DEV RANGERA CS-B5 · 1M AGO · 1 VIEW · PRIVATE

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notebook8965a39f11

Python · UCL 2021-22 | Players Data

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In [3]:
```
# This Python 3 environment comes with many helpful analytics libraries installed
# It is defined by the kaggle/python Docker image: https://github.com/kaggle/docker-python
# For example, here's several helpful packages to load

import numpy as np # linear algebra
import pandas as pd # data processing, CSV file I/O (e.g. pd.read_csv)

# Input data files are available in the read-only "../input/" directory
# For example, running this (by clicking run or pressing Shift+Enter) will list all files under the in
put directory

import os
for dirname, _, filenames in os.walk('/kaggle/input'):
    for filename in filenames:
        print(os.path.join(dirname, filename))

# You can write up to 20GB to the current directory (/kaggle/working/) that gets preserved as output w
hen you create a version using "Save & Run All"
# You can also write temporary files to /kaggle/temp/, but they won't be saved outside of the current
session
```

```
/kaggle/input/ucl-202122-uefa-champions-league/defending.csv
/kaggle/input/ucl-202122-uefa-champions-league/key_stats.csv
/kaggle/input/ucl-202122-uefa-champions-league/attacking.csv
/kaggle/input/ucl-202122-uefa-champions-league/goalkeeping.csv
/kaggle/input/ucl-202122-uefa-champions-league/disciplinary.csv
/kaggle/input/ucl-202122-uefa-champions-league/goals.csv
/kaggle/input/ucl-202122-uefa-champions-league/attempts.csv
/kaggle/input/ucl-202122-uefa-champions-league/distributon.csv
```

In [4]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
```

In [5]:
```
df = pd.read_csv('/kaggle/input/ucl-202122-uefa-champions-league/goalkeeping.csv')
```

In [6]:
```
df.head()
```

Out[6]:

	serial	player_name	club	position	saved	conceded	saved_penalties	cleansheets	punches made	match_played
0	1	Courtois	Real Madrid	Goalkeeper	61	14	1	5	4	13
1	2	Rulli	Villarreal	Goalkeeper	41	16	0	3	12	12
2	3	Vlachodimos	Benfica	Goalkeeper	38	17	1	5	5	10
3	4	Athanasiadis	Sheriff	Goalkeeper	29	8	0	1	2	5
4	5	Mignolet	Club Brugge	Goalkeeper	28	20	0	0	1	6

In [7]:
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 53 entries, 0 to 52
Data columns (total 10 columns):
 #   Column           Non-Null Count  Dtype
---  ------           --------------  -----
 0   serial           53 non-null     int64
 1   player_name      53 non-null     object
 2   club             53 non-null     object
 3   position         53 non-null     object
 4   saved            53 non-null     int64
 5   conceded         53 non-null     int64
 6   saved_penalties  53 non-null     int64
 7   cleansheets      53 non-null     int64
 8   punches made     53 non-null     int64
 9   match_played     53 non-null     int64
dtypes: int64(7), object(3)
memory usage: 4.3+ KB
```

In [8]:
```
df.describe
```

Out[8]:
```
<bound method NDFrame.describe of     serial       player_name             club    position  sa
ved  conceded  \
```

Table of Contents

0	1	Courtois	Real Madrid	Goalkeeper	61	14
1	2	Rulli	Villarreal	Goalkeeper	41	16
2	3	Vlachodimos	Benfica	Goalkeeper	38	17
3	4	Athanasiadis	Sheriff	Goalkeeper	29	8
4	5	Mignolet	Club Brugge	Goalkeeper	28	20
5	6	Oblak	Atlético	Goalkeeper	26	10
6	7	Musso	Atalanta	Goalkeeper	21	13
7	8	Ersin Destanoğlu	Beşiktaş	Goalkeeper	20	17
8	9	De Gea	Man. United	Goalkeeper	19	9
9	9	Dahlin	Malmö	Goalkeeper	19	8
10	11	Diogo Costa	Porto	Goalkeeper	18	11
11	11	Trubin	Shakhtar Donetsk	Goalkeeper	18	9
12	11	Casteels	Wolfsburg	Goalkeeper	18	8
13	11	Donnarumma	Paris	Goalkeeper	18	6
14	15	Adán	Sporting CP	Goalkeeper	17	13
15	16	Köhn	Salzburg	Goalkeeper	16	14
16	16	Ter Stegen	Barcelona	Goalkeeper	16	9
17	18	Alisson Becker	Liverpool	Goalkeeper	15	14
18	19	Ederson	Man. City	Goalkeeper	14	14
19	19	Kobel	Dortmund	Goalkeeper	14	11
20	19	Szczęsny	Juventus	Goalkeeper	14	10
21	19	Maignan	Milan	Goalkeeper	14	7
22	19	Neuer	Bayern	Goalkeeper	14	6
23	19	Bounou	Sevilla	Goalkeeper	14	5
24	25	Bushchan	Dynamo Kyiv	Goalkeeper	13	11
25	25	Pasveer	Ajax	Goalkeeper	13	6
26	25	Diawara	Malmö	Goalkeeper	13	6
27	25	Grbić	LOSC	Goalkeeper	13	4
28	29	Handanovič	Inter	Goalkeeper	12	7
29	29	Kritsyuk	Zenit	Goalkeeper	12	6
30	29	Faivre	Young Boys	Goalkeeper	12	6
31	32	Gulácsi	Leipzig	Goalkeeper	11	14
32	32	Navas	Paris	Goalkeeper	11	5
33	34	Mendy	Chelsea	Goalkeeper	9	7
34	34	Von Ballmoos	Young Boys	Goalkeeper	9	6
35	36	Tătărușanu	Milan	Goalkeeper	8	2
36	37	Celeadnic	Sheriff	Goalkeeper	6	3
37	38	M. Kerzhakov	Zenit	Goalkeeper	5	4
38	38	Pyatov	Shakhtar Donetsk	Goalkeeper	5	2
39	38	Pervan	Wolfsburg	Goalkeeper	5	2
40	41	Leo Jardim	LOSC	Goalkeeper	4	4
41	41	Kepa	Chelsea	Goalkeeper	4	3
42	41	Günok	Beşiktaş	Goalkeeper	4	2
43	41	Ulreich	Bayern	Goalkeeper	4	1
44	41	Boyko	Dynamo Kyiv	Goalkeeper	4	0
45	46	João Virginia	Sporting CP	Goalkeeper	3	4
46	46	Steffen	Man. City	Goalkeeper	3	2
47	46	Henderson	Man. United	Goalkeeper	3	1
48	46	Martínez	Leipzig	Goalkeeper	3	0
49	50	Onana	Ajax	Goalkeeper	2	2
50	50	Perin	Juventus	Goalkeeper	2	0
51	52	Shevchenko	Shakhtar Donetsk	Goalkeeper	1	1
52	52	Carson	Man. City	Goalkeeper	1	0

	saved_penalties	cleansheets	punches made	match_played
0	1	5	4	13
1	0	3	12	12
2	1	5	5	10
3	0	1	2	5
4	0	0	1	6
5	0	3	2	10
6	0	1	1	6
7	0	0	0	5
8	0	1	0	7
9	1	0	3	4
10	0	2	2	6
11	0	0	0	3
12	0	1	2	5
13	1	2	9	5
14	0	2	8	7
15	0	1	3	8
16	0	3	2	6
17	0	4	3	13
18	0	4	1	11
19	1	2	1	6
20	0	3	3	7
21	1	0	1	3
22	0	4	1	9
23	0	2	1	6
24	0	0	4	5
25	0	2	2	6
26	0	0	1	3
27	0	3	1	6
28	0	3	5	8
29	0	1	10	4
30	0	0	1	3
31	0	0	0	5
32	0	0	3	3
33	0	5	2	9
34	0	0	1	3
35	0	1	2	3
36	0	0	1	1
37	0	0	0	2
38	0	2	4	3
39	0	0	0	1
40	0	0	0	2
41	0	0	0	1
42	0	0	0	1
43	0	0	2	1
44	0	1	2	1
45	0	0	0	1
46	0	0	1	1
47	0	0	1	1
48	0	1	0	1
49	0	0	0	2
50	0	1	0	1

```
51          0          0          0          1
52          0          1          0          1  >
```

In [9]:
```
df['punches made'].mean()
```

Out[9]:
```
2.0754716981132075
```

In [10]:
```
df.isna().sum()
```

Out[10]:
```
serial            0
player_name       0
club              0
position          0
saved             0
conceded          0
saved_penalties   0
cleansheets       0
punches made      0
match_played      0
dtype: int64
```

In [11]:
```
df.sort_values('cleansheets')
```

Out[11]:

	serial	player_name	club	position	saved	conceded	saved_penalties	cleansheets	punches made	match_played
26	25	Diawara	Malmö	Goalkeeper	13	6	0	0	1	3
30	29	Faivre	Young Boys	Goalkeeper	12	6	0	0	1	3
24	25	Bushchan	Dynamo Kyiv	Goalkeeper	13	11	0	0	4	5
31	32	Gulácsi	Leipzig	Goalkeeper	11	14	0	0	0	5
32	32	Navas	Paris	Goalkeeper	11	5	0	0	3	3
21	19	Maignan	Milan	Goalkeeper	14	7	1	0	1	3
34	34	Von Ballmoos	Young Boys	Goalkeeper	9	6	0	0	1	3
36	37	Celeadnic	Sheriff	Goalkeeper	6	3	0	0	1	1
37	38	M. Kerzhakov	Zenit	Goalkeeper	5	4	0	0	0	2
39	38	Pervan	Wolfsburg	Goalkeeper	5	2	0	0	0	1
40	41	Leo Jardim	LOSC	Goalkeeper	4	4	0	0	0	2
41	41	Kepa	Chelsea	Goalkeeper	4	3	0	0	0	1
51	52	Shevchenko	Shakhtar Donetsk	Goalkeeper	1	1	0	0	0	1
42	41	Günok	Beşiktaş	Goalkeeper	4	2	0	0	0	1
11	11	Trubin	Shakhtar Donetsk	Goalkeeper	18	9	0	0	0	3
9	9	Dahlin	Malmö	Goalkeeper	19	8	1	0	3	4
45	46	João Virgínia	Sporting CP	Goalkeeper	3	4	0	0	0	1
7	8	Ersin Destanoğlu	Beşiktaş	Goalkeeper	20	17	0	0	0	5
46	46	Steffen	Man. City	Goalkeeper	3	2	0	0	1	1
47	46	Henderson	Man. United	Goalkeeper	3	1	0	0	1	1
4	5	Mignolet	Club Brugge	Goalkeeper	28	20	0	0	1	6
49	50	Onana	Ajax	Goalkeeper	2	2	0	0	0	2
43	41	Ulreich	Bayern	Goalkeeper	4	1	0	0	2	1
44	41	Boyko	Dynamo Kyiv	Goalkeeper	4	0	0	1	2	1
35	36	Tătăruşanu	Milan	Goalkeeper	8	2	0	1	2	3
48	46	Martínez	Leipzig	Goalkeeper	3	0	0	1	0	1
50	50	Perin	Juventus	Goalkeeper	2	0	0	1	0	1
29	29	Kritsyuk	Zenit	Goalkeeper	12	6	0	1	10	4
52	52	Carson	Man. City	Goalkeeper	1	0	0	1	0	1
15	16	Köhn	Salzburg	Goalkeeper	16	14	0	1	3	8
3	4	Athanasiadis	Sheriff	Goalkeeper	29	8	0	1	2	5
6	7	Musso	Atalanta	Goalkeeper	21	13	0	1	1	6
8	9	De Gea	Man. United	Goalkeeper	19	9	0	1	0	7
12	11	Casteels	Wolfsburg	Goalkeeper	18	8	0	1	2	5
25	25	Pasveer	Ajax	Goalkeeper	13	6	0	2	2	6
23	19	Bounou	Sevilla	Goalkeeper	14	5	0	2	1	6
19	19	Kobel	Dortmund	Goalkeeper	14	11	1	2	1	6
38	38	Pyatov	Shakhtar Donetsk	Goalkeeper	5	2	0	2	4	3
10	11	Diogo Costa	Porto	Goalkeeper	18	11	0	2	2	6
14	15	Adán	Sporting CP	Goalkeeper	17	13	0	2	8	7
13	11	Donnarumma	Paris	Goalkeeper	18	6	1	2	9	5
1	2	Rulli	Villarreal	Goalkeeper	41	16	0	3	12	12
5	6	Oblak	Atlético	Goalkeeper	26	10	0	3	2	10
27	25	Grbić	LOSC	Goalkeeper	13	4	0	3	1	6
16	16	Ter Stegen	Barcelona	Goalkeeper	16	9	0	3	2	6
20	19	Szczęsny	Juventus	Goalkeeper	14	10	0	3	3	7
28	29	Handanovič	Inter	Goalkeeper	12	7	0	3	5	8
17	18	Alisson Becker	Liverpool	Goalkeeper	15	14	0	4	3	13
18	19	Ederson	Man. City	Goalkeeper	14	14	0	4	1	11
22	19	Neuer	Bayern	Goalkeeper	14	6	0	4	1	9
33	34	Mendy	Chelsea	Goalkeeper	9	7	0	5	2	9
2	3	Vlachodimos	Benfica	Goalkeeper	38	17	1	5	5	10
0	1	Courtois	Real Madrid	Goalkeeper	61	14	1	5	4	13

In [12]:
```
df
```

Out[12]:

	serial	player_name	club	position	saved	conceded	saved_penalties	cleansheets	punches made	match_played
0	1	Courtois	Real Madrid	Goalkeeper	61	14	1	5	4	13
1	2	Rulli	Villarreal	Goalkeeper	41	16	0	3	12	12
2	3	Vlachodimos	Benfica	Goalkeeper	38	17	1	5	5	10
3	4	Athanasiadis	Sheriff	Goalkeeper	29	8	0	1	2	5
4	5	Mignolet	Club Brugge	Goalkeeper	28	20	0	0	1	6
5	6	Oblak	Atlético	Goalkeeper	26	10	0	3	2	10
6	7	Musso	Atalanta	Goalkeeper	21	13	0	1	1	6
7	8	Ersin [illegible]	Beşiktaş	Goalkeeper	20	17	0	0	0	5

8	9	De Gea	Man. United	Goalkeeper	19	9	0	1	0	7
9	9	Dahlin	Malmö	Goalkeeper	19	8	1	0	3	4
10	11	Diogo Costa	Porto	Goalkeeper	18	11	0	2	2	6
11	11	Trubin	Shakhtar Donetsk	Goalkeeper	18	9	0	0	0	3
12	11	Casteels	Wolfsburg	Goalkeeper	18	8	0	1	2	5
13	11	Donnarumma	Paris	Goalkeeper	18	6	1	2	9	5
14	15	Adán	Sporting CP	Goalkeeper	17	13	0	2	8	7
15	16	Köhn	Salzburg	Goalkeeper	16	14	0	1	3	8
16	16	Ter Stegen	Barcelona	Goalkeeper	16	9	0	3	2	6
17	18	Alisson Becker	Liverpool	Goalkeeper	15	14	0	4	3	13
18	19	Ederson	Man. City	Goalkeeper	14	14	0	4	1	11
19	19	Kobel	Dortmund	Goalkeeper	14	11	1	2	1	6
20	19	Szczęsny	Juventus	Goalkeeper	14	10	0	3	3	7
21	19	Maignan	Milan	Goalkeeper	14	7	1	0	1	3
22	19	Neuer	Bayern	Goalkeeper	14	6	0	4	1	9
23	19	Bounou	Sevilla	Goalkeeper	14	5	0	2	1	6
24	25	Bushchan	Dynamo Kyiv	Goalkeeper	13	11	0	0	4	5
25	25	Pasveer	Ajax	Goalkeeper	13	6	0	2	2	6
26	25	Diawara	Malmö	Goalkeeper	13	6	0	0	1	3
27	25	Grbić	LOSC	Goalkeeper	13	4	0	3	1	6
28	29	Handanovič	Inter	Goalkeeper	12	7	0	3	5	8
29	29	Kritsyuk	Zenit	Goalkeeper	12	6	0	1	10	4
30	29	Faivre	Young Boys	Goalkeeper	12	6	0	0	1	3
31	32	Gulácsi	Leipzig	Goalkeeper	11	14	0	0	0	5
32	32	Navas	Paris	Goalkeeper	11	5	0	0	3	3
33	34	Mendy	Chelsea	Goalkeeper	9	7	0	5	2	9
34	34	Von Ballmoos	Young Boys	Goalkeeper	9	6	0	0	1	3
35	36	Tătărușanu	Milan	Goalkeeper	8	2	0	1	2	3
36	37	Celeadnic	Sheriff	Goalkeeper	6	3	0	0	1	1
37	38	M. Kerzhakov	Zenit	Goalkeeper	5	4	0	0	0	2
38	38	Pyatov	Shakhtar Donetsk	Goalkeeper	5	2	0	2	4	3
39	38	Pervan	Wolfsburg	Goalkeeper	5	2	0	0	0	1
40	41	Leo Jardim	LOSC	Goalkeeper	4	4	0	0	0	2
41	41	Kepa	Chelsea	Goalkeeper	4	3	0	0	0	1
42	41	Günok	Beşiktaş	Goalkeeper	4	2	0	0	0	1
43	41	Ulreich	Bayern	Goalkeeper	4	1	0	0	2	1
44	41	Boyko	Dynamo Kyiv	Goalkeeper	4	0	0	1	2	1
45	46	João Virginia	Sporting CP	Goalkeeper	3	4	0	0	0	1
46	46	Steffen	Man. City	Goalkeeper	3	2	0	0	1	1
47	46	Henderson	Man. United	Goalkeeper	3	1	0	0	1	1
48	46	Martínez	Leipzig	Goalkeeper	3	0	0	1	0	1
49	50	Onana	Ajax	Goalkeeper	2	2	0	0	0	2
50	50	Perin	Juventus	Goalkeeper	2	0	0	1	0	1
51	52	Shevchenko	Shakhtar Donetsk	Goalkeeper	1	1	0	0	0	1
52	52	Carson	Man. City	Goalkeeper	1	0	0	1	0	1

In [13]:
```
df.columns
```

Out[13]:
```
Index(['serial', 'player_name', 'club', 'position', 'saved', 'conceded',
       'saved_penalties', 'cleansheets', 'punches made', 'match_played'],
      dtype='object')
```

In [14]:
```
df.sort_values('club')
```

Out[14]:

	serial	player_name	club	position	saved	conceded	saved_penalties	cleansheets	punches made	match_played
49	50	Onana	Ajax	Goalkeeper	2	2	0	0	0	2
25	25	Pasveer	Ajax	Goalkeeper	13	6	0	2	2	6
6	7	Musso	Atalanta	Goalkeeper	21	13	0	1	1	6
5	6	Oblak	Atlético	Goalkeeper	26	10	0	3	2	10
16	16	Ter Stegen	Barcelona	Goalkeeper	16	9	0	3	2	6
43	41	Ulreich	Bayern	Goalkeeper	4	1	0	0	2	1
22	19	Neuer	Bayern	Goalkeeper	14	6	0	4	1	9
2	3	Vlachodimos	Benfica	Goalkeeper	38	17	1	5	5	10
42	41	Günok	Beşiktaş	Goalkeeper	4	2	0	0	0	1
7	8	Ersin Destanoğlu	Beşiktaş	Goalkeeper	20	17	0	0	0	5
41	41	Kepa	Chelsea	Goalkeeper	4	3	0	0	0	1
33	34	Mendy	Chelsea	Goalkeeper	9	7	0	5	2	9
4	5	Mignolet	Club Brugge	Goalkeeper	28	20	0	0	1	6
19	19	Kobel	Dortmund	Goalkeeper	14	11	1	2	1	6
24	25	Bushchan	Dynamo Kyiv	Goalkeeper	13	11	0	0	4	5
44	41	Boyko	Dynamo Kyiv	Goalkeeper	4	0	0	1	2	1
28	29	Handanovič	Inter	Goalkeeper	12	7	0	3	5	8
20	19	Szczęsny	Juventus	Goalkeeper	14	10	0	3	3	7
50	50	Perin	Juventus	Goalkeeper	2	0	0	1	0	1
27	25	Grbić	LOSC	Goalkeeper	13	4	0	3	1	6
40	41	Leo Jardim	LOSC	Goalkeeper	4	4	0	0	0	2
31	32	Gulácsi	Leipzig	Goalkeeper	11	14	0	0	0	5
48	46	Martínez	Leipzig	Goalkeeper	3	0	0	1	0	1
17	18	Alisson Becker	Liverpool	Goalkeeper	15	14	0	4	3	13
9	9	Dahlin	Malmö	Goalkeeper	19	8	1	0	3	4
26	25	Diawara	Malmö	Goalkeeper	13	6	0	0	1	3
46	46	Steffen	Man. City	Goalkeeper	3	2	0	0	1	1
52	52	Carson	Man. City	Goalkeeper	1	0	0	1	0	1
18	19	Ederson	Man. City	Goalkeeper	14	14	0	4	1	11
8	9	De Gea	Man. United	Goalkeeper	19	9	0	1	0	7
47	46	Henderson	Man. United	Goalkeeper	3	1	0	0	1	1
21	19	Maignan	Milan	Goalkeeper	14	7	1	0	1	3
35	36	Tătărușanu	Milan	Goalkeeper	8	2	0	1	2	3
32	32	Navas	Paris	Goalkeeper	11	5	0	0	3	3
13	11	Donnarumma	Paris	Goalkeeper	18	6	1	2	9	5
10	11	Diogo Costa	Porto	Goalkeeper	18	11	0	2	2	6
0	1	Courtois	Real Madrid	Goalkeeper	61	14	1	5	4	13

15	16	Köhn	Salzburg	Goalkeeper	16	14	0	1	3	8
23	19	Bounou	Sevilla	Goalkeeper	14	5	0	2	1	6
38	38	Pyatov	Shakhtar Donetsk	Goalkeeper	5	2	0	2	4	3
51	52	Shevchenko	Shakhtar Donetsk	Goalkeeper	1	1	0	0	0	1
11	11	Trubin	Shakhtar Donetsk	Goalkeeper	18	9	0	0	0	3
36	37	Celeadnic	Sheriff	Goalkeeper	6	3	0	0	1	1
3	4	Athanasiadis	Sheriff	Goalkeeper	29	8	0	1	2	5
14	15	Adán	Sporting CP	Goalkeeper	17	13	0	2	8	7
45	46	João Virginia	Sporting CP	Goalkeeper	3	4	0	0	0	1
1	2	Rulli	Villarreal	Goalkeeper	41	16	0	3	12	12
39	38	Pervan	Wolfsburg	Goalkeeper	5	2	0	0	0	1
12	11	Casteels	Wolfsburg	Goalkeeper	18	8	0	1	2	5
34	34	Von Ballmoos	Young Boys	Goalkeeper	9	6	0	0	1	3
30	29	Faivre	Young Boys	Goalkeeper	12	6	0	0	1	3
29	29	Kritsyuk	Zenit	Goalkeeper	12	6	0	1	10	4
37	38	M. Kerzhakov	Zenit	Goalkeeper	5	4	0	0	0	2

In [15]:
```
gp = df.groupby(['club','saved'])
gp
```

Out[15]:
```
<pandas.core.groupby.generic.DataFrameGroupBy object at 0x7f1fa7663190>
```

In [16]:
```
df
```

Out[16]:

	serial	player_name	club	position	saved	conceded	saved_penalties	cleansheets	punches made	match_played
0	1	Courtois	Real Madrid	Goalkeeper	61	14	1	5	4	13
1	2	Rulli	Villarreal	Goalkeeper	41	16	0	3	12	12
2	3	Vlachodimos	Benfica	Goalkeeper	38	17	1	5	5	10
3	4	Athanasiadis	Sheriff	Goalkeeper	29	8	0	1	2	5
4	5	Mignolet	Club Brugge	Goalkeeper	28	20	0	0	1	6
5	6	Oblak	Atlético	Goalkeeper	26	10	0	3	2	10
6	7	Musso	Atalanta	Goalkeeper	21	13	0	1	1	6
7	8	Ersin Destanoğlu	Beşiktaş	Goalkeeper	20	17	0	0	0	5
8	9	De Gea	Man. United	Goalkeeper	19	9	0	1	0	7
9	9	Dahlin	Malmö	Goalkeeper	19	8	1	0	3	4
10	11	Diogo Costa	Porto	Goalkeeper	18	11	0	2	2	6
11	11	Trubin	Shakhtar Donetsk	Goalkeeper	18	9	0	0	0	3
12	11	Casteels	Wolfsburg	Goalkeeper	18	8	0	1	2	5
13	11	Donnarumma	Paris	Goalkeeper	18	6	1	2	9	5
14	15	Adán	Sporting CP	Goalkeeper	17	13	0	2	8	7
15	16	Köhn	Salzburg	Goalkeeper	16	14	0	1	3	8
16	16	Ter Stegen	Barcelona	Goalkeeper	16	9	0	3	2	6
17	18	Alisson Becker	Liverpool	Goalkeeper	15	14	0	4	3	13
18	19	Ederson	Man. City	Goalkeeper	14	14	0	4	1	11
19	19	Kobel	Dortmund	Goalkeeper	14	11	1	2	1	6
20	19	Szczęsny	Juventus	Goalkeeper	14	10	0	3	3	7
21	19	Maignan	Milan	Goalkeeper	14	7	1	0	1	3
22	19	Neuer	Bayern	Goalkeeper	14	6	0	4	1	9
23	19	Bounou	Sevilla	Goalkeeper	14	5	0	2	1	6
24	25	Bushchan	Dynamo Kyiv	Goalkeeper	13	11	0	0	4	5
25	25	Pasveer	Ajax	Goalkeeper	13	6	0	2	2	6
26	25	Diawara	Malmö	Goalkeeper	13	6	0	0	1	3
27	25	Grbić	LOSC	Goalkeeper	13	4	0	3	1	6
28	29	Handanovič	Inter	Goalkeeper	12	7	0	3	5	8
29	29	Kritsyuk	Zenit	Goalkeeper	12	6	0	1	10	4
30	29	Faivre	Young Boys	Goalkeeper	12	6	0	0	1	3
31	32	Gulácsi	Leipzig	Goalkeeper	11	14	0	0	0	5
32	32	Navas	Paris	Goalkeeper	11	5	0	0	3	3
33	34	Mendy	Chelsea	Goalkeeper	9	7	0	5	2	9
34	34	Von Ballmoos	Young Boys	Goalkeeper	9	6	0	0	1	3
35	36	Tătărușanu	Milan	Goalkeeper	8	2	0	1	2	3
36	37	Celeadnic	Sheriff	Goalkeeper	6	3	0	0	1	1
37	38	M. Kerzhakov	Zenit	Goalkeeper	5	4	0	0	0	2
38	38	Pyatov	Shakhtar Donetsk	Goalkeeper	5	2	0	2	4	3
39	38	Pervan	Wolfsburg	Goalkeeper	5	2	0	0	0	1
40	41	Leo Jardim	LOSC	Goalkeeper	4	4	0	0	0	2
41	41	Kepa	Chelsea	Goalkeeper	4	3	0	0	0	1
42	41	Günok	Beşiktaş	Goalkeeper	4	2	0	0	0	1
43	41	Ulreich	Bayern	Goalkeeper	4	1	0	0	2	1
44	41	Boyko	Dynamo Kyiv	Goalkeeper	4	0	0	1	2	1
45	46	João Virginia	Sporting CP	Goalkeeper	3	4	0	0	0	1
46	46	Steffen	Man. City	Goalkeeper	3	2	0	0	1	1
47	46	Henderson	Man. United	Goalkeeper	3	1	0	0	1	1
48	46	Martínez	Leipzig	Goalkeeper	3	0	0	1	0	1
49	50	Onana	Ajax	Goalkeeper	2	2	0	0	0	2
50	50	Perin	Juventus	Goalkeeper	2	0	0	1	0	1
51	52	Shevchenko	Shakhtar Donetsk	Goalkeeper	1	1	0	0	0	1
52	52	Carson	Man. City	Goalkeeper	1	0	0	1	0	1

In [17]:
```
df[(df['club'] == 'punches made') & (df['saved'] == 'back')]
```

Out[17]:

serial	player_name	club	position	saved	conceded	saved_penalties	cleansheets	punches made	match_played

In [18]:
```
c1 = df[df['club']=='inter']
```

In [19]:
```
c1
```

Out[19]:

	serial	player_name	club	position	saved	conceded	saved_penalties	cleansheets	punches made	match_played

Checking for NUll values

In [20]:
```
total_null = df.isnull().sum().sort_values(ascending = False)
percent = ((df.isnull().sum()/df.isnull().count())*100).sort_values(ascending = False)
print("Total records = ", df.shape[0])

missing_data = pd.concat([total_null,percent.round(2)],axis=1,keys=['Total Missing','In Percent'])
missing_data.head(10)
```

```
Total records =  53
```

Out[20]:

	Total Missing	In Percent
serial	0	0.0
player_name	0	0.0
club	0	0.0
position	0	0.0
saved	0	0.0
conceded	0	0.0
saved_penalties	0	0.0
cleansheets	0	0.0
punches made	0	0.0
match_played	0	0.0

From above observation No NULL valeus found¶

Data Visualization

Libraries

In [21]:
```
import seaborn as sns
import matplotlib.pyplot as plt

import warnings
warnings.filterwarnings('ignore')
```

In [22]:
```
df.describe(include = 'all')
```

Out[22]:

	serial	player_name	club	position	saved	conceded	saved_penalties	cleansheets	punches made	match_
count	53.000000	53	53	53	53.000000	53.000000	53.000000	53.000000	53.000000	53.000
unique	NaN	53	32	1	NaN	NaN	NaN	NaN	NaN	NaN
top	NaN	Courtois	Man. City	Goalkeeper	NaN	NaN	NaN	NaN	NaN	NaN
freq	NaN	1	3	53	NaN	NaN	NaN	NaN	NaN	NaN
mean	25.962264	NaN	NaN	NaN	13.528302	7.169811	0.113208	1.320755	2.075472	4.7735
std	15.197371	NaN	NaN	NaN	11.025502	5.158025	0.319878	1.541398	2.622749	3.3948
min	1.000000	NaN	NaN	NaN	1.000000	0.000000	0.000000	0.000000	0.000000	1.0000
25%	11.000000	NaN	NaN	NaN	5.000000	3.000000	0.000000	0.000000	0.000000	2.0000
50%	25.000000	NaN	NaN	NaN	13.000000	6.000000	0.000000	1.000000	1.000000	5.0000
75%	38.000000	NaN	NaN	NaN	18.000000	11.000000	0.000000	2.000000	3.000000	6.0000
max	52.000000	NaN	NaN	NaN	61.000000	20.000000	1.000000	5.000000	12.000000	13.000

In [23]:
```
df.isnull().sum()/len(df)*100
```

Out[23]:
```
serial            0.0
player_name       0.0
club              0.0
position          0.0
saved             0.0
conceded          0.0
saved_penalties   0.0
cleansheets       0.0
punches made      0.0
match_played      0.0
dtype: float64
```

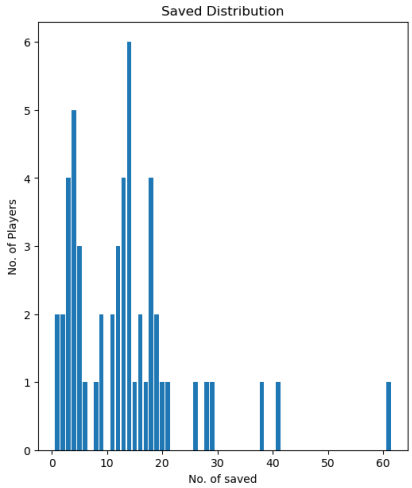
In [24]:
```
saved = df.groupby('saved')['saved'].count() # can be done using value counts
saved
```

Out[24]:
```
saved
1     2
2     2
3     4
4     5
5     3
6     1
8     1
9     2
11    2
```

```
12    3
13    4
14    6
15    1
16    2
17    1
18    4
19    2
20    1
21    1
26    1
28    1
29    1
38    1
41    1
61    1
Name: saved, dtype: int64
```

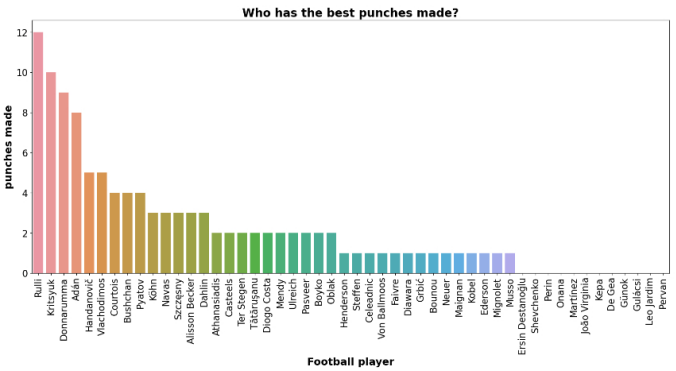
In [25]:

```
plt.figure(figsize=(6,7))
plt.bar(saved.index,saved.values)
plt.title("Saved Distribution")
plt.xlabel("No. of saved")
plt.ylabel("No. of Players")
plt.savefig('Distribution of saved variable.pdf', bbox_inches='tight')
plt.show()
```



In [26]:

```
plt.figure(figsize=(20, 8))
plt.title('Who has the best punches made?', fontsize=20, fontweight='bold')
plt.xticks(rotation=90, fontsize=16)
plt.yticks(fontsize=16)
sns.barplot(x=df.sort_values('punches made', ascending=False)[0:50]['player_name'],
            y=df.sort_values('punches made', ascending=False)[0:50]['punches made'])
plt.xlabel('Football player', fontsize=18, fontweight='bold')
plt.ylabel('punches made', fontsize=18, fontweight='bold')
plt.show()
```



In [27]:

```
clubs = df.groupby('club')['player_name'].count()
club_name = clubs.index
club_name
```

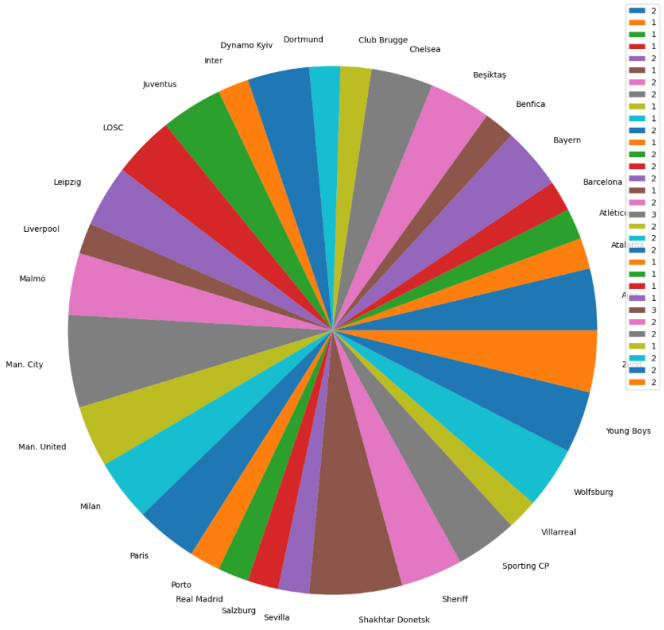
Out[27]:

```
Index(['Ajax', 'Atalanta', 'Atlético', 'Barcelona', 'Bayern', 'Benfica',
       'Beşiktaş', 'Chelsea', 'Club Brugge', 'Dortmund', 'Dynamo Kyiv',
       'Inter', 'Juventus', 'LOSC', 'Leipzig', 'Liverpool', 'Malmö',
       'Man. City', 'Man. United', 'Milan', 'Paris', 'Porto', 'Real Madrid',
       'Salzburg', 'Sevilla', 'Shakhtar Donetsk', 'Sheriff', 'Sporting CP',
       'Villarreal', 'Wolfsburg', 'Young Boys', 'Zenit'],
      dtype='object', name='club')
```

In [28]:

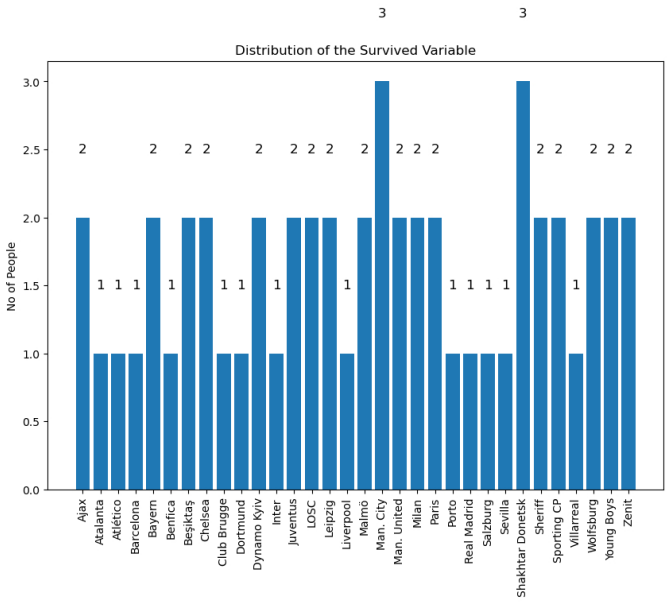
```
plt.figure(figsize=(20,15))
plt.pie(clubs,labels=club_name)
```

```
plt.legend(clubs.values)
plt.show()
```



In [29]:

```
plt.figure(figsize=(10,7))
plt.bar(clubs.index, clubs.values)
plt.title('Distribution of the Survived Variable')
plt.xticks(clubs.index,rotation=90)
plt.ylabel('No of People')
for i, value in enumerate(clubs.values):
    plt.text(i, value+0.5, str(value), fontsize=12, color='black', horizontalalignment='center',vert
icalalignment='center')
plt.savefig('Number of players in different clubs.pdf', bbox_inches='tight')
plt.show()
```



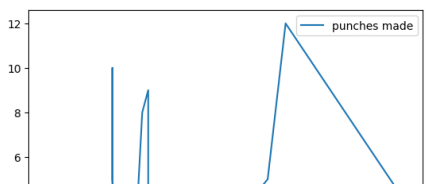
Saved Vs Punchesmade

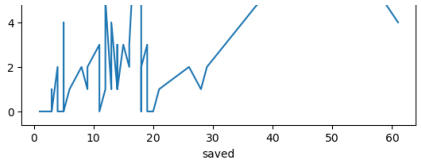
In [30]:

```
df.plot(kind='line', x='saved' , y= 'punches made')
```

Out[30]:

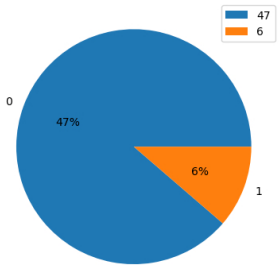
```
<AxesSubplot:xlabel='saved'>
```





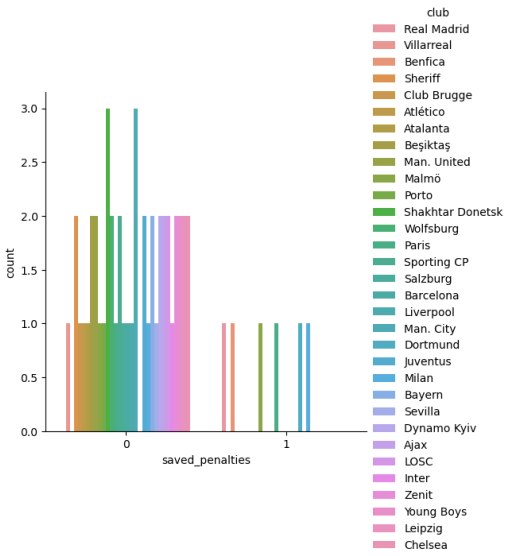
In [31]:
```
players_count = df.groupby('saved_penalties')['player_name'].count()
total = sum(players_count.values)
```

In [32]:
```
plt.pie(players_count.values, labels = players_count.index,autopct=lambda p: '{:.0f}%'.format(p * to
tal / 100))
plt.legend(players_count.values)
plt.show()
```



In [33]:
```
sns.catplot(x="saved_penalties",hue="club", kind="count", data=df)
```

Out[33]:
```
<seaborn.axisgrid.FacetGrid at 0x7f1fa7502110>
```

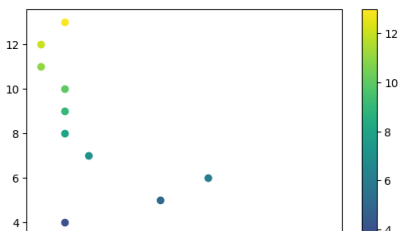


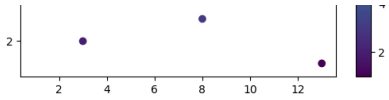
Mactch_played vs count

In [36]:
```
matches = df.groupby('match_played')['player_name'].count()
```

In [37]:
```
cnt = [1,2,3,4,5,6,7,8,9,10,11,12,13]
colors = np.array([1,2,3,4,5,6,7,8,9,10,11,12,13])
```

In [38]:
```
plt.scatter(matches,cnt, c = colors, cmap = 'viridis')
plt.colorbar()
plt.show()
```

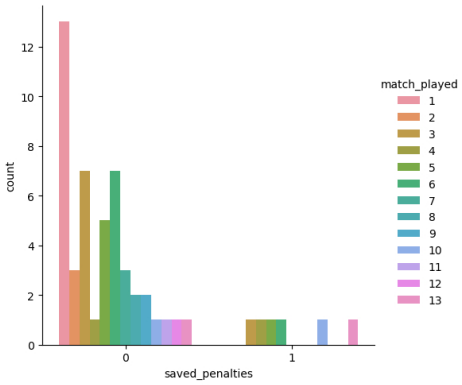




Match_played vs assists

In [41]:
```
sns.catplot(x="saved_penalties",hue="match_played", kind="count", data=df)
```

Out[41]:
```
<seaborn.axisgrid.FacetGrid at 0x7f1fa750a710>
```



Continue exploring

Data
1 input and 0 output →

Logs
17.7 second run - successful →

Comments
0 comments →