Roller Coaster project

February 5, 2022

[1]:
```
import pandas as pd
import matplotlib.pyplot as plt
```

[2]:
```
wood_winners = pd.read_csv(r'Golden_Ticket_Award_Winners_Wood.csv')
steel_winners = pd.read_csv(r'Golden_Ticket_Award_Winners_Steel.csv')
```

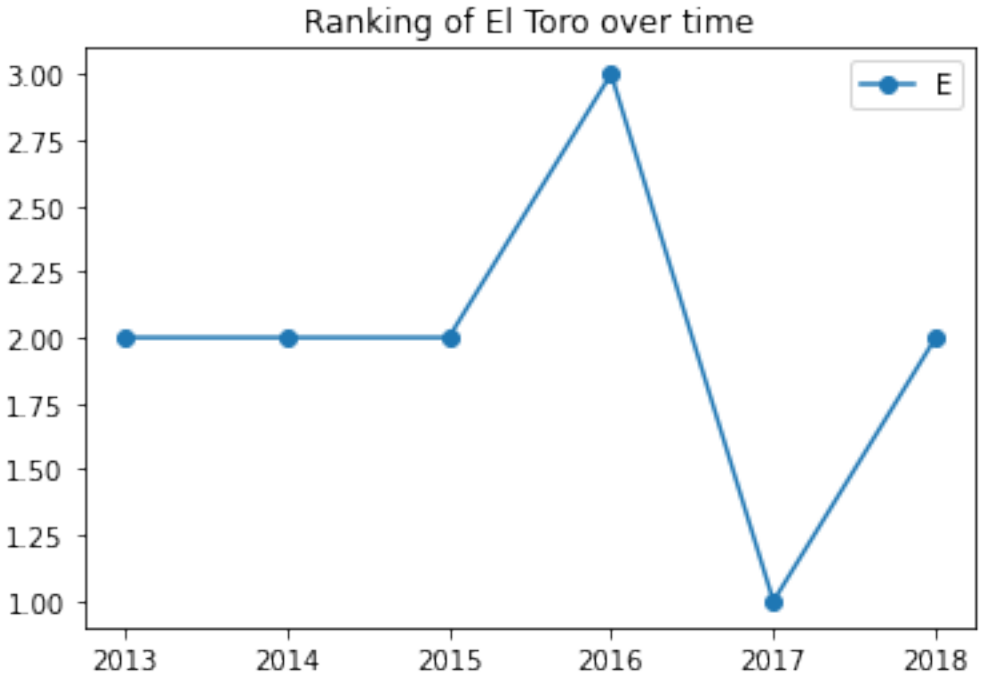
[3]:
```
print(wood_winners.head())
```

```
   Rank          Name                       Park             Location  \
0     1  Boulder Dash            Lake Compounce       Bristol, Conn.
1     2       El Toro  Six Flags Great Adventure        Jackson, N.J.
2     3       Phoenix  Knoebels Amusement Resort        Elysburg, Pa.
3     4    The Voyage             Holiday World    Santa Claus, Ind.
4     5   Thunderhead                 Dollywood  Pigeon Forge, Tenn.

           Supplier  Year Built  Points  Year of Rank
0               CCI        2000    1333          2013
1           Intamin        2006    1302          2013
2  Dinn/PTC-Schmeck        1985    1088          2013
3     Gravity Group        2006    1086          2013
4              GCII        2004     923          2013
```

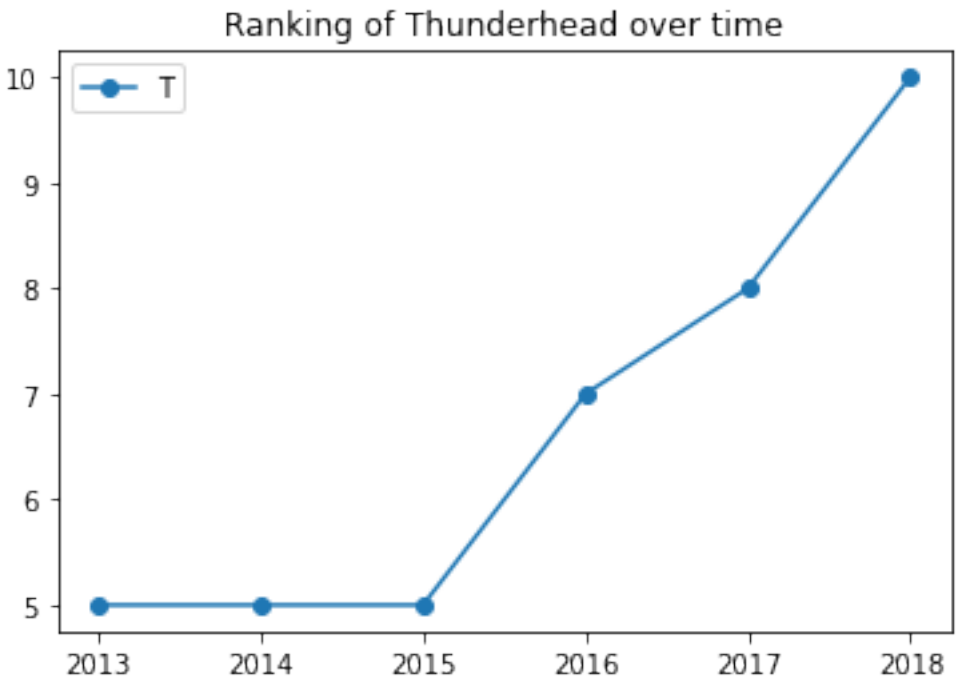
[4]:
```
print(steel_winners.head())
```

```
   Rank               Name                       Park          Location  \
0     1   Millennium Force                 Cedar Point    Sandusky, Ohio
1     2            Bizarro      Six Flags New England     Agawam, Mass.
2     3  Expedition GeForce               Holiday Park  Hassloch, Germany
3     4             Nitro  Six Flags Great Adventure     Jackson, N.J.
4     5   Apollo's Chariot  Busch Gardens Williamsburg  Williamsburg, Va.

  Supplier  Year Built  Points  Year of Rank
0  Intamin        2000    1204          2013
1  Intamin        2000    1011          2013
2  Intamin        2001     598          2013
3      B&M        2001     596          2013
4      B&M        1999     542          2013
```

[22]:
```
def ranking_tracker(name, park_name, df):
    years = df['Year of Rank'][(df.Name == name) & (df.Park == park_name)]
    coaster_rankings = df.Rank[(df.Name == name) & (df.Park == park_name)]
    plt.plot(years, coaster_rankings, marker = 'o')
    plt.legend(name)
    plt.title("Ranking of " + name + " over time")
    plt.show()

ranking_tracker('El Toro', "Six Flags Great Adventure", wood_winners)
```



[23]:
```
ranking_tracker('Thunderhead', "Dollywood", wood_winners)
```

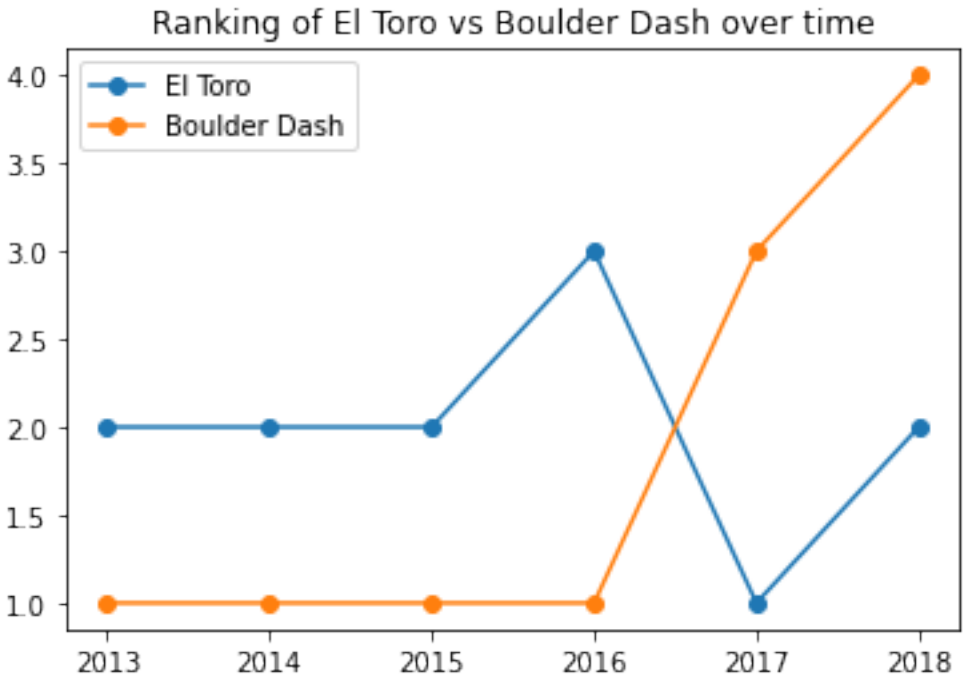


[20]:
```
print(wood_winners[(wood_winners.Name == "El Toro") & (wood_winners.Park ==␣
↪"Six Flags Great Adventure")])
```

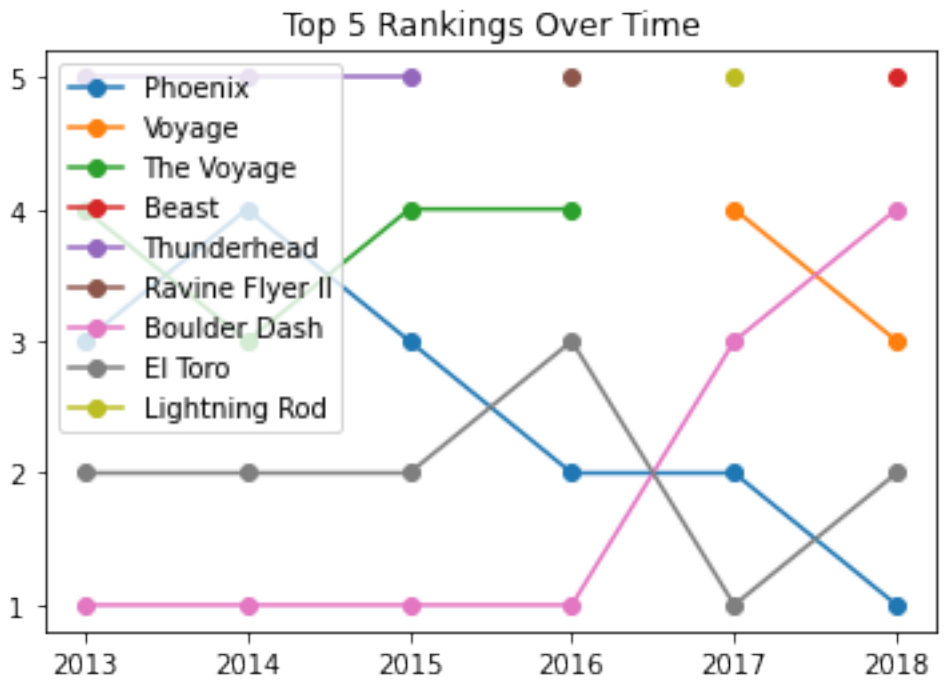
```
     Rank     Name                          Park       Location Supplier  \
1       2  El Toro  Six Flags Great Adventure  Jackson, N.J.  Intamin
11      2  El Toro  Six Flags Great Adventure  Jackson, N.J.  Intamin
21      2  El Toro  Six Flags Great Adventure  Jackson, N.J.  Intamin
32      3  El Toro  Six Flags Great Adventure  Jackson, N.J.  Intamin
80      1  El Toro  Six Flags Great Adventure  Jackson, N.J.  Intamin
131     2  El Toro  Six Flags Great Adventure  Jackson, N.J.  Intamin

     Year Built  Points  Year of Rank
1          2006    1302          2013
11         2006    1291          2014
21         2006    1464          2015
32         2006    1121          2016
80         2009    1241          2017
131        2006    1197          2018
```

[28]:
```
def ranking_tracker_compare(name1, park_name1, name2, park_name2, df):
    years1 = df['Year of Rank'][(df.Name == name1) & (df.Park == park_name1)]
    coaster_rankings1 = df.Rank[(df.Name == name1) & (df.Park == park_name1)]
    plt.plot(years1, coaster_rankings1, marker = 'o')
    years2 = df['Year of Rank'][(df.Name == name2) & (df.Park == park_name2)]
    coaster_rankings2 = df.Rank[(df.Name == name2) & (df.Park == park_name2)]
```

```
    plt.plot(years2, coaster_rankings2, marker = 'o')
    plt.legend([name1, name2])
    plt.title("Ranking of " + name1 + " vs " + name2 + " over time")
    plt.show()

ranking_tracker_compare('El Toro', "Six Flags Great Adventure", "Boulder Dash",␣
 ↪"Lake Compounce", wood_winners)
```



[98]:
```
def ranking_tracker_topn(n, df):
    top_n_rankings = df[df['Rank'] <= n]
    ax = plt.subplot()

    for coaster in set(top_n_rankings['Name']):
        coaster_rankings = top_n_rankings[top_n_rankings['Name'] == coaster]
        ax.plot(coaster_rankings['Year of␣
 ↪Rank'],coaster_rankings['Rank'],label=coaster, marker = 'o')
    plt.title("Top " + str(n) + " Rankings Over Time")
    plt.legend()
    ax.set_yticks(range(1,n+1))
    plt.show()


ranking_tracker_topn(5, wood_winners)
```

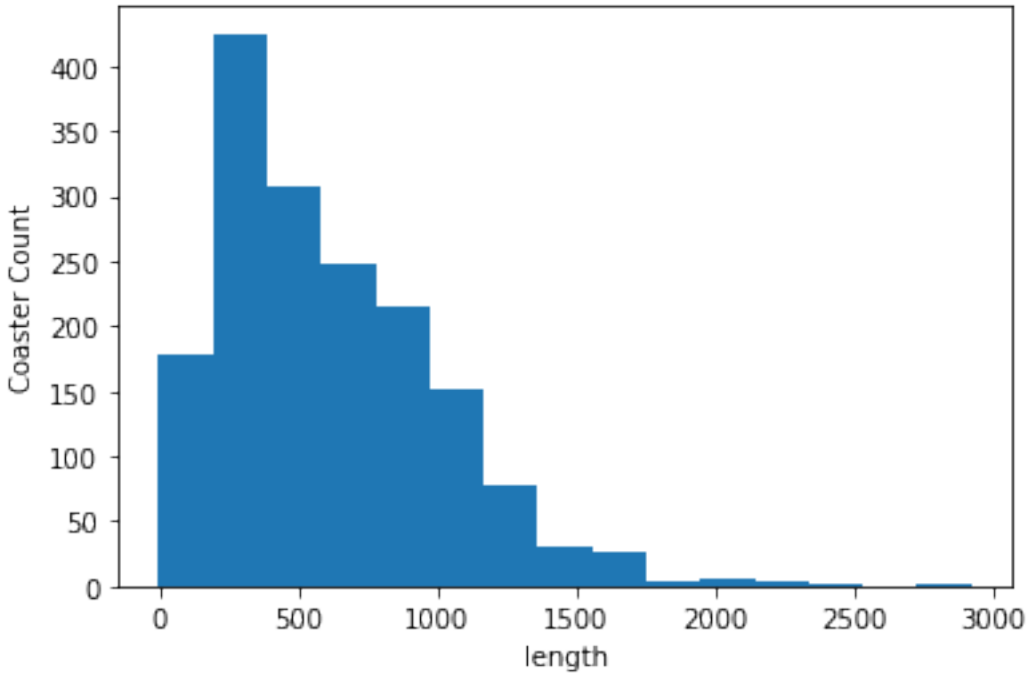


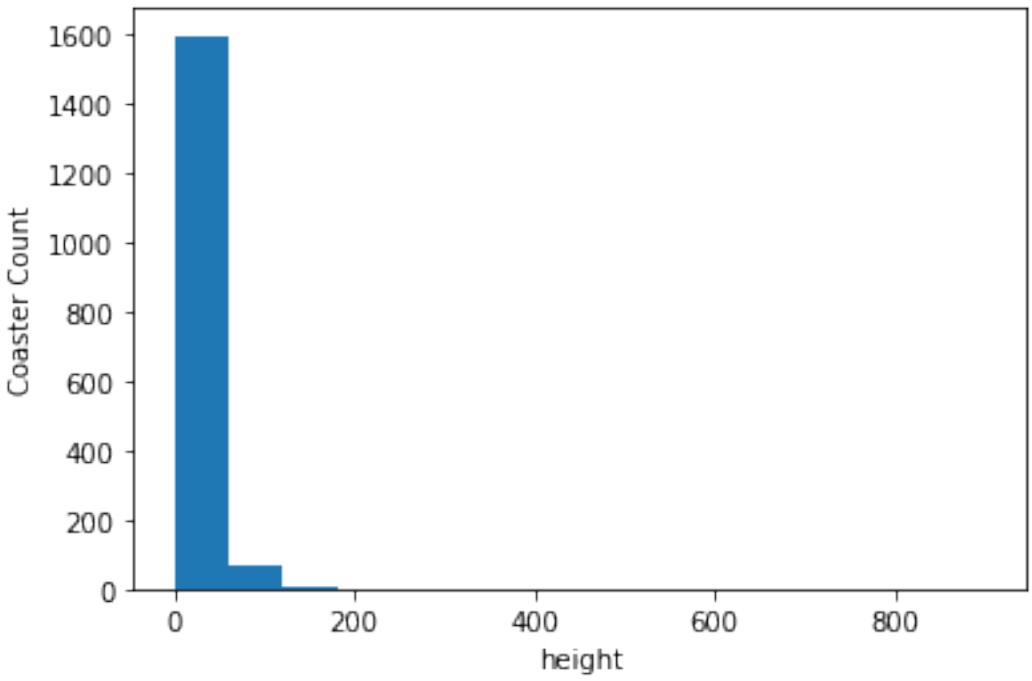
[38]:
```
roller_coasters = pd.read_csv('roller_coasters.csv')
print(roller_coasters.head())
```

