In [1]:
```
import numpy as np
import pandas as pd
from datetime import datetime
import seaborn as sns
import matplotlib.pyplot as plt
```

In [2]:
```
data = pd.read_csv("Uber_Request_Data.csv")
data.head(9)
```

Out[2]:

	Request id	Pickup point	Driver id	Status	Request timestamp	Drop timestamp
0	619	Airport	1.0	Trip Completed	11/7/2016 11:51	11/7/2016 13:00
1	867	Airport	1.0	Trip Completed	11/7/2016 17:57	11/7/2016 18:47
2	1807	City	1.0	Trip Completed	12/7/2016 9:17	12/7/2016 9:58
3	2532	Airport	1.0	Trip Completed	12/7/2016 21:08	12/7/2016 22:03
4	3112	City	1.0	Trip Completed	13-07-2016 08:33:16	13-07-2016 09:25:47
5	3879	Airport	1.0	Trip Completed	13-07-2016 21:57:28	13-07-2016 22:28:59
6	4270	Airport	1.0	Trip Completed	14-07-2016 06:15:32	14-07-2016 07:13:15
7	5510	Airport	1.0	Trip Completed	15-07-2016 05:11:52	15-07-2016 06:07:52
8	6248	City	1.0	Trip Completed	15-07-2016 17:57:27	15-07-2016 18:50:51

In [3]:
```
data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 6745 entries, 0 to 6744
Data columns (total 6 columns):
Request id           6745 non-null int64
Pickup point         6745 non-null object
Driver id            4095 non-null float64
Status               6745 non-null object
Request timestamp    6745 non-null object
Drop timestamp       2831 non-null object
dtypes: float64(1), int64(1), object(4)
memory usage: 316.2+ KB
```

In [4]:
```
data1 = data[["Pickup point","Status",
              "Request timestamp","Drop timestamp"]]
data1.head(9)
```

Out[4]:

	Pickup point	Status	Request timestamp	Drop timestamp
0	Airport	Trip Completed	11/7/2016 11:51	11/7/2016 13:00
1	Airport	Trip Completed	11/7/2016 17:57	11/7/2016 18:47
2	City	Trip Completed	12/7/2016 9:17	12/7/2016 9:58
3	Airport	Trip Completed	12/7/2016 21:08	12/7/2016 22:03
4	City	Trip Completed	13-07-2016 08:33:16	13-07-2016 09:25:47
5	Airport	Trip Completed	13-07-2016 21:57:28	13-07-2016 22:28:59
6	Airport	Trip Completed	14-07-2016 06:15:32	14-07-2016 07:13:15
7	Airport	Trip Completed	15-07-2016 05:11:52	15-07-2016 06:07:52
8	City	Trip Completed	15-07-2016 17:57:27	15-07-2016 18:50:51

In [5]:
```
def to_date(dat):
    dat = str(dat)
    if len(dat)>3:
        if "-" in dat:
            try:
                return datetime.strptime(dat,"%d-%m-%Y %H:%M:%S")
            except:
                return datetime.strptime(dat,"%d-%m-%Y %H:%M")
        elif "/" in dat:
            try:
                return datetime.strptime(dat,"%d/%m/%Y %H:%M:%S")
            except:
                return datetime.strptime(dat,"%d/%m/%Y %H:%M")
    else:
        return np.NaN
```

In [6]:
```
def tday(per):
    return per.strftime("%A")
```

In [7]:
```
timestamp1 = "04:00:00"
timestamp2 = "10:00:00"
timestamp3 = "16:00:00"
timestamp4 = "22:00:00"
t1 = datetime.strptime(timestamp1, "%H:%M:%S")
t2 = datetime.strptime(timestamp2, "%H:%M:%S")
t3 = datetime.strptime(timestamp3, "%H:%M:%S")
t4 = datetime.strptime(timestamp4, "%H:%M:%S")

def to_time(per):
    per = per.time()
    slot  = ""
    if per >=t1.time() and per <=t2.time():
        slot = "morning"

    elif per >t2.time() and per <=t3.time():
        slot = "daytime"

    elif per >t3.time() and per <=t4.time():
        slot = "evening"

    else:
        slot =  "midnight"
    return slot
```

In [8]:
```
def time_in_sec(per):
    try:

        return per.total_seconds()
    except:
        return pd.NaT
```

In [9]:
```
def tmonth(per):
    return per.strftime("%B")
```

In [10]:
```
data[data["Drop timestamp"]=='11/7/2016 13:00']["Drop timestamp"]="11/7/2016 13:(
```

```
C:\Users\WELCOME\Anaconda3\lib\site-packages\ipykernel_launcher.py:1: SettingWi
thCopyWarning:
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: http://pandas.pydata.org/pandas-docs/stab
le/indexing.html#indexing-view-versus-copy (http://pandas.pydata.org/pandas-doc
s/stable/indexing.html#indexing-view-versus-copy)
  """Entry point for launching an IPython kernel.
```

In [11]:
```
data1["Drop timestamp"] = data1["Drop timestamp"].apply(to_date)
data1["Request timestamp"] = data1["Request timestamp"].apply(to_date)
data1["time taken"] = data1["Drop timestamp"]- data1["Request timestamp"]
data1["total_time_in_sec"]=data1["time taken"].apply(time_in_sec)
data1["day of weak"]=data1["Request timestamp"].apply(tday)
data1["month"] = data1["Request timestamp"].apply(tmonth)
data1["time_slot"] = data1["Request timestamp"].apply(to_time)
```

```
C:\Users\WELCOME\Anaconda3\lib\site-packages\ipykernel_launcher.py:1: SettingWi
thCopyWarning:
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: http://pandas.pydata.org/pandas-docs/stab
le/indexing.html#indexing-view-versus-copy (http://pandas.pydata.org/pandas-doc
s/stable/indexing.html#indexing-view-versus-copy)
  """Entry point for launching an IPython kernel.
C:\Users\WELCOME\Anaconda3\lib\site-packages\ipykernel_launcher.py:2: SettingWi
thCopyWarning:
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: http://pandas.pydata.org/pandas-docs/stab
le/indexing.html#indexing-view-versus-copy (http://pandas.pydata.org/pandas-doc
s/stable/indexing.html#indexing-view-versus-copy)

C:\Users\WELCOME\Anaconda3\lib\site-packages\ipykernel_launcher.py:3: SettingWi
thCopyWarning:
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: http://pandas.pydata.org/pandas-docs/stab
le/indexing.html#indexing-view-versus-copy (http://pandas.pydata.org/pandas-doc
s/stable/indexing.html#indexing-view-versus-copy)
  This is separate from the ipykernel package so we can avoid doing imports unt
il
```

In [12]:
```
data1.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 6745 entries, 0 to 6744
Data columns (total 9 columns):
Pickup point         6745 non-null object
Status               6745 non-null object
Request timestamp    6745 non-null datetime64[ns]
Drop timestamp       2831 non-null datetime64[ns]
time taken           2831 non-null timedelta64[ns]
total_time_in_sec    2831 non-null float64
day of weak          6745 non-null object
month                6745 non-null object
time_slot            6745 non-null object
dtypes: datetime64[ns](2), float64(1), object(5), timedelta64[ns](1)
memory usage: 474.3+ KB
```

