In [99]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt

url='https://raw.githubusercontent.com/vaibhavwalvekar/NYC-Flights-201
FlightsDf=pd.read_csv(url)
print(len(FlightsDf))
FlightsDf.head(5)
```

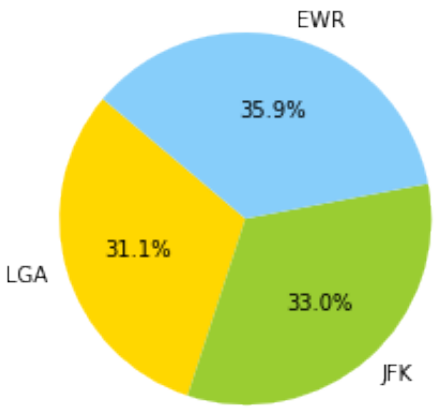
```
336776
```

Out[99]:

	Unnamed: 0	year	month	day	dep_time	dep_delay	arr_time	arr_delay	carrier	tailnum
0	1	2013	1	1	517.0	2.0	830.0	11.0	UA	N14228
1	2	2013	1	1	533.0	4.0	850.0	20.0	UA	N24211
2	3	2013	1	1	542.0	2.0	923.0	33.0	AA	N619AA
3	4	2013	1	1	544.0	-1.0	1004.0	-18.0	B6	N804JB
4	5	2013	1	1	554.0	-6.0	812.0	-25.0	DL	N668DN

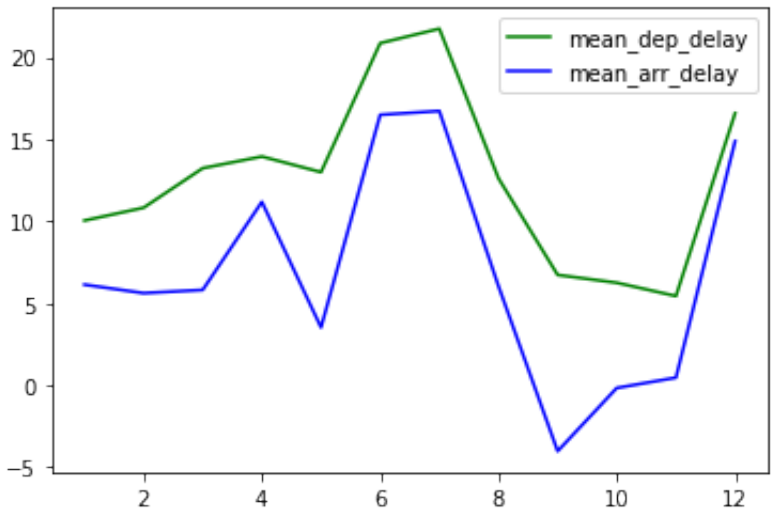
In [3]:
```
#1:proportion of flights from each airport of NYC
amount_flights_from_lga=len(FlightsDf[FlightsDf['origin']=='LGA'])
amount_flights_from_jfk=len(FlightsDf[FlightsDf['origin']=='JFK'])
amount_flights_from_ewr=len(FlightsDf[FlightsDf['origin']=='EWR'])
print(amount_flights_from_lga,amount_flights_from_jfk,amount_flights_f

labels = 'LGA', 'JFK', 'EWR'
sizes=[amount_flights_from_lga,amount_flights_from_jfk,amount_flights_
colors = ['gold', 'yellowgreen',  'lightskyblue']
plt.pie(sizes,  labels=labels, colors=colors, autopct='%1.1f%%', start
plt.show()
```

```
104662 111279 120835
```



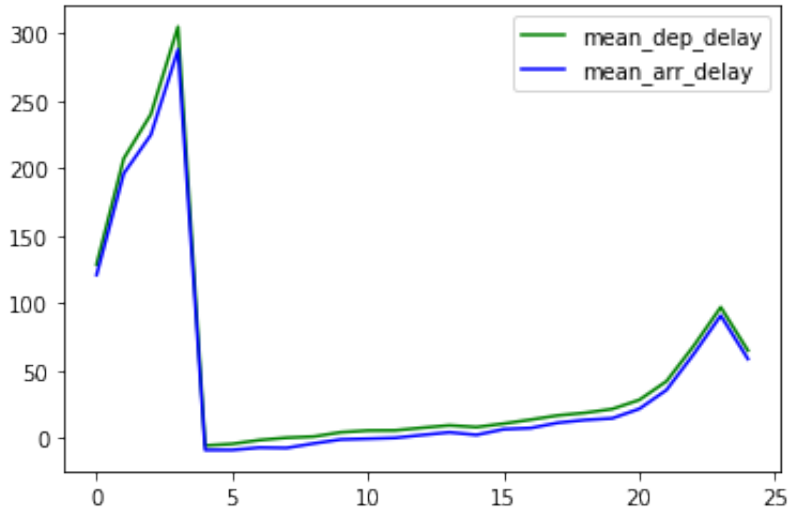
In [4]:
```
#2:a plot of delays depending from month
mean_dep_delay_by_month=FlightsDf.groupby('month')['dep_delay'].mean()
mean_arr_delay_by_month=FlightsDf.groupby('month')['arr_delay'].mean()

plt.plot(mean_dep_delay_by_month['month'],mean_dep_delay_by_month['mea
plt.plot(mean_arr_delay_by_month['month'],mean_arr_delay_by_month['mea
plt.legend()

#We see that in the middle of summer delays are big and at the beginni
```

Out[4]: <matplotlib.legend.Legend at 0x1212a12e8>

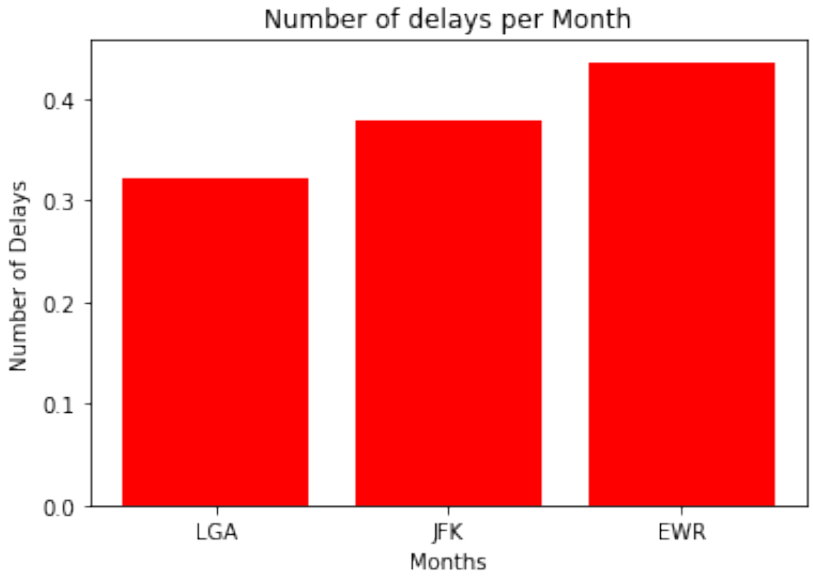


In [5]:
```
#3: a plot of delays depending from hour
mean_dep_delay_by_hour=FlightsDf.groupby('hour')['dep_delay'].mean().r
mean_arr_delay_by_hour=FlightsDf.groupby('hour')['arr_delay'].mean().r

plt.plot(mean_dep_delay_by_hour['hour'],mean_dep_delay_by_hour['mean_d
plt.plot(mean_arr_delay_by_hour['hour'],mean_arr_delay_by_hour['mean_a
plt.legend()
#we see that delays are most frequent early at the morning
```

Out[5]: <matplotlib.legend.Legend at 0x1212be128>



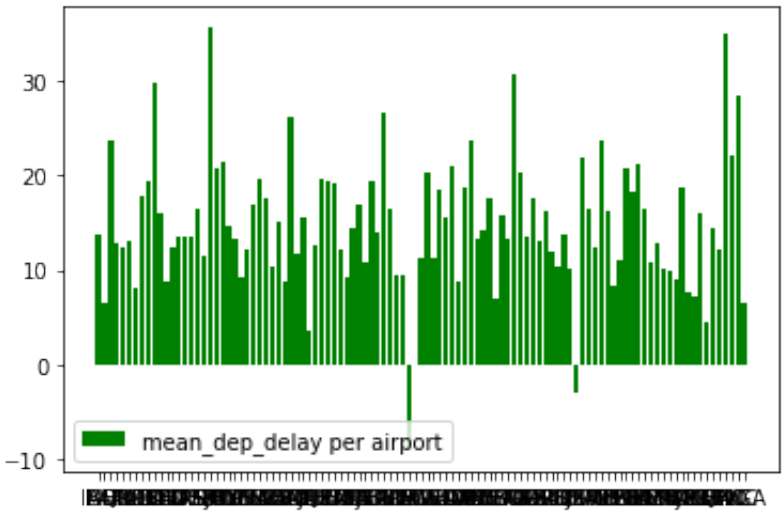
In [51]:
```
#4: percentage of delayed flights in three airports of NYC
flights_from_lga=FlightsDf[FlightsDf['origin']=='LGA']
amount_flights_from_lga=len(flights_from_lga)
delayed_flights_from_lga=flights_from_lga[flights_from_lga['dep_delay'
amount_delayed_flights_from_lga=len(delayed_flights_from_lga)

flights_from_jfk=FlightsDf[FlightsDf['origin']=='JFK']
amount_flights_from_jfk=len(flights_from_jfk)
delayed_flights_from_jfk=flights_from_jfk[flights_from_jfk['dep_delay'
amount_delayed_flights_from_jfk=len(delayed_flights_from_jfk)

flights_from_ewr=FlightsDf[FlightsDf['origin']=='EWR']
amount_flights_from_ewr=len(flights_from_ewr)
delayed_flights_from_ewr=flights_from_ewr[flights_from_ewr['dep_delay'
amount_delayed_flights_from_ewr=len(delayed_flights_from_ewr)

#print(amount_flights_from_lga,amount_delayed_flights_from_lga)
#print(amount_flights_from_jfk,amount_delayed_flights_from_jfk)
#print(amount_flights_from_ewr,amount_delayed_flights_from_ewr)

airports=['LGA','JFK','EWR']
percentage_of_delayed=[amount_delayed_flights_from_lga/amount_flights_
                       amount_delayed_flights_from_jfk/amount_flights_
                       amount_delayed_flights_from_ewr/amount_flights_

plt.bar(airports, percentage_of_delayed, color="red")
plt.ylabel('Number of Delays')
plt.xlabel('Months')
plt.title('Number of delays per Month')
plt.show()

#we see that the least percentage of delays has LGA
```



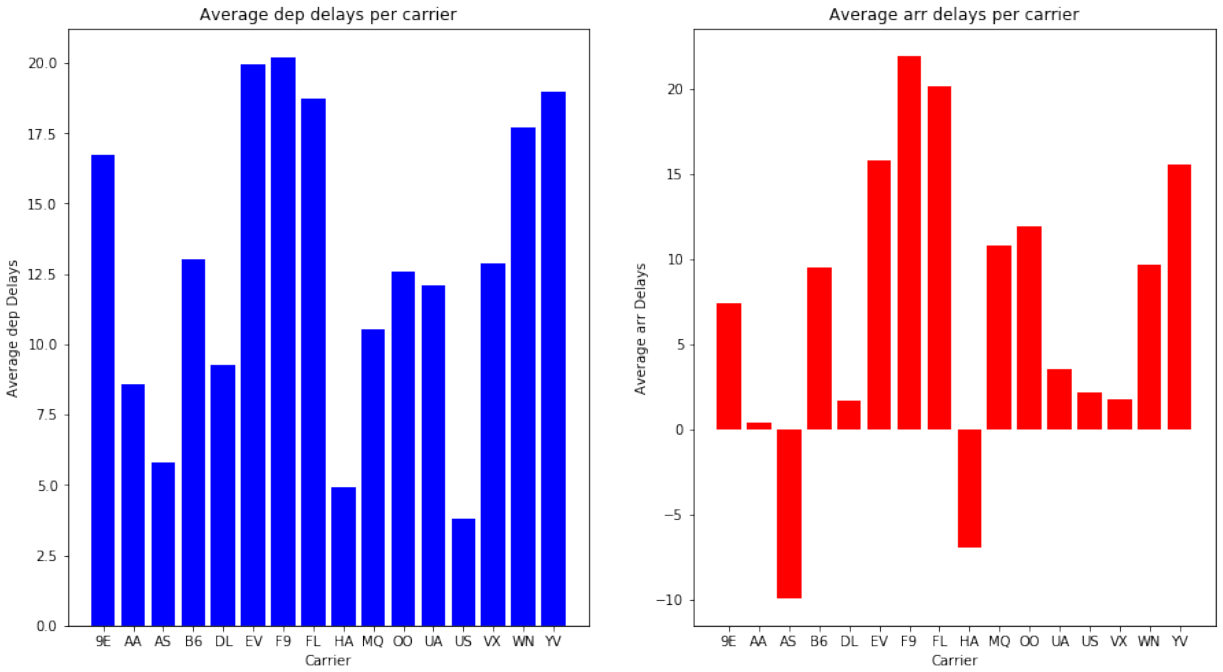
In [42]:
```
#5: mean delay per airports
unique_airports=FlightsDf['dest'].unique()
mean_dep_delay=FlightsDf.groupby('dest')['dep_delay'].mean().reset_inc

grouped=FlightsDf.groupby('dest')['dep_delay'].mean().reset_index(name
print(FlightsDf.groupby('dest')['dep_delay'].mean().min())
print(grouped[grouped['mean_dep_delay']==-9])
print(grouped[grouped['dest']=='LEX'])
plt.bar(unique_airports,mean_dep_delay['mean_dep_delay'],color='g',lab
plt.legend()
#we see that there is one airport LEX with min delay and two with appr
```

```
-9.0
   dest  mean_dep_delay
50  LEX            -9.0
   dest  mean_dep_delay
50  LEX            -9.0
```

Out[42]: <matplotlib.legend.Legend at 0x123f166d8>



In [55]:
```
#6: perecent delays per carrier
mean_dep_delay_per_carrier=FlightsDf.groupby('carrier')['dep_delay'].m
#print(mean_dep_delay_per_carrier)
mean_arr_delay_per_carrier=FlightsDf.groupby('carrier')['arr_delay'].m

carrier=mean_dep_delay_per_carrier['carrier']
dep_delay=mean_dep_delay_per_carrier['mean_dep_delay']
arr_delay=mean_arr_delay_per_carrier['mean_arr_delay']

plt.figure(figsize=(15,8))

plt.subplot(1,2,1)
plt.bar(carrier, dep_delay, color="blue")
plt.ylabel('Average dep Delays')
plt.xlabel('Carrier')
plt.title('Average dep delays per carrier')

plt.subplot(1,2,2)
plt.bar(carrier, arr_delay, color="red")
plt.ylabel('Average arr Delays')
plt.xlabel('Carrier')
plt.title('Average arr delays per carrier')
plt.show()
```



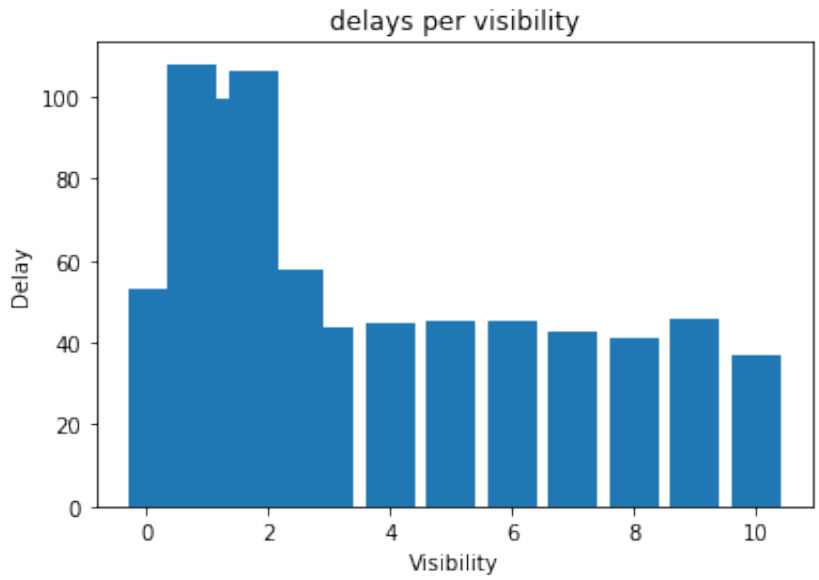
In [77]:
```
#glue the weather to the flights
url2='https://raw.githubusercontent.com/vaibhavwalvekar/NYC-Flights-2(

WeatherDf=pd.read_csv(url2)
#print(len(WeatherDf))
WeatherDf.head(5)

flights_delayed = FlightsDf[FlightsDf['dep_delay']>0]
groupby_output = \
flights_delayed.groupby([flights_delayed['origin'],flights_delayed['mo
grouped_origin_time_hour = groupby_output['dep_delay'].agg([np.size, r
grouped_origin_time_hour.head()

flights_with_weather = pd.merge(grouped_origin_time_hour, WeatherDf, o
flights_with_weather = flights_with_weather.rename(columns={'size': 'C
flights_with_weather.head()
```

Out[77]:

	origin	month	day	hour	Count	TotalDelay	Unnamed: 0	year	temp	dewp	humid	wind_
0	EWR	1	1	6.0	5.0	8.400000	6	2013	39.02	26.06	59.37	27
1	EWR	1	1	7.0	4.0	22.250000	7	2013	39.02	26.96	61.63	25
2	EWR	1	1	8.0	6.0	5.500000	8	2013	39.02	28.04	64.43	24
3	EWR	1	1	9.0	7.0	35.428571	9	2013	39.92	28.04	62.21	25
4	EWR	1	1	10.0	7.0	10.428571	10	2013	39.02	28.04	64.43	26

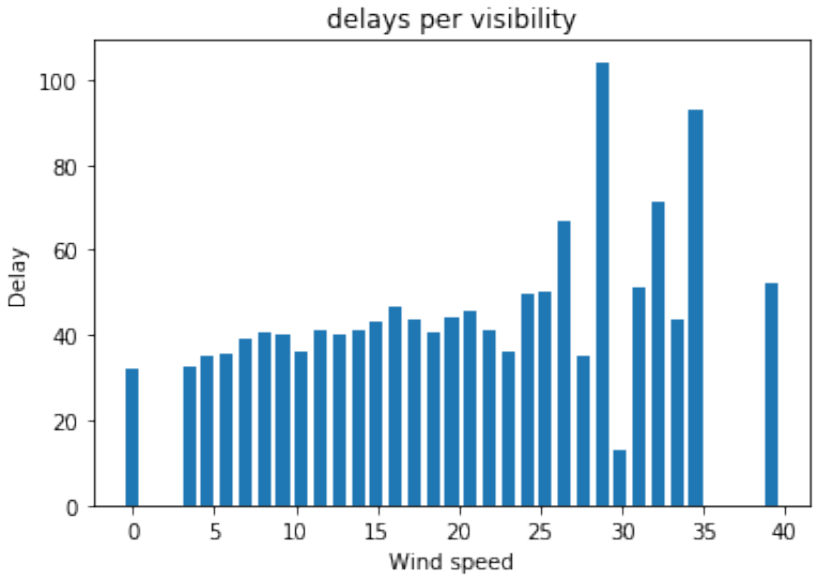
In [78]:
```
#7:plot of visibility against delays
by_visib=flights_with_weather.groupby('visib')['TotalDelay'].mean().re
by_visib
plt.bar(by_visib['visib'],by_visib['delay'])
plt.ylabel('Delay')
plt.xlabel('Visibility')
plt.title('delays per visibility')
```

Out[78]:
```
Text(0.5, 1.0, 'delays per visibility')
```



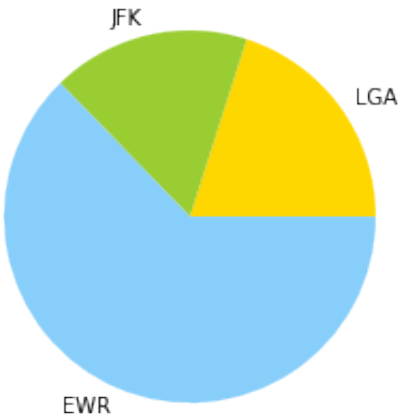
In [91]:
```
#8:plot of wind speed against delays
by_wind_speed=flights_with_weather.groupby('wind_speed')['TotalDelay']
by_wind_speed=by_wind_speed[0:30]
plt.bar(by_wind_speed['wind_speed'],by_wind_speed['delay'])
plt.ylabel('Delay')
plt.xlabel('Wind speed')
plt.title('delays per visibility')
```

Out[91]:
```
Text(0.5, 1.0, 'delays per visibility')
```



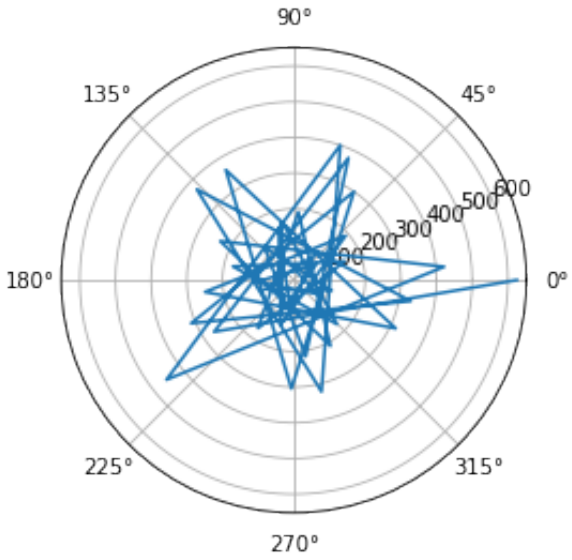
In [132]:
```
#9:plot of visibility against delays
by_origin=flights_with_weather.groupby('origin')['TotalDelay'].mean().

labels = 'LGA', 'JFK', 'EWR'

sizes=by_origin['delay']
colors = ['gold', 'yellowgreen',  'lightskyblue']
plt.pie(sizes,labels=labels,colors=colors)
```

Out[132]:
```
([<matplotlib.patches.Wedge at 0x12b2b5cc0>,
  <matplotlib.patches.Wedge at 0x12b2c11d0>,
  <matplotlib.patches.Wedge at 0x12b2c1668>],
 [Text(0.8887131819198444, 0.6482197777620687, 'LGA'),
  Text(-0.251234903183254, 1.0709253117853277, 'JFK'),
  Text(-0.42810821895749324, -1.0132735824351897, 'EWR')])
```



In [147]:
```
#10
df=WeatherDf.copy()
df['amount']=df['day'].apply(lambda x: 1)
df.head()

wind_dir=df.groupby('wind_dir')['amount'].sum().reset_index(name='amou
#wind_dir.head()
angles=wind_dir['wind_dir']
values=wind_dir['amount']

ax = plt.subplot(111, polar=True)

ax.plot(angles,values)

#The direction of winds in NYC
```

Out[147]:
```
[<matplotlib.lines.Line2D at 0x12b3472b0>]
```



In [ ]:
```
```