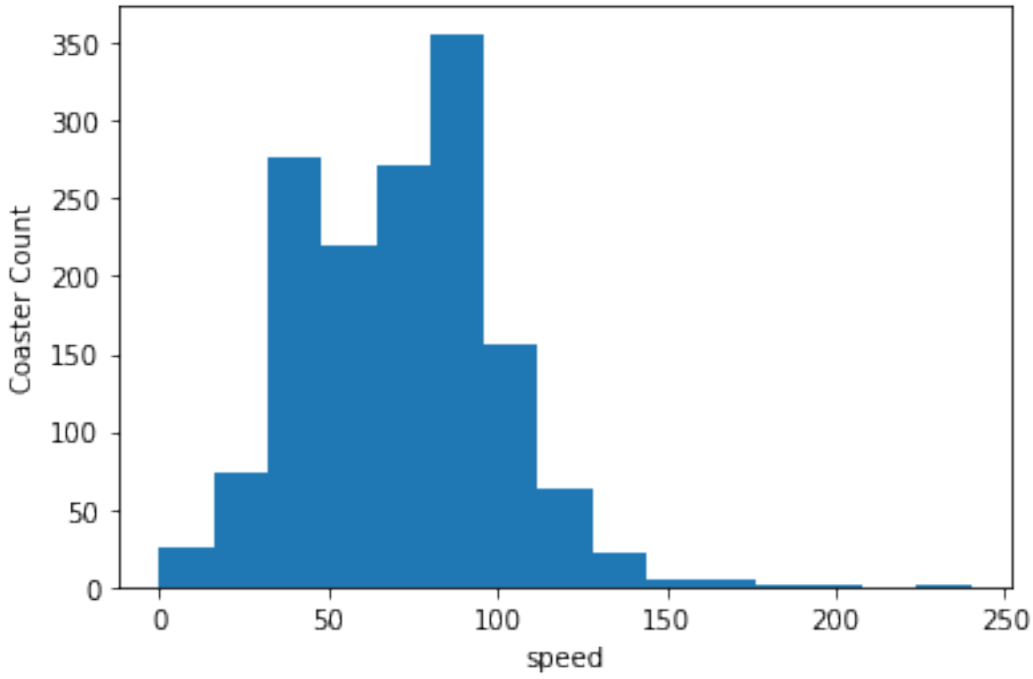
```
           name material_type seating_type  speed  height  length  \
0      Goudurix         Steel     Sit Down   75.0    37.0   950.0
1  Dream catcher         Steel    Suspended   45.0    25.0   600.0
2     Alucinakis         Steel     Sit Down   30.0     8.0   250.0
3      Anaconda        Wooden     Sit Down   85.0    35.0  1200.0
4        Azteka         Steel     Sit Down   55.0    17.0   500.0

   num_inversions     manufacturer           park            status
0             7.0           Vekoma    Parc Asterix  status.operating
1             0.0           Vekoma   Bobbejaanland  status.operating
2             0.0         Zamperla    Terra Mítica  status.operating
3             0.0  William J. Cobb  Walygator Parc  status.operating
4             0.0           Soquet          Le Pal  status.operating
```

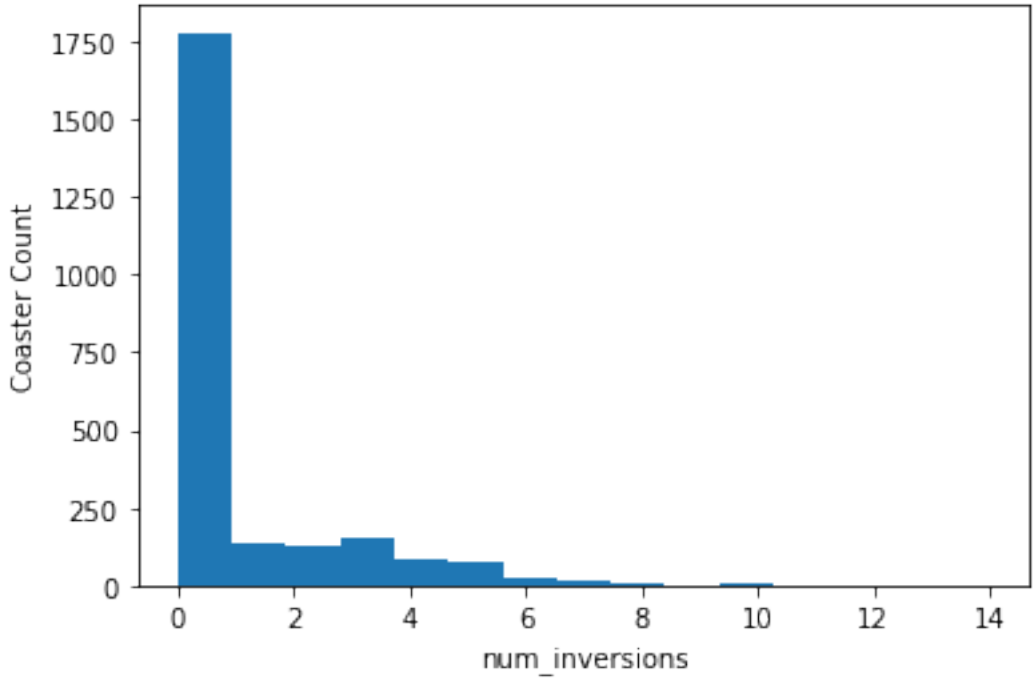
[54]:
```
def histogramer(df, column_name):
    plt.hist(df[column_name], bins = 15)
    plt.ylabel('Coaster Count')
    plt.xlabel(str(column_name))
    plt.show()

histogramer(roller_coasters, 'length')
histogramer(roller_coasters, 'height')
```

```
histogramer(roller_coasters, 'speed')
histogramer(roller_coasters, 'num_inversions')
```



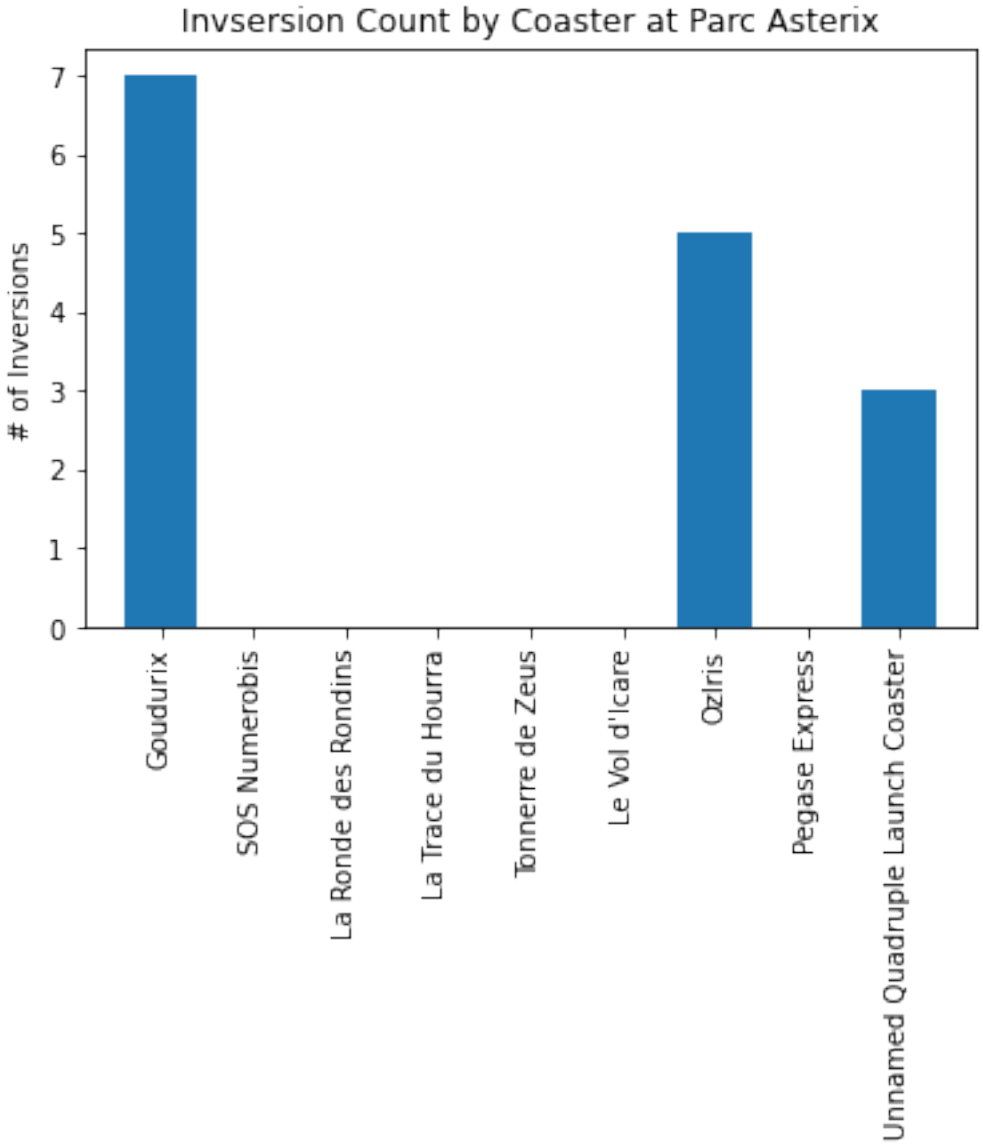


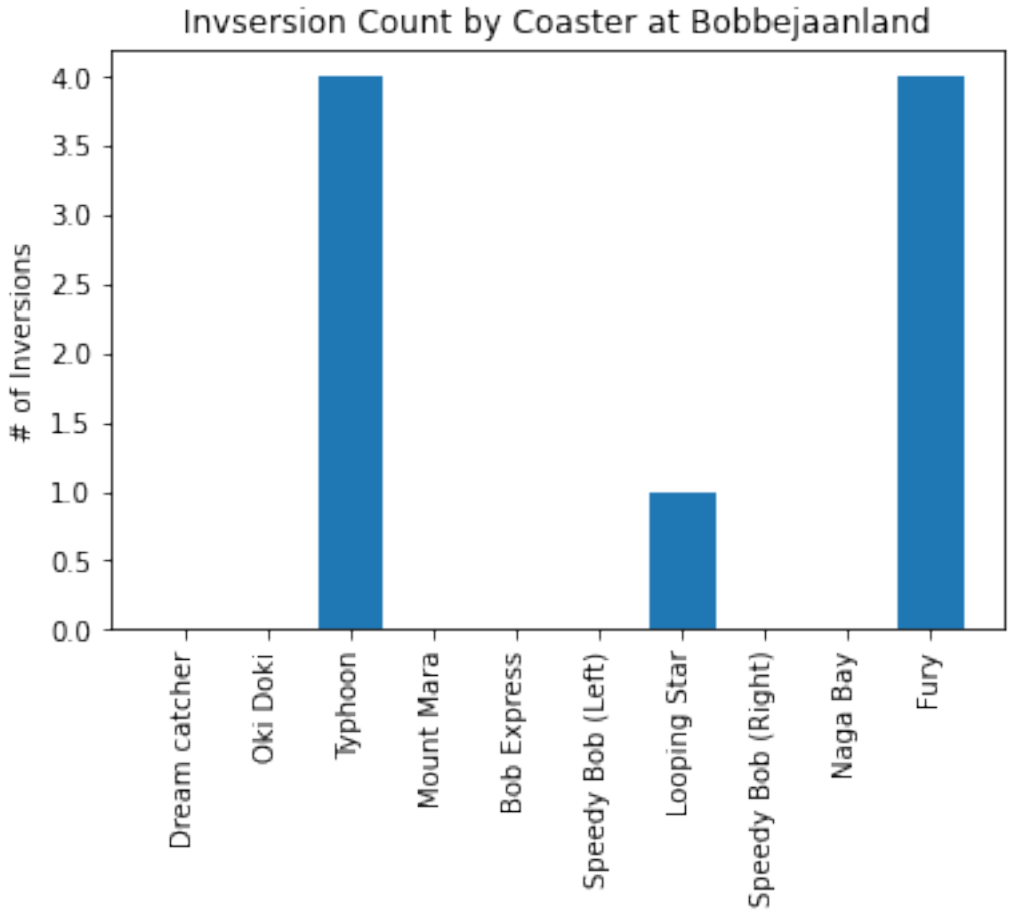




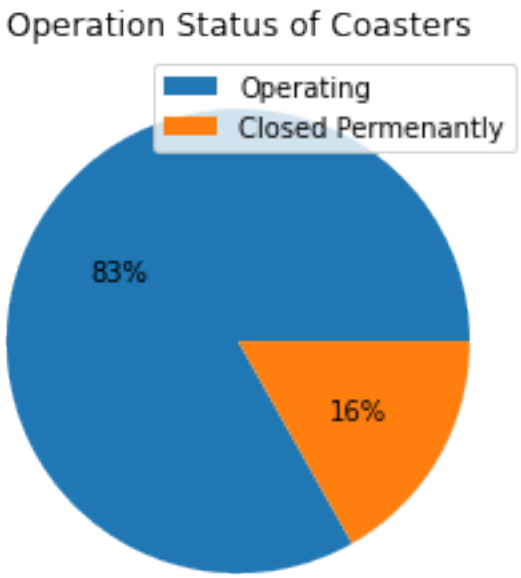
[72]:
```
def inversion_bar(df, park_name):
    park_df = df[df.park == park_name]
```

```
    ax = plt.subplot()
    x_vals = range(len(park_df))
    y_vals = park_df.num_inversions.tolist()
    plt.bar(x_vals, y_vals)
    ax.set_xticks(x_vals)
    ax.set_xticklabels(park_df.name, rotation = 90)
    plt.ylabel('# of Inversions')
    plt.title("Invsersion Count by Coaster at " + park_name)
    plt.show()

inversion_bar(roller_coasters, "Parc Asterix")
inversion_bar(roller_coasters, "Bobbejaanland")
```

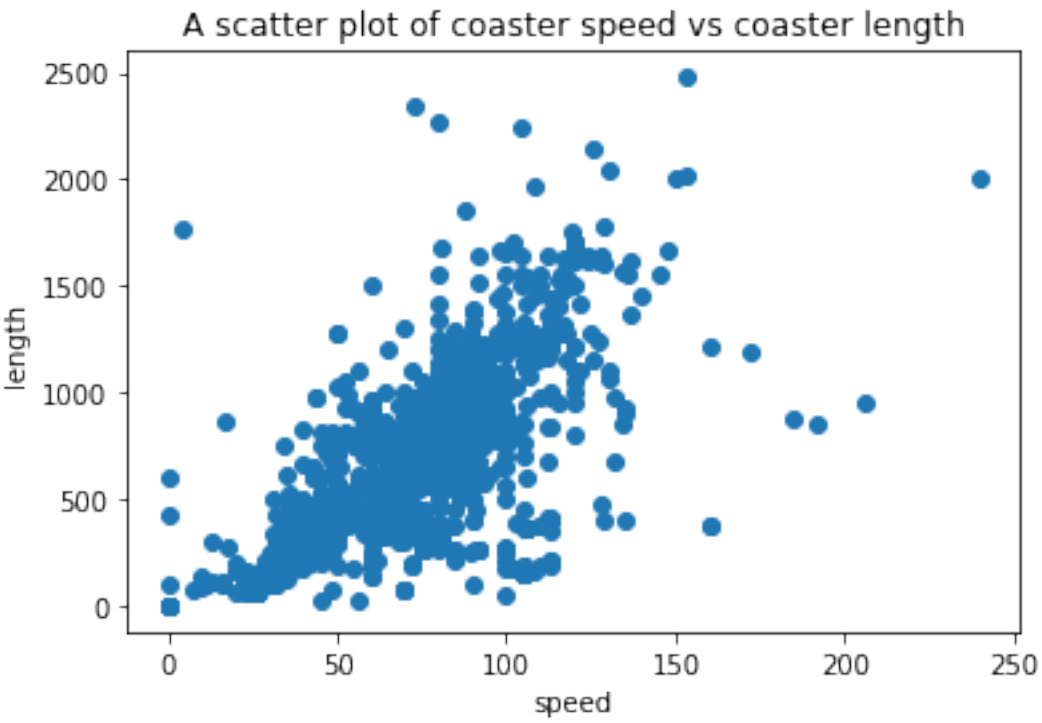


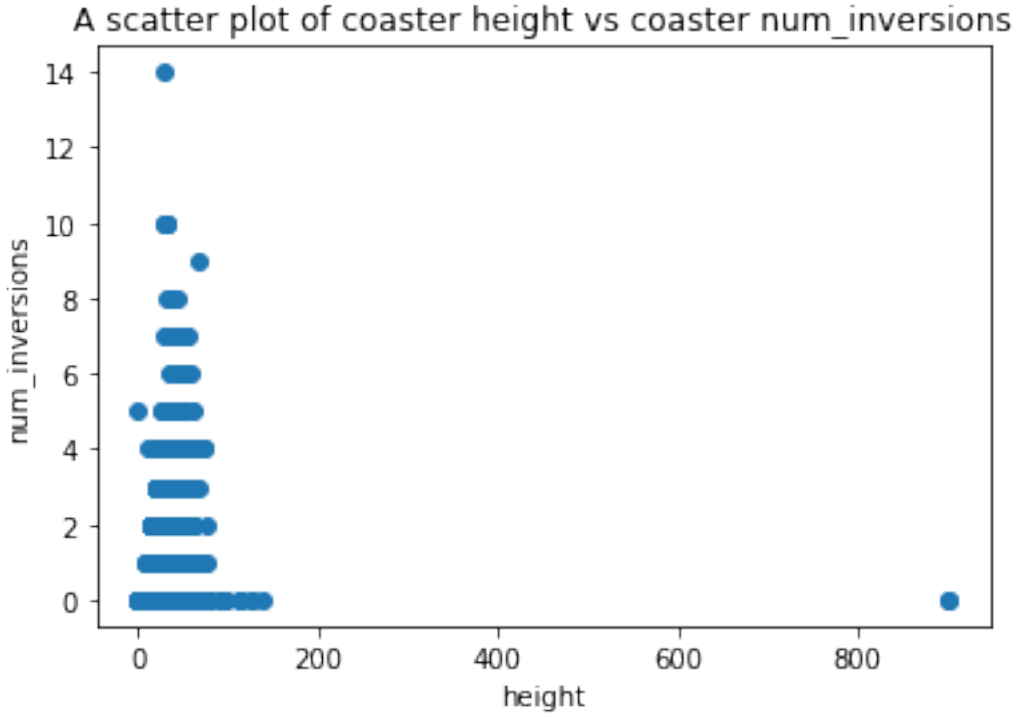


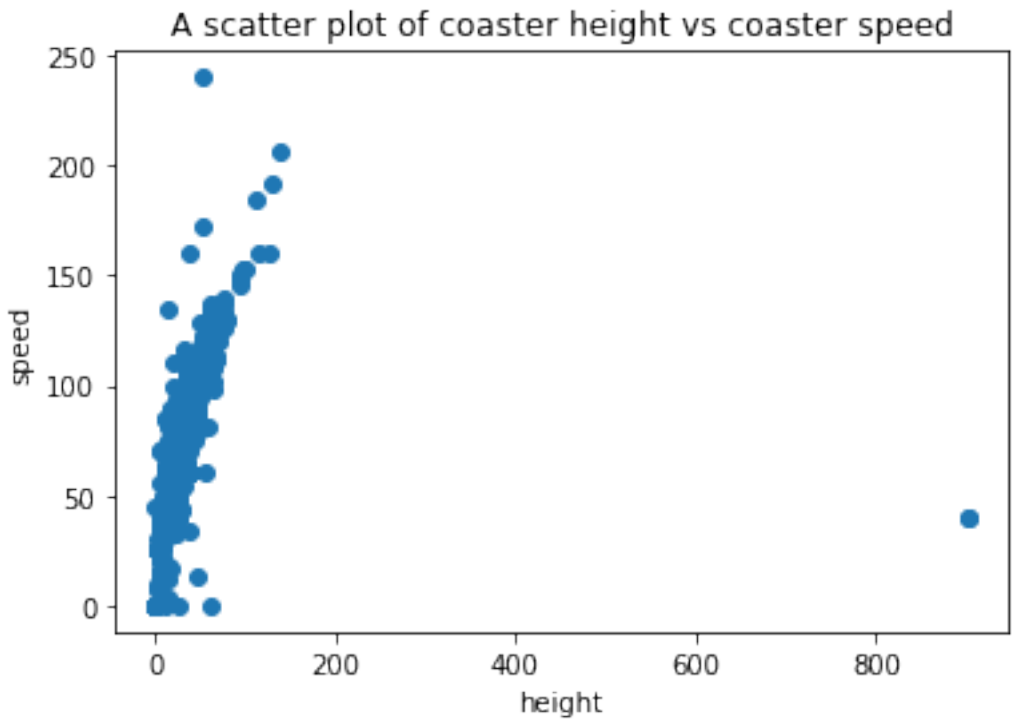
[87]:
```
#print(roller_coasters.status.value_counts())

def operation_status_pie(df):
    operating_coasters = df[df['status'] == 'status.operating']
    closed_coasters = df[df['status'] == 'status.closed.definitely']
    status_counts = [len(operating_coasters), len(closed_coasters)]
    plt.pie(status_counts, autopct = '%d%%')
    labels = ["Operating", "Closed Permenantly"]
    plt.legend(labels)
    plt.title("Operation Status of Coasters")
    plt.show()

operation_status_pie(roller_coasters)
```



[100]:
```
def scatter_two(df, col1, col2):
    x = df[col1]
    y = df[col2]
    plt.scatter(x, y)
    plt.xlabel(str(col1))
    plt.ylabel(str(col2))
    plt.title("A scatter plot of coaster " + str(col1) + " vs coaster " +␣
 ↪str(col2))
    plt.show()

scatter_two(roller_coasters, 'speed', 'length')
scatter_two(roller_coasters, 'height', 'num_inversions')
scatter_two(roller_coasters, 'height', 'speed')
```

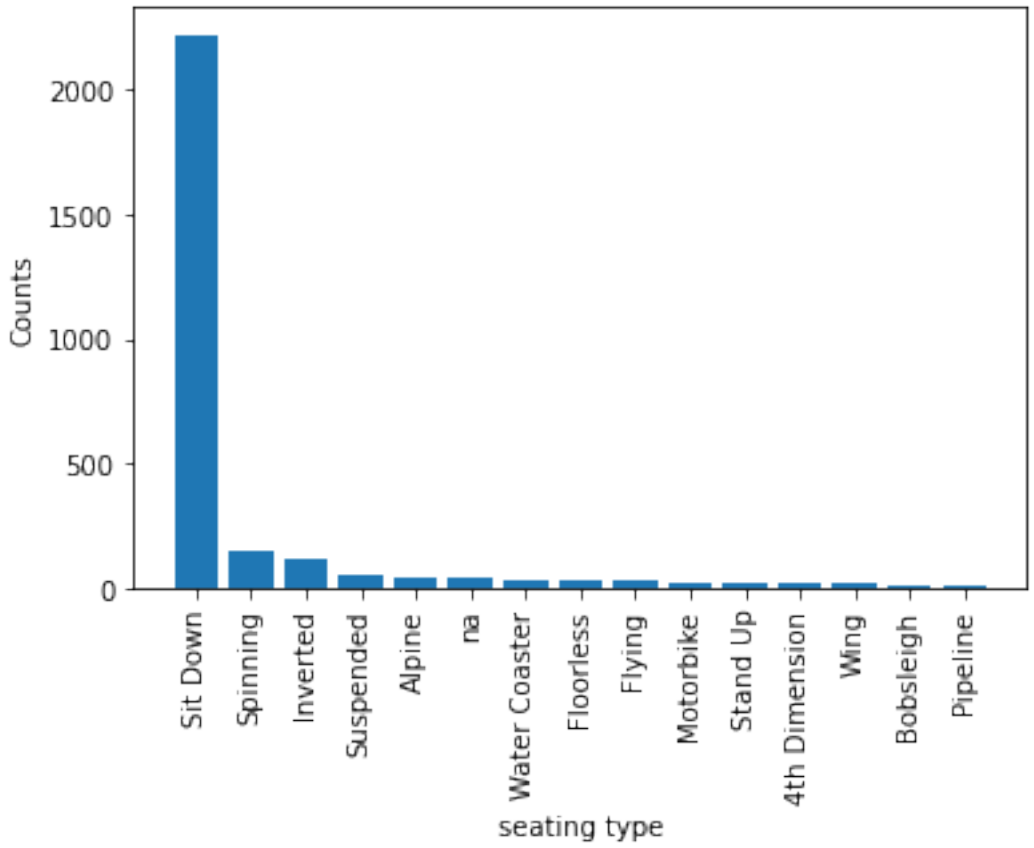

A scatter plot of coaster speed vs coaster length
length
speed
0
500
1000
1500
2000
2500
0
50
100
150
200
250

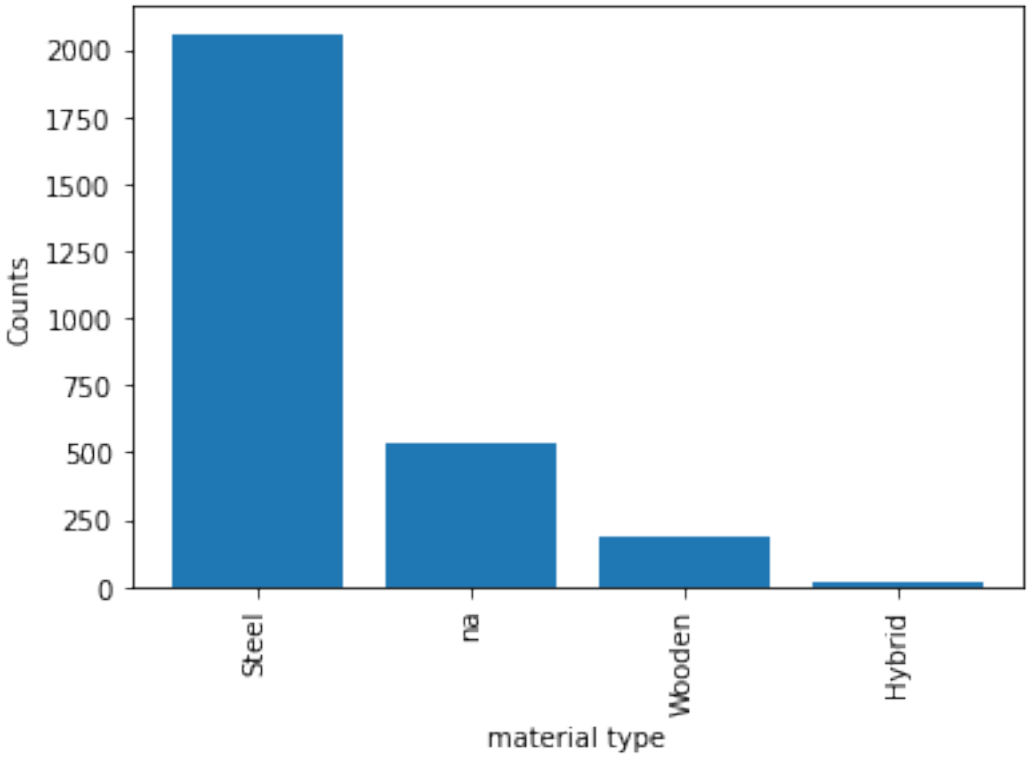

A scatter plot of coaster height vs coaster num_inversions
num_inversions
height
0
2
4
6
8
10
12
14
0
200
400
600
800



[130]:
```
seating_type_count = roller_coasters.seating_type.value_counts()
#print(seating_type_count)
seating_type_count_df = pd.DataFrame(seating_type_count).reset_index()
print(seating_type_count_df)
#plt.bar(seating_type_count_df.index, seating_type_count_df.seating_type)
#plt.show()

def make_a_bar(df, cat_column):
    cat_column_count = df[cat_column].value_counts()
    cat_column_count_df = pd.DataFrame(cat_column_count).reset_index()
    cat_column_count_df = cat_column_count_df.rename(columns={"index":␣
 ↪"categories"})
    plt.bar(cat_column_count_df.index, cat_column_count_df[cat_column])
    ax = plt.subplot()
    ax.set_xticks(range(len(cat_column_count_df)))
    ax.set_xticklabels(cat_column_count_df.categories, rotation = 90)
    plt.xlabel(str(cat_column).replace('_',' '))
    plt.ylabel("Counts")
    plt.show()


make_a_bar(roller_coasters, 'seating_type')
make_a_bar(roller_coasters, 'material_type')
```

	index	seating_type
0	Sit Down	2217
1	Spinning	150
2	Inverted	122
3	Suspended	55
4	Alpine	43
5	na	40
6	Water Coaster	29
7	Floorless	27
8	Flying	27
9	Motorbike	21
10	Stand Up	20
11	4th Dimension	18
12	Wing	17
13	Bobsleigh	11
14	Pipeline	5




2000
1750
1500
1250
1000
750
500
250
0
Counts
Steel
na
Wooden
Hybrid
material type