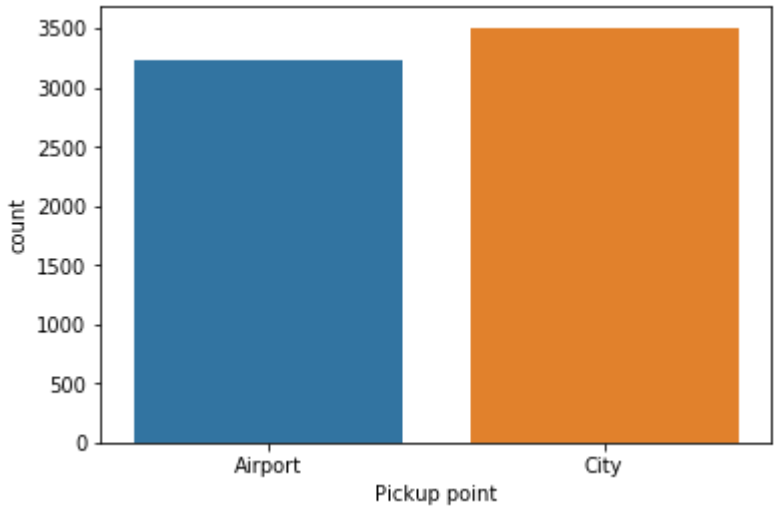
In [13]:
```
data1.head()
```

Out[13]:

	Pickup point	Status	Request timestamp	Drop timestamp	time taken	total_time_in_sec	day of weak	month	time_
0	Airport	Trip Completed	2016-07-11 11:51:00	2016-07-11 13:00:00	01:09:00	4140.0	Monday	July	day
1	Airport	Trip Completed	2016-07-11 17:57:00	2016-07-11 18:47:00	00:50:00	3000.0	Monday	July	eve
2	City	Trip Completed	2016-07-12 09:17:00	2016-07-12 09:58:00	00:41:00	2460.0	Tuesday	July	mor
3	Airport	Trip Completed	2016-07-12 21:08:00	2016-07-12 22:03:00	00:55:00	3300.0	Tuesday	July	eve
4	City	Trip Completed	2016-07-13 08:33:16	2016-07-13 09:25:47	00:52:31	3151.0	Wednesday	July	mor

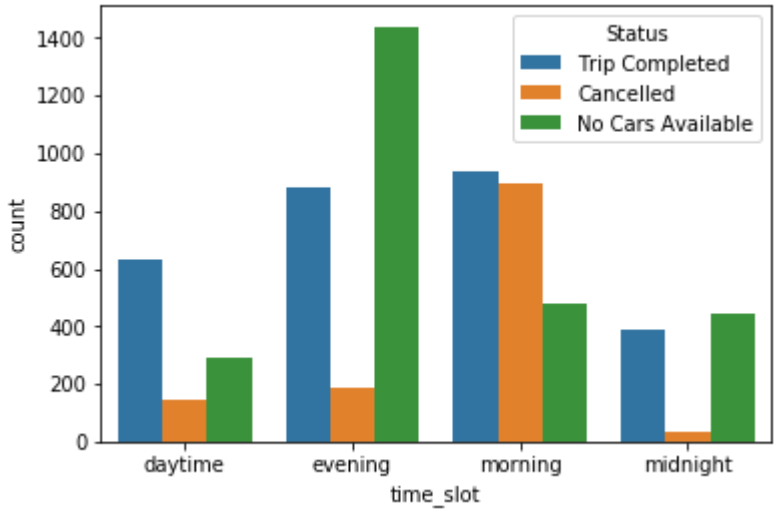
In [14]:
```
sns.countplot(x ="Pickup point",data = data1)
```

Out[14]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x24d11efe898>
```



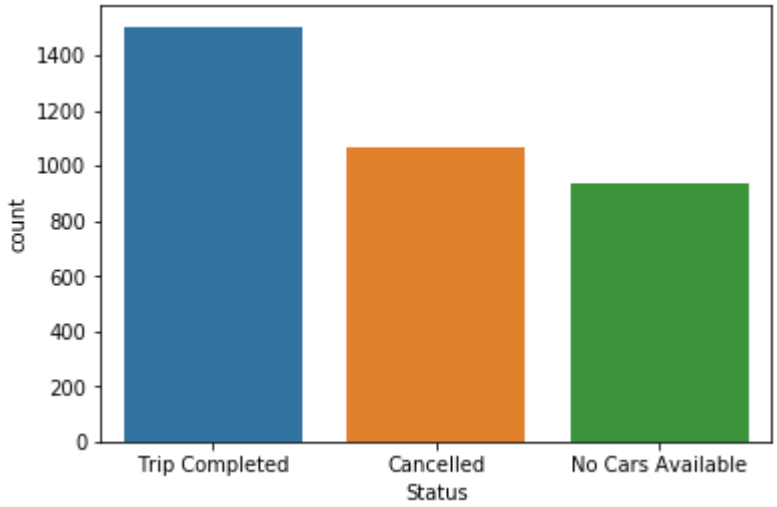
In [15]:
```
sns.countplot(x = "time_slot",data= data1,hue = "Status")
```

Out[15]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x24d11e12d68>
```



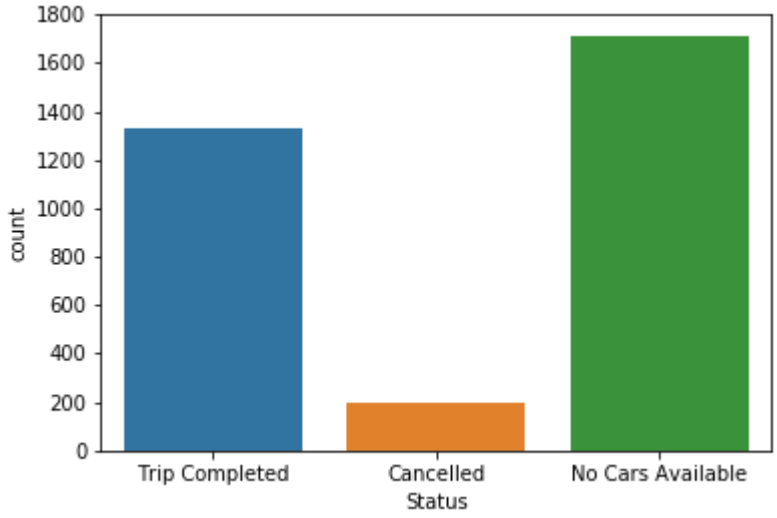
In [16]:
```
sns.countplot(x = "Status",data= data1[data1["Pickup point"]=="City"])
```

Out[16]: <matplotlib.axes._subplots.AxesSubplot at 0x24d13175cc0>



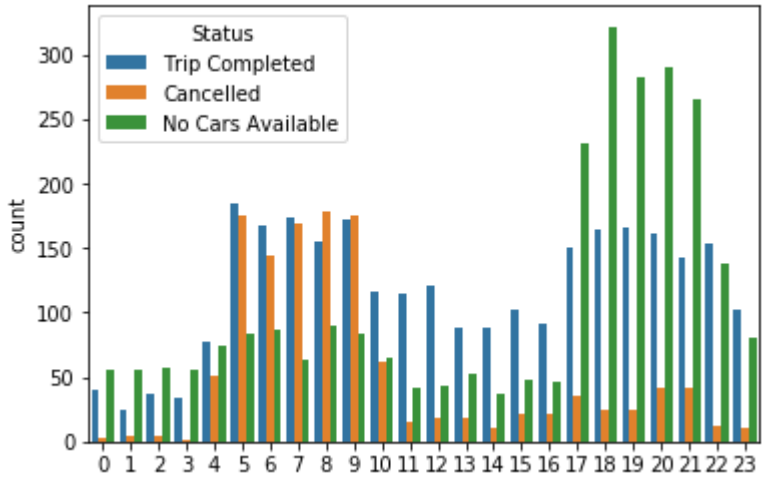
In [17]:
```
sns.countplot(x = "Status",data= data1[data1["Pickup point"]!="City"])
```

Out[17]: <matplotlib.axes._subplots.AxesSubplot at 0x24d131ca6d8>



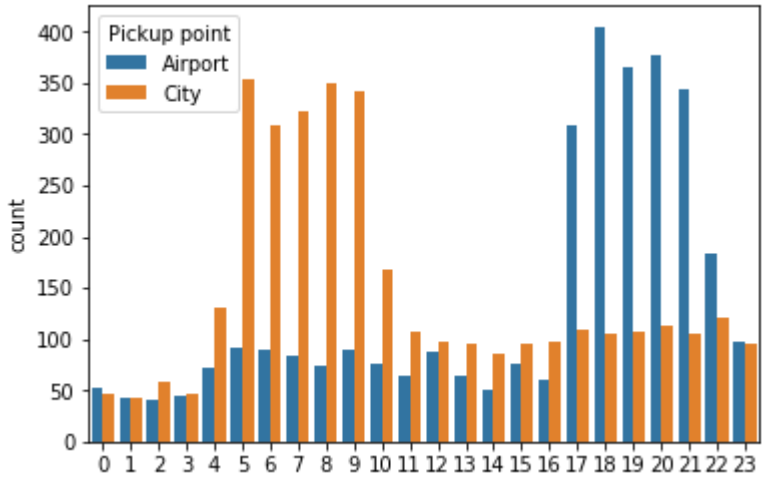
In [18]:
```
a= []
for i in range(len(data1["Request timestamp"])):
    a.append(data1["Request timestamp"][i].hour)
sns.countplot(x =a ,hue=data1["Status"])
```

Out[18]: <matplotlib.axes._subplots.AxesSubplot at 0x24d13247b70>



In [19]:
```
sns.countplot(x =a ,hue=data1["Pickup point"])
```

Out[19]: <matplotlib.axes._subplots.AxesSubplot at 0x24d13348fd0>

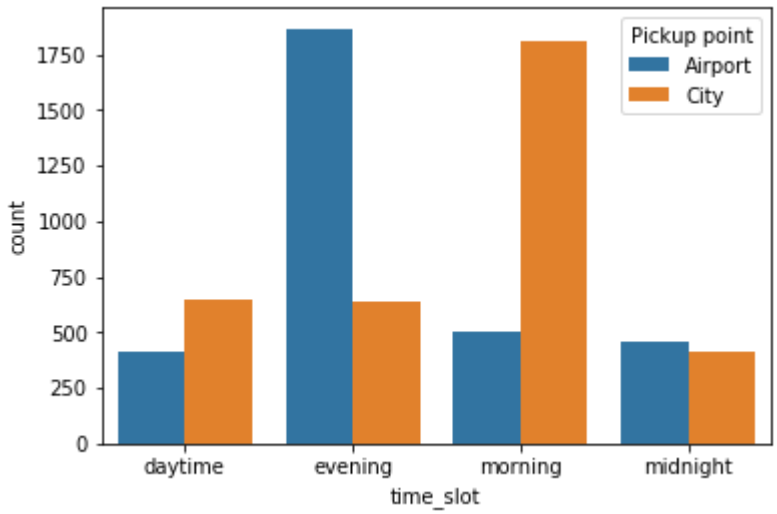


In [20]:
```
sns.countplot(x =data1["time_slot"] ,hue=data1["Pickup point"])
"""

   more evening requestes at airport
   more morning requeses at city

"""
```

Out[20]:
```
'\n\n   more evening requestes at airport\n   more morning requeses at city\n
\n'
```



In [21]:
```
ml_data = data1[["Pickup point","Status","total_time_in_sec","day of weak","time_
ml_data.head()
```

Out[21]:

	Pickup point	Status	total_time_in_sec	day of weak	time_slot
0	Airport	Trip Completed	4140.0	Monday	daytime
1	Airport	Trip Completed	3000.0	Monday	evening
2	City	Trip Completed	2460.0	Tuesday	morning
3	Airport	Trip Completed	3300.0	Tuesday	evening
4	City	Trip Completed	3151.0	Wednesday	morning

In [22]:
```
X= ml_data.iloc[:,[0,3,4]]
X.head()
```

Out[22]:

	Pickup point	day of weak	time_slot
0	Airport	Monday	daytime
1	Airport	Monday	evening
2	City	Tuesday	morning
3	Airport	Tuesday	evening
4	City	Wednesday	morning

In [23]:
```
X = ml_data.iloc[:,[0,3,4]].values
y = ml_data.iloc[:, [1]].values


from sklearn.preprocessing import LabelEncoder, OneHotEncoder
labelencoder_0 = LabelEncoder()


X[:, 0] = labelencoder_0.fit_transform(X[:, 0])
X[:, 1] = labelencoder_0.fit_transform(X[:, 1])
X[:, 2] = labelencoder_0.fit_transform(X[:, 2])


onehotencoder = OneHotEncoder(categorical_features = [0,1,2])
X = onehotencoder.fit_transform(X).toarray()
```

```
C:\Users\WELCOME\Anaconda3\lib\site-packages\sklearn\preprocessing\_encoders.p
y:368: FutureWarning: The handling of integer data will change in version 0.22.
Currently, the categories are determined based on the range [0, max(values)], w
hile in the future they will be determined based on the unique values.
If you want the future behaviour and silence this warning, you can specify "cat
egories='auto'".
In case you used a LabelEncoder before this OneHotEncoder to convert the catego
ries to integers, then you can now use the OneHotEncoder directly.
  warnings.warn(msg, FutureWarning)
C:\Users\WELCOME\Anaconda3\lib\site-packages\sklearn\preprocessing\_encoders.p
y:390: DeprecationWarning: The 'categorical_features' keyword is deprecated in
version 0.20 and will be removed in 0.22. You can use the ColumnTransformer ins
tead.
  "use the ColumnTransformer instead.", DeprecationWarning)
```

In [24]:
```
pd.DataFrame(X).head()
```

Out[24]:

	0	1	2	3	4	5	6	7	8	9	10
0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
1	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
2	0.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	1.0
3	1.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0
4	0.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0

In [25]:
```
X = pd.DataFrame(X[:,[0,2,3,4,5,7,8,9]]).values
pd.DataFrame(X).head()
```

Out[25]:

	0	1	2	3	4	5	6	7
0	1.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0
1	1.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0
2	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
3	1.0	0.0	0.0	0.0	1.0	0.0	1.0	0.0
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

In [26]:
```
y
```

Out[26]:
```
array([['Trip Completed'],
       ['Trip Completed'],
       ['Trip Completed'],
       ...,
       ['No Cars Available'],
       ['No Cars Available'],
       ['No Cars Available']], dtype=object)
```

In [27]:
```
from sklearn.preprocessing import LabelEncoder, OneHotEncoder
labelencoder_y = LabelEncoder()
y = labelencoder_y.fit_transform(y)
```

```
C:\Users\WELCOME\Anaconda3\lib\site-packages\sklearn\preprocessing\label.py:23
5: DataConversionWarning: A column-vector y was passed when a 1d array was expe
cted. Please change the shape of y to (n_samples, ), for example using ravel().
  y = column_or_1d(y, warn=True)
```

In [28]:
```
y = ml_data.iloc[:, [1,0]].values
from sklearn.preprocessing import LabelEncoder, OneHotEncoder
labelencoder_y = LabelEncoder()
y[:,0] = labelencoder_y.fit_transform(y[:,0])

y[:,1] = labelencoder_y.fit_transform(y[:,1])
onehotencoder = OneHotEncoder(categorical_features = [0])
y = onehotencoder.fit_transform(y).toarray()
```

```
C:\Users\WELCOME\Anaconda3\lib\site-packages\sklearn\preprocessing\_encoders.p
y:368: FutureWarning: The handling of integer data will change in version 0.22.
Currently, the categories are determined based on the range [0, max(values)], w
hile in the future they will be determined based on the unique values.
If you want the future behaviour and silence this warning, you can specify "cat
egories='auto'".
In case you used a LabelEncoder before this OneHotEncoder to convert the catego
ries to integers, then you can now use the OneHotEncoder directly.
  warnings.warn(msg, FutureWarning)
C:\Users\WELCOME\Anaconda3\lib\site-packages\sklearn\preprocessing\_encoders.p
y:390: DeprecationWarning: The 'categorical_features' keyword is deprecated in
version 0.20 and will be removed in 0.22. You can use the ColumnTransformer ins
tead.
  "use the ColumnTransformer instead.", DeprecationWarning)
```

In [29]:
```
y
```

Out[29]:
```
array([[0., 0., 1., 0.],
       [0., 0., 1., 0.],
       [0., 0., 1., 1.],
       ...,
       [0., 1., 0., 1.],
       [0., 1., 0., 1.],
       [0., 1., 0., 0.]])
```

In [30]:
```
y=y[:,:-1]
```

In [31]:
```
y = y[:,:-1]
```

In [32]:
```
y
```

Out[32]:
```
array([[0., 0.],
       [0., 0.],
       [0., 0.],
       ...,
       [0., 1.],
       [0., 1.],
       [0., 1.]])
```

In [33]:
```
from sklearn.ensemble import RandomForestRegressor
regressor = RandomForestRegressor(n_estimators = 10, random_state = 0)
regressor.fit(X, y)
```

Out[33]:
```
RandomForestRegressor(bootstrap=True, criterion='mse', max_depth=None,
           max_features='auto', max_leaf_nodes=None,
           min_impurity_decrease=0.0, min_impurity_split=None,
           min_samples_leaf=1, min_samples_split=2,
           min_weight_fraction_leaf=0.0, n_estimators=10, n_jobs=None,
           oob_score=False, random_state=0, verbose=0, warm_start=False)
```

In [34]:
```
def ml_array(per1,per2):

    day_dic={"Monday" : "0100","Tuesday" : "0001","Wednesday" : "0000","Thursday"
    timeslot_dict = {"daytime" : "100","evening" : "010","morning" : "000","midn
    predict_dict = {"00" : "trip will be completed","01":"no cars available","10
    arr = []
    pre_arr=""
    arr.append(int(per2))
    for i in day_dic[tday(per1)]:
        arr.append(int(i))
    for i in timeslot_dict[to_time(per1)]:
        arr.append(int(i))
    temp = regressor.predict([arr])
    #predict_dict = {"00" : "trip will be completed","01":"no cars available","1
    try:

        return predict_dict[str(int(temp[0][0]))+str(int(temp[0][1]))]
    except:
        return "enter proper date"
```

In [35]:
```
d = to_date(input("enter date\n format day-month-year hour:min:sec/\n\n"))
p = input("airport = 1\ncity = 0\n\n")
ml_array(d,p)
```

```
enter date
 format day-month-year hour:min:sec/

10-02-2020 12:20:00
airport = 1
city = 0

1
```

Out[35]:
```
'trip will be completed'
```

In [36]:
```
data1.tail()
```

Out[36]:

	Pickup point	Status	Request timestamp	Drop timestamp	time taken	total_time_in_sec	day of weak	month	time_slot
6740	City	No Cars Available	2016-07-15 23:49:03	NaT	NaT	NaN	Friday	July	midnight
6741	Airport	No Cars Available	2016-07-15 23:50:05	NaT	NaT	NaN	Friday	July	midnight
6742	City	No Cars Available	2016-07-15 23:52:06	NaT	NaT	NaN	Friday	July	midnight
6743	City	No Cars Available	2016-07-15 23:54:39	NaT	NaT	NaN	Friday	July	midnight
6744	Airport	No Cars Available	2016-07-15 23:55:03	NaT	NaT	NaN	Friday	July	midnight

In [ ]:

In [ ]: