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

In [3]:
```
laliga = pd.read_csv('C:/Users/ap983/Desktop/P. SERVER/3.GREAT LEARNING/PENDING
laliga
```

Out[3]:

	Pos	Team	Seasons	Points	GamesPlayed	GamesWon	GamesDrawn	GamesLost	Goals
0	1	Real Madrid	86	4385	2762	1647	552	563	5
1	2	Barcelona	86	4262	2762	1581	573	608	5
2	3	Atletico Madrid	80	3442	2614	1241	598	775	4
3	4	Valencia	82	3386	2664	1187	616	861	4
4	5	Athletic Bilbao	86	3368	2762	1209	633	920	4
...	...	...	...	...	...	...	...	...	
56	57	Xerez	1	34	38	8	10	20	
57	58	Condal	1	22	30	7	8	15	
58	59	Atletico Tetuan	1	19	30	7	5	18	
59	60	Cultural Leonesa	1	14	30	5	4	21	
60	61	Girona	1	-	-	-	-	-	

61 rows × 20 columns

In [4]:
```
laliga.head()
```

Out[4]:

	Pos	Team	Seasons	Points	GamesPlayed	GamesWon	GamesDrawn	GamesLost	GoalsI
0	1	Real Madrid	86	4385	2762	1647	552	563	59
1	2	Barcelona	86	4262	2762	1581	573	608	59
2	3	Atletico Madrid	80	3442	2614	1241	598	775	45
3	4	Valencia	82	3386	2664	1187	616	861	43
4	5	Athletic Bilbao	86	3368	2762	1209	633	920	46

In [5]:
```
laliga.head()
```

Out[5]:

	Pos	Team	Seasons	Points	GamesPlayed	GamesWon	GamesDrawn	GamesLost	GoalsI
0	1	Real Madrid	86	4385	2762	1647	552	563	59
1	2	Barcelona	86	4262	2762	1581	573	608	59
2	3	Atletico Madrid	80	3442	2614	1241	598	775	45
3	4	Valencia	82	3386	2664	1187	616	861	43
4	5	Athletic Bilbao	86	3368	2762	1209	633	920	46

In [6]:
```
laliga.rename(columns={'team':'Pos'},inplace=False)
```

Out[6]:

	Pos	Team	Seasons	Points	GamesPlayed	GamesWon	GamesDrawn	GamesLost	Goals
0	1	Real Madrid	86	4385	2762	1647	552	563	5
1	2	Barcelona	86	4262	2762	1581	573	608	5
2	3	Atletico Madrid	80	3442	2614	1241	598	775	4
3	4	Valencia	82	3386	2664	1187	616	861	4
4	5	Athletic Bilbao	86	3368	2762	1209	633	920	4
...	...	...	...	...	...	...	...	...	
56	57	Xerez	1	34	38	8	10	20	
57	58	Condal	1	22	30	7	8	15	
58	59	Atletico Tetuan	1	19	30	7	5	18	
59	60	Cultural Leonesa	1	14	30	5	4	21	
60	61	Girona	1	-	-	-	-	-	

61 rows × 20 columns

In [7]:
```
laliga.tail()
```

Out[7]:

	Pos	Team	Seasons	Points	GamesPlayed	GamesWon	GamesDrawn	GamesLost	GoalsF
56	57	Xerez	1	34	38	8	10	20	
57	58	Condal	1	22	30	7	8	15	
58	59	Atletico Tetuan	1	19	30	7	5	18	
59	60	Cultural Leonesa	1	14	30	5	4	21	
60	61	Girona	1	-	-	-	-	-	

In [8]:
```
laliga.shape
```

Out[8]:
```
(61, 20)
```

In [9]:
```
laliga.columns
```

Out[9]:
```
Index(['Pos', 'Team', 'Seasons', 'Points', 'GamesPlayed', 'GamesWon',
       'GamesDrawn', 'GamesLost', 'GoalsFor', 'GoalsAgainst', 'Champion',
       'Runner-up', 'Third', 'Fourth', 'Fifth', 'Sixth', 'T', 'Debut',
       'Since/LastApp', 'BestPosition'],
      dtype='object')
```

In [10]:
```
laliga.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 61 entries, 0 to 60
Data columns (total 20 columns):
 #   Column         Non-Null Count  Dtype 
---  ------         --------------  ----- 
 0   Pos            61 non-null     int64 
 1   Team           61 non-null     object
 2   Seasons        61 non-null     int64 
 3   Points         61 non-null     object
 4   GamesPlayed    61 non-null     object
 5   GamesWon       61 non-null     object
 6   GamesDrawn     61 non-null     object
 7   GamesLost      61 non-null     object
 8   GoalsFor       61 non-null     object
 9   GoalsAgainst   61 non-null     object
 10  Champion       61 non-null     object
 11  Runner-up      61 non-null     object
 12  Third          61 non-null     object
 13  Fourth         61 non-null     object
 14  Fifth          61 non-null     object
 15  Sixth          61 non-null     object
 16  T              61 non-null     object
 17  Debut          61 non-null     object
 18  Since/LastApp  61 non-null     object
 19  BestPosition   61 non-null     int64 
dtypes: int64(3), object(17)
memory usage: 9.7+ KB
```

In [11]:
```
laliga.describe()
```

Out[11]:

	Pos	Seasons	BestPosition
count	61.000000	61.000000	61.000000
mean	31.000000	24.000000	7.081967
std	17.752934	26.827225	5.276663
min	1.000000	1.000000	1.000000
25%	16.000000	4.000000	3.000000
50%	31.000000	12.000000	6.000000
75%	46.000000	38.000000	10.000000
max	61.000000	86.000000	20.000000

In [12]:
```
laliga.isnull().sum()
```

Out[12]:
```
Pos             0
Team            0
Seasons         0
Points          0
GamesPlayed     0
GamesWon        0
GamesDrawn      0
GamesLost       0
GoalsFor        0
GoalsAgainst    0
Champion        0
Runner-up       0
Third           0
Fourth          0
Fifth           0
Sixth           0
T               0
Debut           0
Since/LastApp   0
BestPosition    0
dtype: int64
```

- Reading the data set and replace dashes with 0 to make sure you can perform arithmetic operations on the data

In [13]:
```
laliga.replace('-',np.nan,inplace = True)
laliga =laliga.fillna(0)
laliga
```

Out[13]:

	Pos	Team	Seasons	Points	GamesPlayed	GamesWon	GamesDrawn	GamesLost	Goals
0	1	Real Madrid	86	4385	2762	1647	552	563	5
1	2	Barcelona	86	4262	2762	1581	573	608	5
2	3	Atletico Madrid	80	3442	2614	1241	598	775	4
3	4	Valencia	82	3386	2664	1187	616	861	4
4	5	Athletic Bilbao	86	3368	2762	1209	633	920	4
...	...	...	...	...	...	...	...	...	
56	57	Xerez	1	34	38	8	10	20	
57	58	Condal	1	22	30	7	8	15	
58	59	Atletico Tetuan	1	19	30	7	5	18	
59	60	Cultural Leonesa	1	14	30	5	4	21	
60	61	Girona	1	0	0	0	0	0	

61 rows × 20 columns

- Print all the teams which have started playing between 1930-1980. (5 points)

In [14]:
```
laliga.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 61 entries, 0 to 60
Data columns (total 20 columns):
 #   Column         Non-Null Count  Dtype 
---  ------         --------------  ----- 
 0   Pos            61 non-null     int64 
 1   Team           61 non-null     object
 2   Seasons        61 non-null     int64 
 3   Points         61 non-null     object
 4   GamesPlayed    61 non-null     object
 5   GamesWon       61 non-null     object
 6   GamesDrawn     61 non-null     object
 7   GamesLost      61 non-null     object
 8   GoalsFor       61 non-null     object
 9   GoalsAgainst   61 non-null     object
 10  Champion       61 non-null     object
 11  Runner-up      61 non-null     object
 12  Third          61 non-null     object
 13  Fourth         61 non-null     object
 14  Fifth          61 non-null     object
 15  Sixth          61 non-null     object
 16  T              61 non-null     object
 17  Debut          61 non-null     object
 18  Since/LastApp  61 non-null     object
 19  BestPosition   61 non-null     int64 
dtypes: int64(3), object(17)
memory usage: 9.7+ KB
```

In [15]:
```
laliga['Debut'] = laliga['Debut'].astype(str).str[:4].astype(int)
laliga_new = laliga[laliga['Debut'].between(1930,1980)]
laliga_new
```

Out[15]:

	Pos	Team	Seasons	Points	GamesPlayed	GamesWon	GamesDrawn	GamesLost	Goa
3	4	Valencia	82	3386	2664	1187	616	861	
5	6	Sevilla	73	2819	2408	990	531	887	
8	9	Zaragoza	58	2109	1986	698	522	766	
9	10	Real Betis	51	1884	1728	606	440	682	
10	11	Deportivo La Coruna	45	1814	1530	563	392	575	
11	12	Celta Vigo	51	1789	1698	586	389	723	
12	13	Valladolid	42	1471	1466	463	384	619	
14	15	Sporting Gijon	43	1389	1458	471	358	629	
15	16	Osasuna	37	1351	1318	426	327	565	
16	17	Malaga	36	1314	1255	390	330	535	
17	18	Oviedo	38	1174	1192	408	292	492	
18	19	Mallorca	27	1148	988	333	256	399	
19	20	Las Palmas	33	1020	1096	367	242	487	
21	22	Granada	23	667	742	218	175	349	
22	23	Rayo Vallecano	17	662	652	189	148	305	
23	24	Elche	21	606	678	203	180	295	
25	26	Hercules	20	538	628	184	149	295	
26	27	Tenerife	13	510	494	155	128	211	
27	28	Murcia	18	445	586	145	143	298	
28	29	Alaves	12	421	380	125	81	174	
29	30	Levante	11	416	402	113	95	194	
30	31	Salamanca	12	375	423	123	102	198	
31	32	Sabadell	14	353	426	129	95	202	
32	33	Cadiz	12	343	448	104	127	217	
34	35	Castellon	11	285	334	103	79	152	
37	38	Cordoba	9	230	282	82	63	137	
39	40	Recreativo	5	188	186	50	46	90	
40	41	Burgos CF	6	168	204	59	50	95	
41	42	Pontevedra	6	150	180	53	44	83	
46	47	Gimnastic	4	91	116	34	16	66	
49	50	Alcoyano	4	76	108	30	16	62	
50	51	Jaen	3	71	90	29	13	48	
52	53	AD Almeria	2	52	68	17	18	33	

	Pos	Team	Seasons	Points	GamesPlayed	GamesWon	GamesDrawn	GamesLost	Goa
54	55	Lleida	2	40	68	13	14	41	
57	58	Condal	1	22	30	7	8	15	
58	59	Atletico Tetuan	1	19	30	7	5	18	
59	60	Cultural Leonesa	1	14	30	5	4	21	

- Print the list of teams which came Top 5 in terms of points (2.5 points)

In [16]:
```
laliga['Points'] = laliga.Points.astype(float)
laliga.sort_values(by=['Points'],ascending = False)
```

Out[16]:

	Pos	Team	Seasons	Points	GamesPlayed	GamesWon	GamesDrawn	GamesLost	Goals
0	1	Real Madrid	86	4385.0	2762	1647	552	563	5
1	2	Barcelona	86	4262.0	2762	1581	573	608	5
2	3	Atletico Madrid	80	3442.0	2614	1241	598	775	4
3	4	Valencia	82	3386.0	2664	1187	616	861	4
4	5	Athletic Bilbao	86	3368.0	2762	1209	633	920	4
...	...	...	...	...	...	...	...	...	
56	57	Xerez	1	34.0	38	8	10	20	
57	58	Condal	1	22.0	30	7	8	15	
58	59	Atletico Tetuan	1	19.0	30	7	5	18	
59	60	Cultural Leonesa	1	14.0	30	5	4	21	
60	61	Girona	1	0.0	0	0	0	0	

61 rows × 20 columns

- Write a function with name “Goal_diff_count” which should return all the teams with their Goal Differences. Using the same function, find the team which has maximum and minimum goal difference. (5 points

In [17]:
```
laliga.head(1)
```

Out[17]:

	Pos	Team	Seasons	Points	GamesPlayed	GamesWon	GamesDrawn	GamesLost	GoalsFor
0	1	Real Madrid	86	4385.0	2762	1647	552	563	5947

In [18]:
```
laliga.tail(1)
```

Out[18]:

	Pos	Team	Seasons	Points	GamesPlayed	GamesWon	GamesDrawn	GamesLost	GoalsFo
60	61	Girona	1	0.0	0	0	0	0	

- Create a new column with name “Winning Percent” and append it to the data set (5 points) Percentage of Winning = (GamesWon / GamesPlayed)*100 If there are any numerical error, replace it with 0% Print the top 5 teams which has the highest Winning percentage

In [19]:
```
laliga['GamesWon'] = laliga.GamesWon.astype(float)
laliga['GamesPlayed'] = laliga.GamesPlayed.astype(float)
laliga['WinningPercent'] = (laliga.iloc[:,5]/laliga.iloc[:,4])*100
laliga
```

Out[19]:

	Pos	Team	Seasons	Points	GamesPlayed	GamesWon	GamesDrawn	GamesLost	Goals
0	1	Real Madrid	86	4385.0	2762.0	1647.0	552	563	5
1	2	Barcelona	86	4262.0	2762.0	1581.0	573	608	5
2	3	Atletico Madrid	80	3442.0	2614.0	1241.0	598	775	4
3	4	Valencia	82	3386.0	2664.0	1187.0	616	861	4
4	5	Athletic Bilbao	86	3368.0	2762.0	1209.0	633	920	4
...	...	...	...	...	...	...	...	...	
56	57	Xerez	1	34.0	38.0	8.0	10	20	
57	58	Condal	1	22.0	30.0	7.0	8	15	
58	59	Atletico Tetuan	1	19.0	30.0	7.0	5	18	
59	60	Cultural Leonesa	1	14.0	30.0	5.0	4	21	
60	61	Girona	1	0.0	0.0	0.0	0	0	

61 rows × 21 columns

- 6. Group teams based on their “Best position” and print the sum of their points for all positions (10 points) Eg: Best Position Points
  - 1 25000
  - 2 7000

In [21]:
```
laliga.groupby([laliga.iloc[:,10]]).sum()
```

Out[21]:

Champion	Pos	Seasons	Points	GamesPlayed	GamesWon	Debut	BestPosition	WinningPer
0	1841	805	27054.0	27074.0	8654.0	102111	423	1478.698
1	27	169	6517.0	5666.0	2159.0	5807	3	112.979
10	3	80	3442.0	2614.0	1241.0	1929	1	47.475
2	8	70	2573.0	2302.0	864.0	1929	1	37.532
25	2	86	4262.0	2762.0	1581.0	1929	1	57.241
33	1	86	4385.0	2762.0	1647.0	1929	1	59.630
6	4	82	3386.0	2664.0	1187.0	1931	1	44.557
8	5	86	3368.0	2762.0	1209.0	1929	1	43.772

In [22]:
```
laliga.head(2)
```

Out[22]:

	Pos	Team	Seasons	Points	GamesPlayed	GamesWon	GamesDrawn	GamesLost	GoalsI
0	1	Real Madrid	86	4385.0	2762.0	1647.0	552	563	59
1	2	Barcelona	86	4262.0	2762.0	1581.0	573	608	59

2 rows × 21 columns

In [ ]:
```

```