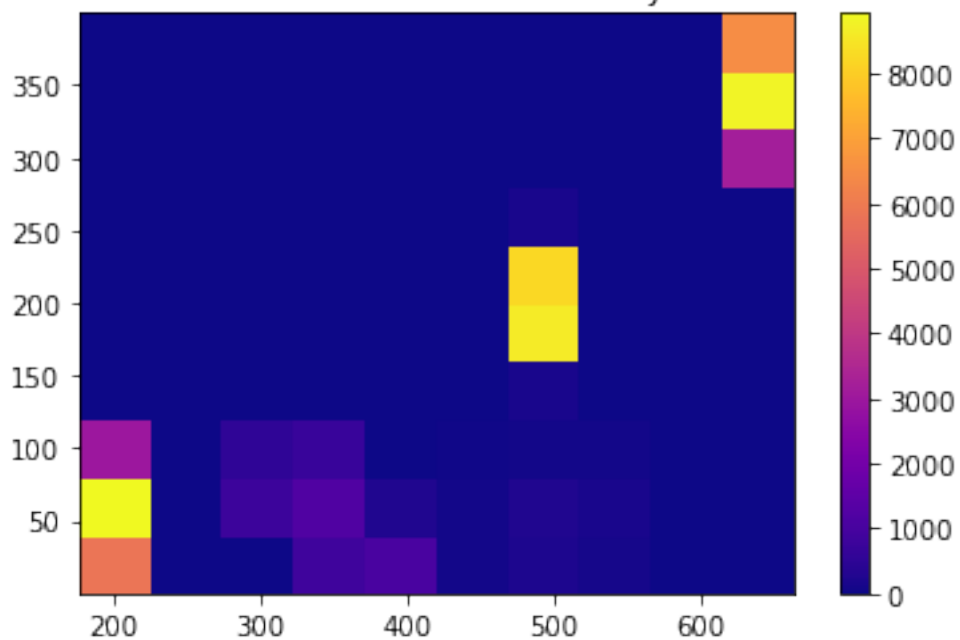
Peaks at Hour 19 on Sunday



Peaks at Hour 20 on Sunday



Peaks at Hour 21 on Sunday



Peaks at Hour 22 on Sunday

