

Week 2: Brandon Mather DSC550-T301

```
In [2]: import matplotlib as mpl
import matplotlib.pyplot as plt
import numpy as np
import pandas as pd

In [3]: #Downloading CSV
data = pd.read_html('https://www.pro-football-reference.com/years/2022/fantasy-points-

In [4]: data.columns = data.columns.droplevel()

In [5]: data = data.drop(['FantPt', 'DKPt', 'FDPt'], axis=1)

In [6]: data.columns = ['Team', 'Games', 'Passing Completions', 'Passing Attempts', 'Passing Yards',
                        'Interceptions', 'Two Point Conversions', 'Sacks', 'Rushing Attempts'

In [7]: data.fillna(0)
```

Out[7]:

	Team	Games	Passing Completions	Passing Attempts	Passing Yards Allowed	Passing Touchdowns	Interceptions	Two Point Conversions
0	Detroit Lions	17	353	560	4446	26	12	2.0
1	Miami Dolphins	17	415	623	4259	27	8	2.0
2	Kansas City Chiefs	17	407	617	4138	33	11	1.0
3	Tennessee Titans	17	438	669	4931	29	14	2.0
4	Las Vegas Raiders	17	398	589	4319	25	6	2.0
5	Chicago Bears	17	322	479	3817	22	14	3.0
6	Minnesota Vikings	17	408	616	4756	23	15	2.0
7	Indianapolis Colts	17	365	535	3836	25	10	4.0
8	Jacksonville Jaguars	17	385	601	4258	25	14	3.0
9	Arizona Cardinals	17	412	591	4133	29	11	1.0
10	Carolina Panthers	17	383	580	4098	25	10	1.0
11	Atlanta Falcons	17	370	559	4010	25	10	2.0
12	New England Patriots	17	363	595	4018	28	19	1.0
13	Washington Commanders	17	308	514	3531	26	9	0.0
14	Tampa Bay Buccaneers	17	362	568	3767	29	10	2.0
15	Pittsburgh Steelers	17	331	540	4064	28	20	1.0
16	New York Giants	17	349	567	3909	21	6	0.0
17	Seattle Seahawks	17	341	544	3863	22	13	1.0
18	Baltimore Ravens	17	393	592	4239	20	14	1.0
19	Los Angeles Chargers	17	310	505	3693	24	14	1.0
20	New Orleans Saints	17	321	535	3400	17	7	1.0

	Team	Games	Passing Completions	Passing Attempts	Passing Yards Allowed	Passing Touchdowns	Interceptions	Two Point Conversions
21	Dallas Cowboys	17	344	548	3755	23	16	1.0
22	Los Angeles Rams	17	373	552	4044	22	16	1.0
23	New York Jets	17	347	556	3526	15	12	0.0
24	Green Bay Packers	17	312	476	3549	21	17	0.0
25	Denver Broncos	17	392	604	3819	20	14	1.0
26	Philadelphia Eagles	17	346	552	3519	21	17	1.0
27	San Francisco 49ers	17	389	591	4096	20	19	0.0
28	Cleveland Browns	17	314	518	3530	20	11	1.0
29	Houston Texans	17	336	522	3775	15	16	1.0
30	Cincinnati Bengals	16	327	554	3812	17	12	0.0
31	Buffalo Bills	16	362	570	3721	21	17	0.0

1) Using a data set of your choice, write an introduction explaining the data set.

This data is NFL team defensive stats from the 2022 NFL season. It contains the stats for each team on how well they did on defense vs QB's, including both passing and rushing stats against them, but also interceptions and sacks.

2) Identify a question or question(s) that you would like to explore in your data set.

The question I would like to explore is what affect Interceptions and Sacks have on the QB, weather it will make them pass/run better or worse.

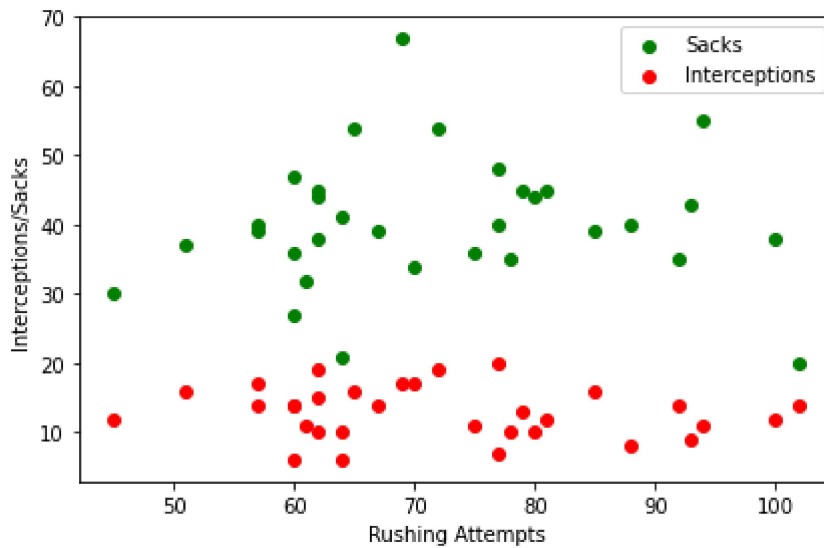
3) Create at least three graphs that help answer these questions. Make sure your graphs are clearly readable and are labeled appropriately and professionally.

```
In [52]: print("Interceptions/Sacks vs Rushing Attempts: ")
x=data["Rushing Attempts"]
y=data["Sacks"]
plt.scatter(x, y, c='green')

x=data["Rushing Attempts"]
y=data["Interceptions"]
plt.scatter(x, y, c='red')
```

```
plt.xlabel("Rushing Attempts")
plt.ylabel("Interceptions/Sacks")
plt.legend(["Sacks" , "Interceptions"])
plt.show()
```

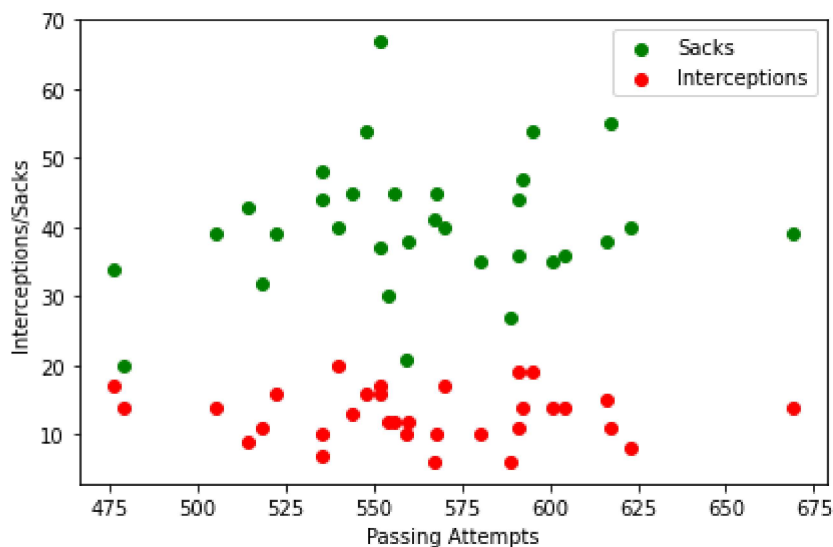
Interceptions/Sacks vs Rushing Attempts:



```
In [53]: print("Interceptions/Sacks vs Passing Attempts: ")
x=data["Passing Attempts"]
y=data["Sacks"]
plt.scatter(x, y, c='green')

x=data["Passing Attempts"]
y=data["Interceptions"]
plt.scatter(x, y, c='red')
plt.xlabel("Passing Attempts")
plt.ylabel("Interceptions/Sacks")
plt.legend(["Sacks" , "Interceptions"])
plt.show()
```

Interceptions/Sacks vs Passing Attempts:

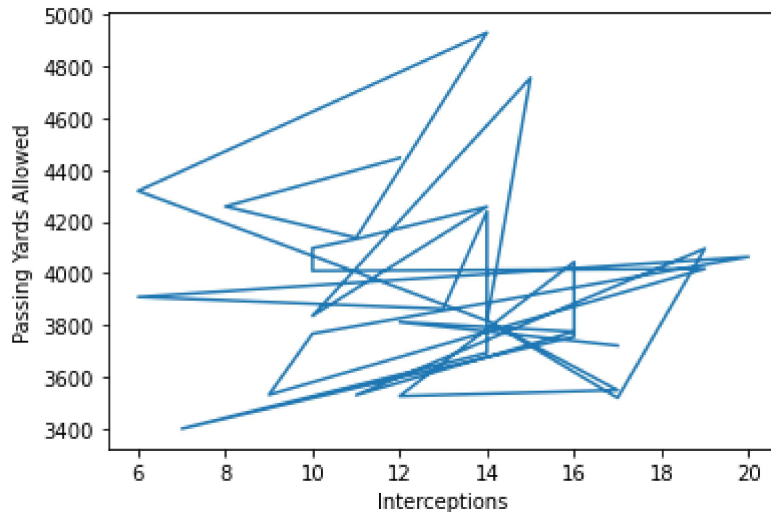


```
In [8]: x=data["Passing Yards Allowed"]
z=data["Rushing Yards Allowed"]
```

```
y=data["Interceptions"]
w=data["Sacks"]
```

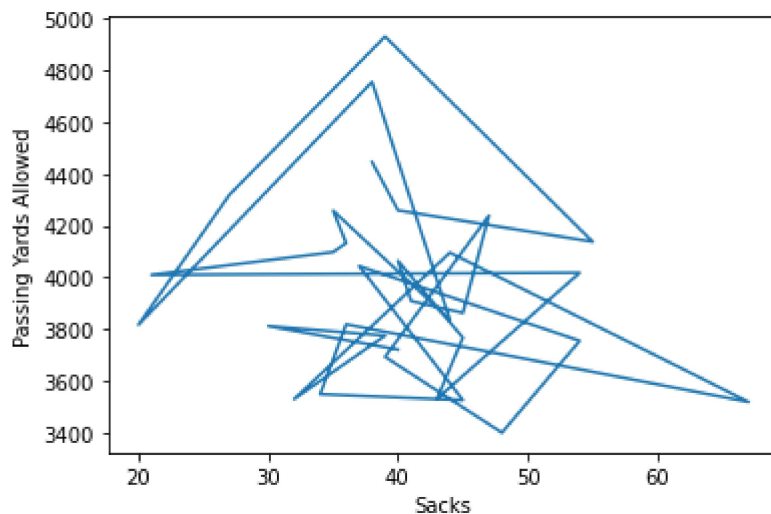
```
In [9]: print("Interceptions vs Passing Yards Allowed: ")
plt.plot(y, x)
plt.xlabel("Interceptions")
plt.ylabel("Passing Yards Allowed")
plt.show()
```

Interceptions vs Passing Yards Allowed:



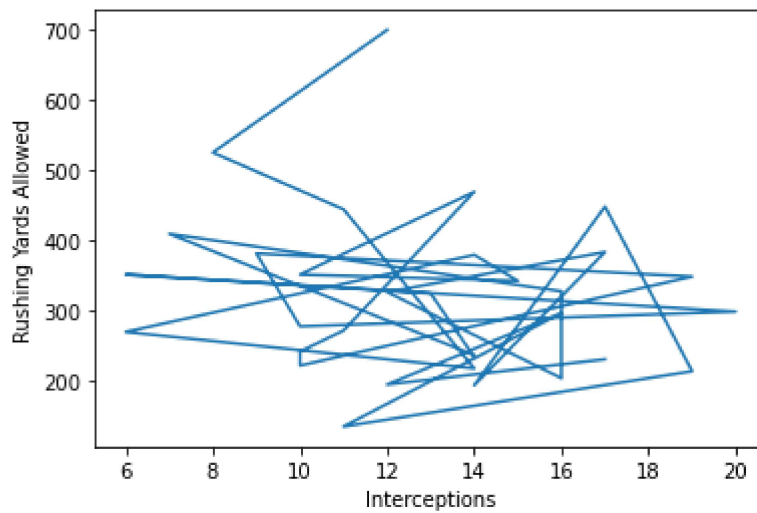
```
In [10]: print("Sacks vs Passing Yards Allowed: ")
plt.plot(w, x)
plt.xlabel("Sacks")
plt.ylabel("Passing Yards Allowed")
plt.show()
```

Sacks vs Passing Yards Allowed:



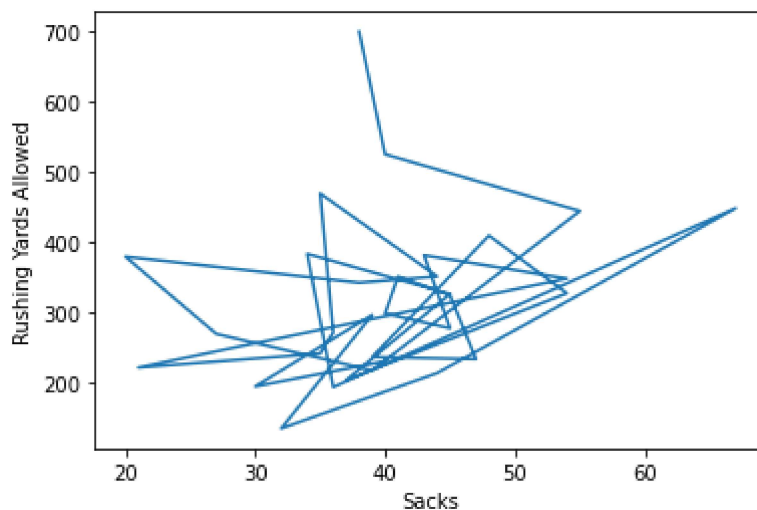
```
In [11]: print("Interceptions vs Rushing Yards Allowed: ")
plt.plot(y, z)
plt.xlabel("Interceptions")
plt.ylabel("Rushing Yards Allowed")
plt.show()
```

Interceptions vs Rushing Yards Allowed:



```
In [12]: print("Sacks vs Rushing Yards Allowed: ")
plt.plot(w, z)
plt.xlabel("Sacks")
plt.ylabel("Rushing Yards Allowed")
plt.show()
```

Sacks vs Rushing Yards Allowed:



4) Explain what you have learned from each of your graphs.

1st: This plot shows that the more Interceptions/Sacks a defense has the fewer running attempts the QB has. 2nd: This plot shows that Interceptions/Sacks don't have a major affect on passing attempts. 3rd: This plot shows the more interceptions a team has they tend to have allowed less passing yards. 4th: This plot shows that sacks don't have much of an impact on passing yads allowed except at the high end (after 50). 5th: This plot shows that interceptions don't have an affect on rushing yards allowed. 6th: This plot shows that higher sack rates can cause more rushing yards.

5) Write a conclusion that summarizes your findings.

What I found in my findings is that Interceptions and Sacks can have a negative affect on rushing yards by a QB and has a positive affect on passing yards by a QB. What with see with

running attempts and running yards is Interceptions seems to have a no real affect, but sacks has a negative affect. What this can actually tell us is if your defense gets to the QB aggressively they may need to worry about the QB scrambling and getting better yards, which can help with the coaching of the Defensive line and Linebackers about containing the QB. When it comes to passing attempts and passing yards, interceptions and sacks have much more of an impact. Having good pressure could be causing more interceptions, which in turn causes less yards. Having more sacks affects the amount of passing attempts more than a team having more interceptions. So in conclusion you want your team to have more sacks and interceptions but needs to make sure they are keeping the QB from scrambling in order to have success. You then could take individual stats from QB's to see which are the most dangerous at running the ball, which would change how you call plays.

In []: