"Oeuvre-nalysis" Project - Phase 2

```
In []:
In [1]: import pandas as pd
        import numpy as np
In [2]: import matplotlib.pyplot as plt
        import seaborn as sns
        from adjustToyt import adjust toyt
In [3]: @mathlotlib inline
In []:
In [4]: plt.style.use(
                        'bmh',
'dark_background'
In [5]: sns.set_context(
                         'paper',
                         font_scale = 1.8
        fig av = nlt cubpletc()
         1.0
         8.0
         0.6
         0.4
         0.2
                                             0.8
                    0.2
                            0.4
                                    0.6
```

I OAD the "cleaned" data output from this

- 1. STANDARD_stats.csv
- 2. SHOOTING_stats.csv
- 3. GCA and SCA.csv
- 4. PASSING.csv
- 5. PASS_TYPES.csv
- 6. POSSESSION.csv
- 7. DEFENSIVE ACTIONS.csv

.

CSV (1): "STANDARD_stats"

```
In [6]: data_folder_path = ('~/SBNation_Articles_Soccer_Data/' +
                             'Player_Comparisons/ +
                             'Big_5_players_by_position/' +
                               'DATA_clean_grouped_by_position_20_21/'
                             'CLEAN_but_ungrouped_DATA/'
        data folder nath
Out[6]: '~/SBNation_Articles_Soccer_Data/Player_Comparisons/Big_5_players_by_
        position/CLEAN_but_ungrouped_DATA/'
In [7]: | file_path = (data_folder_path +
                      'STANDARD_stats.csv'
        file nath
Out[7]: '~/SBNation_Articles_Soccer_Data/Player_Comparisons/Big_5_players_by_
        position/CLEAN_but_ungrouped_DATA/STANDARD_stats.csv'
In [8]: CTANIDADD state - nd road coulfile math)
In [9]: CTANDADD ctate
Out [9]:
                 Player Nation
                              Pos
                                     Squad
                                              Comp Age
                                                          Born MP Starts
```

Player	Nation	Pos	Squad	Comp	Age	Born	MP	Starts	Min	•••	х
Ismael Aaneba	FRA	FWDF	Strasbourg	Ligue 1	21.0	1999.0	2	0	11		0
Patrick van Aanholt	NED	DF	Crystal Palace	Premier League	29.0	1990.0	22	20	1777		1
Issah Abbas	GHA	DFFW	Mainz 05	Bundesliga	21.0	1998.0	2	0	18		0
Yunis Abdelhamid	MAR	DF	Reims	Ligue 1	32.0	1987.0	33	33	2889		1
Sabit Abdulai	GHA	MF	Getafe	La Liga	21.0	1999.0	3	0	60		0
Steven Zuber	SUI	DFMF	Eint Frankfurt	Bundesliga	28.0	1991.0	20	6	585		0
Martín Zubimendi	ESP	MF	Real Sociedad	La Liga	21.0	1999.0	31	17	1882		0
Martin Ødegaard	NOR	MF	Arsenal	Premier League	21.0	1998.0	14	9	866		1
Martin Ødegaard	NOR	MFFW	Real Madrid	La Liga	21.0	1998.0	7	3	234		0
	Ismael Aaneba Patrick van Aanholt Issah Abbas Yunis Abdelhamid Sabit Abdulai Steven Zuber Martín Zubimendi Martin Ødegaard Martin	Ismael Aaneba FRA Patrick van Aanholt NED Issah Abbas GHA Yunis Abdelhamid MAR Sabit Abdulai GHA Steven Zuber SUI Martín Zubimendi ESP Martin Ødegaard NOR Martin NOR	Ismael Aaneba FRA FWDF Patrick van Aanholt NED DF Issah Abbas GHA DFFW Yunis Abdelhamid MAR DF Sabit Abdulai GHA MF Steven Zuber SUI DFMF Martin Zubimendi NOR MF Martin NOR MEFW	Ismael Aaneba FRA FWDF Strasbourg Patrick van Aanholt NED DF Crystal Palace Issah Abbas GHA DFFW Mainz 05 Yunis Abdelhamid MAR DF Reims Sabit Abdulai GHA MF Getafe Steven Zuber SUI DFMF Eint Frankfurt Martín Zubimendi PSP MF Real Sociedad Martin MOR MFFW Real Martin NOR MFFW Real	Ismael Aaneba FRA FWDF Strasbourg Ligue 1 Patrick van Aanholt NED DF Crystal Premier League Issah Abbas GHA DFFW Mainz 05 Bundesliga Yunis Abdelhamid MAR DF Reims Ligue 1 Sabit Abdulai GHA MF Getafe La Liga Steven Zuber SUI DFMF Frankfurt Frankfurt Martín Zubimendi NOR MF Arsenal Premier League Martin NOR MFFW Real La Liga	Ismael Aaneba FRA FWDF Strasbourg Ligue 1 21.0 Patrick van Aanholt NED DF Crystal Premier League 29.0 Issah Abbas GHA DFFW Mainz 05 Bundesliga 21.0 Yunis Abdelhamid MAR DF Reims Ligue 1 32.0 Sabit Abdulai GHA MF Getafe La Liga 21.0 Steven Zuber SUI DFMF Frankfurt Frankfurt Frankfurt Bundesliga 28.0 Martín Zubimendi NOR MF Arsenal Premier League 21.0 Martin NOR MEEW Real La Liga 21.0	Ismael Aaneba FRA FWDF Strasbourg Ligue 1 21.0 1999.0 Patrick van Aanholt NED DF Crystal Premier League 29.0 1990.0 Issah Abbas GHA DFFW Mainz 05 Bundesliga 21.0 1998.0 Yunis Abdelhamid MAR DF Reims Ligue 1 32.0 1987.0 Sabit Abdulai GHA MF Getafe La Liga 21.0 1999.0	Ismael Aaneba FRA FWDF Strasbourg Ligue 1 21.0 1999.0 2 Patrick van Aanholt NED DF Crystal Premier League 29.0 1990.0 22 Issah Abbas GHA DFFW Mainz 05 Bundesliga 21.0 1998.0 2 Yunis Abdelhamid MAR DF Reims Ligue 1 32.0 1987.0 33 Sabit Abdulai GHA MF Getafe La Liga 21.0 1999.0 3 Steven Zuber SUI DFMF Fint Frankfurt Bundesliga 28.0 1991.0 20 Martin Zubimendi ESP MF Real Sociedad La Liga 21.0 1998.0 7 Martin Martin NOR MFEW Real La Liga 21.0 1998.0 7	Ismael Aaneba FRA FWDF Strasbourg Ligue 1 21.0 1999.0 2 0 Patrick van Aanholt NED DF Crystal Palace Premier League 29.0 1990.0 22 20 Issah Abbas GHA DFFW Mainz 05 Bundesliga 21.0 1998.0 2 0 Abdelhamid MAR DF Reims Ligue 1 32.0 1987.0 33 33 Sabit Abdulai GHA MF Getafe La Liga 21.0 1999.0 3 0	Ismael Aaneba FRA FWDF Strasbourg Ligue 1 21.0 1999.0 2 0 11	Ismael Aaneba FRA FWDF Strasbourg Ligue 1 21.0 1999.0 2 0 11

FILTER out all players with LESS than 500 minutes played

In [11]: CTANDADD state of

Out[11]:

	Player	Nation	Pos	Squad	Comp	Age	Born	MP	Starts	Min	 хG
1	Patrick van Aanholt	NED	DF	Crystal Palace	Premier League	29.0	1990.0	22	20	1777	 1.2
3	Yunis Abdelhamid	MAR	DF	Reims	Ligue 1	32.0	1987.0	33	33	2889	 1.7
5	Mehdi Abeid	ALG	MF	Nantes	Ligue 1	27.0	1992.0	18	15	1320	 1.0
6	Laurent Abergel	FRA	MF	Lorient	Ligue 1	27.0	1993.0	38	32	2963	 1.3
7	Charles Abi	FRA	FWMF	Saint- Étienne	Ligue 1	20.0	2000.0	24	9	912	 2.1

	Player	Nation	Pos	Squad	Comp	Age	Born	MP	Starts	Min	 хG
2817	lgor Zubeldia	ESP	DF	Real Sociedad	La Liga	23.0	1997.0	24	21	1959	 1.0
2818	Steven Zuber	SUI	DFMF	Eint Frankfurt	Bundesliga	28.0	1991.0	20	6	585	 3.0
2819	Martín Zubimendi	ESP	MF	Real Sociedad	La Liga	21.0	1999.0	31	17	1882	 0.6
2820	Martin Ødegaard	NOR	MF	Arsenal	Premier League	21.0	1998.0	14	9	866	 1.1
0000	FIII D1317	000	K 40-0147	0	0! - 4	20.0	1000 0	00	^7	0070	

organize column variables into categories of related stats

```
In [12]: STANDARD_stats_COLUMNS = list(STANDARD_stats_df.columns
          CTANIDADD c+a+c COLLIMNIC
Out[12]: ['Player',
           'Nation',
           'Pos',
           'Squad',
           'Comp',
           'Age',
           'Born',
           'MP',
           'Starts',
           'Min',
           '90s',
           'Gls',
           'Ast',
           'G-PK',
           'PK',
           'PKatt',
           'CrdY',
           'CrdR',
           'Gls_per90',
           'Ast_per90',
           'G+A_per90',
           'G-PK_per90'
           'G+A-PK_per90',
           'xG',
           'npxG',
           'xA',
           'npxG+xA',
           'xG_per90',
           'xA_per90',
           'xG+xA_per90',
           'npxG_per90',
           'npxG+xA_per90',
           'Name_no_spec_chars']
```

```
In [13]: demographic_vars = ['Nation',
                              'Pos',
                              'Squad',
                              'Comp',
                              'Age',
                              'Born'
         demographic vare
Out[13]: ['Nation', 'Pos', 'Squad', 'Comp', 'Age', 'Born']
In [14]: playing_time_vars = ['MP',
                                'Starts',
                               'Min',
                               '90s'
         nlaving time vare
Out[14]: ['MP', 'Starts', 'Min', '90s']
In [15]: |goal_contribution_vars = ['Gls',
                                     'Ast'
                                     'G-PK'.
                                     'PK',
                                     'PKatt'
         anal contribution wars
Out[15]: ['Gls', 'Ast', 'G-PK', 'PK', 'PKatt']
In [16]: goal_contrib_vars_PER_90 = ['Gls_per90',
                                        'Ast_per90',
                                        'G+A_per90',
                                        'G-PK_per90',
                                        'G+A-PK_per90'
         goal contrib yars DED OA
Out[16]: ['Gls_per90', 'Ast_per90', 'G+A_per90', 'G-PK_per90', 'G+A-PK_per90']
In [17]: expected_goal_contrib_vars = ['xG',
                                         'npxG',
                                         'xA',
                                         'npxG+xA'
         expected anal contrib vare
Out[17]: ['xG', 'npxG', 'xA', 'npxG+xA']
In [18]: xG and xA vars PER 90 = ['xG per90'],
                                    'xA_per90',
                                    'xG+xA per90',
                                   'npxG_per90',
                                    'npxG+xA_per90'
         VC and VA Vare DED OA
Out[18]: ['xG_per90', 'xA_per90', 'xG+xA_per90', 'npxG_per90', 'npxG+xA_per90']
          ']
```

NOW organize ROWS into GROUPS:

...first by LEAGUE...

...and then by POSITION

Once all rows have already been sorted into their corresponding groups once, the results of this part can then be reused for each of the subsequent six CSV files remaining

```
In [ ]:
In [19]: LEAGUE_group_value_counts = (STANDARD_stats_df["Comp"]
                                         .value_counts()
                                         .reset_index(name = 'Distinct_Value_Count
                                         .rename(columns = {'index':'League_Name'}
                                           .sort_values('Distinct_Value_Counts')
                                        )
         LEAGUE_group_value_counts
Out[19]:
             League_Name Distinct_Value_Counts
          0
                  La Liga
                                       416
                  Serie A
                                       408
          2
                  Ligue 1
                                       399
            Premier League
                                       392
                Bundesliga
                                       347
 In [ ]:
 In [ ]:
 In [ ]:
In [20]: POSITION_group_value_counts = (STANDARD_stats_df["Pos"]
                                           .value counts()
                                           reset_index(name = 'Distinct_Value_Cou
                                           .rename(columns = {'index':'Position_Gr
```

POSITION_group_value_counts

```
Out[20]:
```

Out[20]:	Position_Group	Distinct_Value_Counts	
	0 DF	695	
	1 MF	395	
	2 FW	249	
	3 FWMF	200	
	4 MFFW	165	
	5 GK	132	
	6 DFMF	55	
	7 MFDF	45	
	8 DFFW	15	
	9 FWDF	11	
In []:			
T [04]			
In [21]:	multi_position	_groups_list = [FWMF',
			MFFW',
			DFMF',
		'	MFDF',
			DFFW',
		1	FWDF'
Out[21]:	[JEWME] IMEE		LDEEWI LEWDELL
out[21].	L CMMC , MCCM	, DEME , MEDE	', 'DFFW', 'FWDF']
In []:			
In []:			
			-
In [22]:	multi_POSITION	_players_df = STA	NDARD_stats_df[STANDARD_stats_df[
			"Pos"
			# <i>]</i> #
			#
].isin(
			1
			1
	multi_POSITION	_players_df	
Out [22]:			

Out[22]:

		Player	Nation	Pos	Squad	Comp	Age	Born	MP	Starts	Min	
	7	Charles Abi	FRA	FWMF	Saint- Étienne	Ligue 1	20.0	2000.0	24	9	912	
	18	Tyler Adams	USA	DFMF	RB Leipzig	Bundesliga	21.0	1999.0	27	21	1850	
	25	Martin Agirregabiria	ESP	DFMF	Alavés	La Liga	24.0	1996.0	26	16	1558	
	30	Sergio Agüero	ARG	FWMF	Manchester City	Premier League	32.0	1988.0	12	7	559	
	31	Ruben Aguilar	FRA	DFFW	Monaco	Ligue 1	27.0	1993.0	33	27	2225	
	2804	Arber Zeneli	KVX	MFFW	Reims	Ligue 1	25.0	1995.0	28	14	1289	
	2807	Mehdi Zerkane	ALG	MFFW	Bordeaux	Ligue 1	21.0	1999.0	27	15	1187	
	2813	Hakim Ziyech	MAR	FWMF	Chelsea	Premier League	27.0	1993.0	23	15	1172	
	2818	Steven Zuber	SUI	DFMF	Eint Frankfurt	Bundesliga	28.0	1991.0	20	6	585	
	2822	Filip Đuričić	SRB	MFFW	Sassuolo	Serie A	28.0	1992.0	32	27	2078	
	491 ro	ws × 33 colu	ımne									
In []:												
In []:												
In []:												
In []:												

NOTE TO SELF

.

FBref's methodology for producing their "scouting report pages" is explained at this link:

https://fbref.com/en/about/scouting-reports-explained#minutes (https://fbref.com/en/about/scouting-reports-explained#minutes)

.

That explanation included some important takeaways:

"Position Sets" Players are grouped into SIX different "position sets": **GOALKEEPERS CENTER BACKS FULLBACKS MIDFIELDERS** ATTACKING MIDS and WINGERS **FORWARDS** (...basically just for STRIKERS...???) In []: In []: In []:

FBref methodology - Takeaway (1)

"Comparison Pools"

.

Comparison pools are groups of players in each position set who are used when calculating percentiles.

.

To be included in a comparison pool, players need to reach a minimum number of minutes played at that position.

These minimums have been set to balance...

- ...the need to ensure that only players with an adequate amount of playing time are included...
- ...but also so that there are enough qualified players in the pool.

.

Specifically, for all of the Big Five leagues, the magic number currently for that "minimum" requirement...

...excludes any players who have NOT yet played at least 450 minutes

.

https://fbref.com/en/about/scouting-reports-explained#minutes (https://fbref.com/en/about/scouting-reports-explained#minutes)

.

Separating all Midfielders into four different categories...

- ...Defensive...
- ...Central...
- ...Attacking...
- ...and Wide...

...caused each resulting comparison pool to include too few players.

.

Instead, the people at FBref made the following important decisions:

.

the "position set" for "Midfielders" combines Defensive, Central and Wide Midfielders

.

a separate "position set" exists for Attacking Midfielders and Wingers

.

the "position set" for "Fullbacks" similarly includes Wingbacks

```
In [ ]:
In [23]: | messi_row_check = multi_POSITION_players_df[
                                                         multi_POSITION_players_df[
                                                        ]
         messi_row_check
Out[23]:
               Player Nation
                             Pos
                                    Squad Comp Age Born MP Starts Min ... xG npxG
                                             La 33.0 1987.0 35
               Lionel
                                                                 33 3023 ... 23.6 19.5
          1724
                       ARG FWMF Barcelona
                Messi
          1 rows × 33 columns
 In [ ]:
```

...apparently perfect SPELLING matters:

.

```
perisic_row
Out [24]:
           Player Nation Pos Squad Comp Age Born MP Starts Min ... xG npxG xA npxG+x
         0 rows × 33 columns
         ^ note how it failed without the correct "š" and
         also note that it did NOT produce an error
         message...
         ...instead returned empty DF with same columns but 0
         rows
In [25]: perisic_row = multi_POSITION_players_df[
                                                 multi_POSITION_players_df["Pla
                                                                          ] ==
                                                ]
         perisic_row
Out [25]:
              Player Nation
                           Pos Squad Comp Age Born MP Starts Min ... xG npxG xA
                Ivan
                                      Serie
                                          31.0 1989.0 32
                                                          20 1795 ... 4.4
          2065
                     CRO DFFW
                                Inter
              Perišić
         1 rows × 33 columns
 In [ ]:
 In [ ]:
 In [ ]:
 In [ ]: -
 In [ ]: -
In [26]: hybrid_position_counts_per_league = (
                                              multi_POSITION_players_df[
```

]

```
"Comp"
                                                      .value_counts()
                                                     .reset_index(
                                                                    name = 'Distinct_Val
                                                      . rename(
                                                               columns = {
                                                                            'index':'Leagu
          hybrid_position_counts_per_league
Out[26]:
              League Name Distinct Value Counts
           0
                 Bundesliga
                                          112
           1
                    La Liga
                                          110
                    Ligue 1
                                          109
             Premier League
                                           90
                    Serie A
                                           70
 In [ ]:
 In [ ]:
 In [ ]:
```

now FILTER out the 3 most important rows...

...for Eriksen, Luis Alberto, and Çalhanoğlu

In []:

In []:

```
] == "Christian Erik
                                            ]
          eriksen_row
Out [27]:
                Player Nation Pos Squad Comp Age
                                                    Born MP Starts
                                                                    Min ... xG npxG xA
                                         Serie 28.0 1992.0
               Christian
           821
                                                          26
                                                                17 1385 ... 1.7
                        DEN
                              MF
                                   Inter
                Eriksen
          1 rows × 33 columns
 In [ ]:
In [28]: alberto_row = STANDARD_stats_df[STANDARD_stats_df["Player"
                                                                l == "Luis Alberto"
                                            ]
Out [28]:
              Player Nation Pos Squad Comp Age
                                                  Born MP Starts Min ... xG npxG xA n
                                            27.0 1992.0 34
                                                              33 2618 ... 5.5
                       ESP
              Alberto
          1 rows × 33 columns
 In [ ]:
In [29]: calhanoglu_row = STANDARD_stats_df[
                                                 STANDARD_stats_df[
                                                                     "Player"
                                                                    ] == "Hakan Çalhan
                                                ]
          calhanoglu row
Out[29]:
                  Player Nation
                                 Pos Squad Comp Age
                                                       Born MP Starts
                  Hakan
                          TUR MFFW
                                      Milan
                                                  26.0
                                                     1994.0
                                                             33
                                                                   30 2614 ... 5.5
               Çalhanoğlu
          1 rows × 33 columns
 In []:
 In [ ]:
```

NOTE to self:

Eriksen and Alberto both simple, with "Pos" = "MF"

.

Initial Plan for Approaching Next Step:

.

start by just getting the averages/percentiles

...for each stat, only using rows listed as "MF"

.

the main point of this analysis is to get a sense of how well Çalhanoğlu can adjust to the deeper LCM role, as opposed to his usual "trequartista" CAM role

.

comparing his CAM stats to everyone else's ACTUAL midfielder stats should of course be taken with a grain of salt as a result...

...that being said, it's still the most logical way to at least start out

] == "H
)	
]	
MF_standard_stats_Big_5		

Out[31]:

	Player	Nation	Pos	Squad	Comp	Age	Born	MP	Starts	Min		хG	np
5	Mehdi Abeid	ALG	MF	Nantes	Ligue 1	27.0	1992.0	18	15	1320		1.0	
6	Laurent Abergel	FRA	MF	Lorient	Ligue 1	27.0	1993.0	38	32	2963		1.3	
22	Yacine Adli	FRA	MF	Bordeaux	Ligue 1	20.0	2000.0	35	25	2418		1.4	
26	Lucien Agoume	FRA	MF	Spezia	Serie A	18.0	2002.0	12	9	800		0.0	
33	Matteo Ahlinvi	BEN	MF	Nîmes	Ligue 1	21.0	1999.0	20	10	899		1.6	
2794	Andre- Frank Zambo Anguissa	CMR	MF	Fulham	Premier League	24.0	1995.0	36	29	2587		1.8	
2795 2809 2819	Niccolò Zanellato	ITA	MF	Crotone	Serie A	22.0	1998.0	27	18	1637		0.5	
	Piotr Zieliński	POL	MF	Napoli	Serie A	26.0	1994.0	36	32	2523		5.4	
	Martín Zubimendi	ESP	MF	Real Sociedad	La Liga	21.0	1999.0	31	17	1882		0.6	
2820	Martin Ødegaard	NOR	MF	Arsenal	Premier League	21.0	1998.0	14	9	866		1.1	
	6 22 26 33 2794 2795 2809 2819	Abeid Laurent Abergel Yacine Adli Lucien Agoume Lucien Agoume Matteo Ahlinvi Andre- Frank Zambo Anguissa Niccolò Zanellato Piotr Zieliński Martín Zubimendi Martin	Abeid ALG Abeid ALG Laurent Abergel FRA Yacine Adli FRA Lucien Agoume FRA Matteo Ahlinvi BEN Andre-Frank Zambo Anguissa Niccolò Zanellato ITA Piotr Zieliński POL Martín Zubimendi ESP Martin NOR	Abeid ALG MF Laurent Abergel FRA MF Yacine Adli FRA MF Lucien Agoume FRA MF Matteo Ahlinvi BEN MF Martin NOR ME	Abeid ALG MF Nantes Laurent Abergel FRA MF Lorient Yacine Adli FRA MF Bordeaux Lucien Agoume FRA MF Spezia Matteo Ahlinvi BEN MF Nîmes MAdre-Frank Zambo Anguissa Niccolò Zanellato ITA MF Crotone Real Sociedad Martin NOR ME Arsenal	Abeid ALG MF Nantes Ligue 1 Laurent Abergel FRA MF Lorient Ligue 1 Yacine Adli FRA MF Bordeaux Ligue 1 Lucien Agoume FRA MF Spezia Serie A Matteo Ahlinvi BEN MF Nîmes Ligue 1 Andre-Frank Zambo Anguissa Niccolò Zanellato ITA MF Crotone Serie A Martín Zubimendi BEN MF Napoli Serie A Premier Arsenal Premier	Abeid ALG MF Nantes Ligue 1 27.0 Laurent Abergel FRA MF Lorient Ligue 1 27.0 Yacine Adli FRA MF Bordeaux Ligue 1 20.0 Lucien Agoume FRA MF Spezia Serie A 18.0 Matteo Ahlinvi BEN MF Nîmes Ligue 1 21.0 Andre-Frank Zambo Anguissa Miccolò Zanellato ITA MF Crotone Serie A 22.0 Piotr Zieliński POL MF Napoli Serie A 26.0 Martin NOR MF Arsenal Premier 21.0 Martin NOR MF Arsenal Premier 21.0	5 Abeid ALG MF Nantes Ligue 1 27.0 1992.0 6 Laurent Abergel FRA MF Lorient Ligue 1 27.0 1993.0 22 Yacine Adli FRA MF Bordeaux Ligue 1 20.0 2000.0 26 Lucien Agoume FRA MF Spezia Serie A 18.0 2002.0 33 Matteo Ahlinvi BEN MF Nîmes Ligue 1 21.0 1999.0 34 Andre-Frank Zambo Anguissa CMR MF Fulham Fulham Premier League 24.0 1995.0 2795 Niccolò Zanellato ITA MF Crotone Serie A 22.0 1998.0 2809 Piotr Zieliński POL MF Napoli Serie A 26.0 1994.0 2819 Martín Zubimendi ESP MF Arsenal Premier 21.0 1999.0	5 Abeid ALG MF Nantes Ligue 1 27.0 1992.0 18 6 Laurent Abergel FRA MF Lorient Ligue 1 27.0 1993.0 38 22 Yacine Adli FRA MF Bordeaux Ligue 1 20.0 2000.0 35 26 Lucien Agoume FRA MF Spezia Serie A 18.0 2002.0 12 33 Matteo Allinvi BEN MF Nîmes Ligue 1 21.0 1999.0 20 <	Abeid ALG MF Nantes Ligue 1 27.0 1992.0 18 15 Abeid ALG MF Nantes Ligue 1 27.0 1992.0 18 15 Laurent Abergel FRA MF Lorient Ligue 1 27.0 1993.0 38 32 Yacine Adli FRA MF Bordeaux Ligue 1 20.0 2000.0 35 25 Lucien Agoume FRA MF Spezia Serie A 18.0 2002.0 12 9 33 Matteo Ahlinvi BEN MF Nîmes Ligue 1 21.0 1999.0 20 10	S Abeid ALG MF Nantes Ligue 1 27.0 1992.0 18 15 1320 6 Laurent Abergel FRA MF Lorient Ligue 1 27.0 1993.0 38 32 2963 22 Yacine Adli FRA MF Bordeaux Ligue 1 20.0 2000.0 35 25 2418 26 Lucien Agoume FRA MF Spezia Serie A 18.0 2002.0 12 9 800 33 Matteo Alinvi BEN MF Nîmes Ligue 1 21.0 1999.0 20 10 899 .	Abeid ALG MF Nantes Ligue 1 27.0 1992.0 18 15 1320 Laurent Abergel FRA MF Lorient Ligue 1 27.0 1993.0 38 32 2963 Yacine Adli FRA MF Bordeaux Ligue 1 20.0 2000.0 35 25 2418 Lucien Agoume FRA MF Spezia Serie A 18.0 2002.0 12 9 800 Matteo Ahlinvi BEN MF Nîmes Ligue 1 21.0 1999.0 20 10 899 Andre-Frank Zambo Anguissa CMR MF Fulham Premier League 24.0 1995.0 36 29 2587 CMR MF Fulham Premier League 24.0 1995.0 36 29 2587 Niccolò Zanellato ITA MF Crotone Serie A 22.0 1998.0 27 18 1637 Piotr Zieliński POL MF Napoli Serie A 26.0 1994.0 36 32 2523 Martín Martín Zubimendi ESP MF Real Sociedad La Liga 21.0 1999.0 31 17 1882	Abeid ALG MF Nantes Ligue 1 27.0 1992.0 18 15 1320 1.0 Laurent Abergel FRA MF Lorient Ligue 1 27.0 1993.0 38 32 2963 1.3 Yacine Adli FRA MF Bordeaux Ligue 1 20.0 2000.0 35 25 2418 1.4 Lucien Agoume FRA MF Spezia Serie A 18.0 2002.0 12 9 800 0.0 Matteo Ahlinvi BEN MF Nîmes Ligue 1 21.0 1999.0 20 10 899 1.6 MATÎN ARE COMR MF Fulham Premier League 24.0 1995.0 36 29 2587 1.8 Niccolò Zanellato ITA MF Crotone Serie A 22.0 1998.0 27 18 1637 0.5 Martín Zubimendi ESP MF Real Sociedad La Liga 21.0 1999.0 31 17 1882 0.6

In	Г	1.	
	-	٠.	
In	ſ	1:	

now create separate DF with RANKS and...

...PERCENTILES for each corresponding column

Tn	Г	1	
TII	L	1 6	

```
In [ ]:
In [32]: MF_big_5_std_NUMERICAL_stats = MF_standard_stats_Big_5.loc[:,
                                                                                   'Age' : 'np
           MF_big_5_std_NUMERICAL_stats
Out[32]:
                                                                             G+A-
                        Born MP Starts
                                               90s Gls Ast G-PK PK ...
                                         Min
                                                                                   xG npxG xA
                  Age
                                                                          PK per90
               5 27.0 1992.0
                              18
                                        1320
                                              14.7
                                                         0
                                                                0
                                                                              0.00 1.0
                                     15
                                                     0
                                                                    0 ...
                                                                                          1.0 0.8
               6 27.0 1993.0
                                        2963
                                              32.9
                                                                              0.12 1.3
                              38
                                     32
                                                     3
                                                                    0 ...
                                                                                         1.3 1.4
                20.0 2000.0
                                        2418 26.9
                              35
                                     25
                                                                              0.26 1.4
                                                                                         1.4 4.7
                 18.0 2002.0
                                          800
                                                                    0 ...
                                      9
                                               8.9
                                                     0
                                                         0
                                                                              0.00 0.0
                                                                                         0.0 0.1
                              12
                21.0 1999.0
                                                                2
              33
                              20
                                     10
                                          899 10.0
                                                     2
                                                         0
                                                                    0 ...
                                                                              0.20 1.6
                                                                                          1.6 0.3
                                                                               ...
                                                                                          ... ...
            2794 24.0 1995.0
                                        2587 28.7
                              36
                                                         3
                                                                    0 ...
                                                                              0.10 1.8
                                                                                         1.8 2.2
                                     29
                                                     0
            2795 22.0 1998.0
                              27
                                     18
                                        1637 18.2
                                                                    0 ...
                                                                              0.11 0.5
                                                                                         0.5 1.3
            2809
                 26.0 1994.0
                              36
                                        2523
                                             28.0
                                                         10
                                                                              0.64 5.4
                                                                                         5.4 5.4
            2819 21.0 1999.0
                              31
                                     17
                                         1882 20.9
                                                     0
                                                         0
                                                                    0 ...
                                                                              0.00 0.6
                                                                                         0.6 0.6
            2820 21.0 1998.0
                                          866
                                                         2
                                                                              0.31 1.1
                              14
                                               9.6
                                                     1
                                                                    0 ...
                                                                                         1.1 2.1
           396 rows × 27 columns
 In []:
In [33]: MF_big_5_std_NUMERICAL_stats.insert(
                                                       loc = 0,
                                                       column = 'Player',
                                                       value = MF_standard_stats_Big_5[
                                                                                             ]
                                                      )
           MF_big_5_std_NUMERICAL_stats
Out[33]:
                                                   Min 90s Gls Ast G-PK ... PK_per90
                                  Born MP Starts
                    Player Age
                     Mehdi
               5
                           27.0
                               1992.0
                                        18
                                               15 1320
                                                                          0 ...
                                                                                    0.00
                     Abeid
                    Laurent
                           27.0 1993.0
                                        38
                                               32 2963 32.9
                                                                          3 ...
               6
                                                               3
                                                                  1
                                                                                    0.12 1.3
                                                                                               1
                    Abergel
```

		Player	Age	Born	MP :	Starts	Min	90s	Gls	Ast	G-PK		G+A- PK_per90	vC	прэ
	22	Yacine Adli	20.0	2000.0	35	25	2418	26.9	2	5	2		0.26	1.4	1
	26	Lucien Agoume	18.0	2002.0	12	9	800	8.9	0	0	0		0.00	0.0	С
	33	Matteo Ahlinvi	21.0	1999.0	20	10	899	10.0	2	0	2		0.20	1.6	1
	2794	Andre- Frank Zambo Anguissa	24.0	1995.0	36	29	2587	28.7	0	3	0		0.10	1.8	1
	2795	Niccolò Zanellato	22.0	1998.0	27	18	1637	18.2	1	1	1		0.11	0.5	С
	2809	Piotr Zieliński	26.0	1994.0	36	32	2523	28.0	8	10	8		0.64	5.4	5
	2819	Martín Zubimendi	21.0	1999.0	31	17	1882	20.9	0	0	0		0.00	0.6	С
In []:															
In []:															
In [34]:	MF_bio	g_5_std_	_NUMEF	RICAL	_stats	s.set	_inde		Play	er'.					
										ce =	True	.			
	ME bid	n 5 c+d	NIIMET	OT CAL	c+ >+ /	_)	ip ca	-					
Out[34]:				,,,,,,											
		Age	Borr	n MP	Starts	Min	90s	Gls	Ast	G-PK	PK		G+A- PK_per90	хG	npx(
	Pla	ayer													
		ehdi peid 27.0	1992.0) 18	15	1320	14.7	0	0	0	0		0.00	1.0	1.
		rent rgel 27.0	1993.0	38	32	2963	32.9	3	1	3	0		0.12	1.3	1.3
		cine Adli ^{20.0}	2000.0	35	25	2418	26.9	2	5	2	0		0.26	1.4	1.
	Lu Agoı	cien ume 18.0	2002.0) 12	9	800	8.9	0	0	0	0		0.00	0.0	0.0
		tteo linvi 21.0	1999.0	20	10	899	10.0	2	0	2	0		0.20	1.6	1.0

```
Age
                                       Starts
                                                   90s Gls Ast G-PK PK ...
                                                                                         xG npx(
                                              Min
                                                                              PK per90
               Player
               Andre-
                Frank
                      24.0 1995.0
                                   36
                                                              3
                                                                         0 ...
                                          29 2587 28.7
                                                          0
                                                                     0
                                                                                   0.10 1.8
                                                                                              1.8
               Zambo
             Anguissa
              Niccolò
                      22.0 1998.0
                                   27
                                          18
                                             1637
                                                  18.2
                                                                         0
                                                                                   0.11 0.5
                                                                                              0.
             Zanellato
                 Piotr
                                                                                   0.64 5.4
                      26.0 1994.0
                                   36
                                          32 2523
                                                                    8
                                                                         0
                                                                                              5.
                                                  28.0
                                                          8
                                                             10
              Zieliński
 In [ ]:
 In []:
In [35]:
          # MF_in_Big_5_std_stat_RANKS = (
                                                 MF_standard_stats_Big_5.
           MF_in_Big_5_std_stat_RANKS = (MF_big_5_std_NUMERICAL_stats.
                                               rank(ascending = 0,
                                                                    0 = False
           #
                                                     method = 'min'
                                                                          #,
                                                        pct = True
                                                    )
                                                .astype(int)
           MF in Ria 5 ctd ctat DANKC
Out[35]:
                      Age Born MP Starts Min 90s Gls Ast G-PK PK ...
                                                                                       xG npxG
                                                                            PK per90
               Player
               Mehdi
                       139
                            251
                                 331
                                        269
                                            276
                                                 273
                                                      250
                                                          259
                                                                 239
                                                                      43
                                                                                 319 223
                                                                                            212
                Abeid
              Laurent
                       139
                            225
                                   1
                                         39
                                             21
                                                  20
                                                       63
                                                          164
                                                                  48
                                                                      43
                                                                                 191 176
                                                                                            166
              Abergel
               Yacine
                       366
                             19
                                  36
                                        134
                                             98
                                                  98
                                                       99
                                                           28
                                                                 88
                                                                      43
                                                                                     162
                                                                                            154
                 Adli
```

Lucien

Matteo

Ahlinvi

Agoume

385

346

383

317

28

347

340

359

346

359

346

250

99

259

259

239

88

43

43

319

108

393

141

392

130

```
Age Born MP Starts Min 90s Gls Ast G-PK PK ...
                                                                                  xG npxG
                                                                        PK_per90
              Player
              Andre-
               Frank
                                          71
                     240
                                19
                                      76
                                               71 250
                                                        59
                                                             239
                                                                 43 ...
                                                                             211 126
                           145
                                                                                       111
              Zambo
            Anguissa
             Niccolò
                     310
                            48 204
                                     225 224 224 150 164
                                                             141
                                                                 43 ...
                                                                             202 301
                                                                                       295
            Zanellato
                Piotr
                     169
                                                                                  22
                           180
                                19
                                      39
                                           87
                                               87
                                                    12
                                                               8
                                                                 43 ...
                                                                                        12
             Zieliński
              Martín
                     346
                            28 127
                                     238
                                         184 184 250 259
                                                             239
                                                                 43 ...
                                                                             319 287
                                                                                       281
 In []:
 In []:
 In []:
 In [ ]:
In [36]: MF_big_5_std_stat_PERCENTILES = (MF_big_5_std_NUMERICAL_stats.
                                                rank(ascending = 1,
          #
                                                                0 = False
                                                      method = 'min',
                                                      pct = True
                                                   .astype(int)
          ME hig 5 ctd ctat DEDCENTILEC
Out[36]:
                                          MP
                                                 Starts
                                                           Min
                                                                   90s
                         Age
                                Born
                                                                            Gls
                                                                                    Ast
```

	· ·								
Player									
Mehdi Abeid	0.578283	0.308081	0.141414	0.275253	0.305556	0.305556	0.002525	0.002525	0.0
Laurent Abergel	0.578283	0.371212	0.982323	0.863636	0.949495	0.949495	0.755051	0.351010	0.7
Yacine Adli	0.050505	0.934343	0.863636	0.623737	0.755051	0.755051	0.626263	0.896465	0.6
Lucien Agoume	0.022727	0.977273	0.022727	0.103535	0.093434	0.093434	0.002525	0.002525	0.0
Matteo Ahlinvi	0.080808	0.883838	0.186869	0.128788	0.126263	0.126263	0.626263	0.002525	0.6

				Age	Born	MP	Starts	Min	90s	Gls	Ast	
			Player									
			Andre- Frank Zambo Anguissa	0.323232	0.550505	0.914141	0.770202	0.823232	0.815657	0.002525	0.752525	0.0
			Niccolò Zanellato	0.131313	0.810606	0.431818	0.404040	0.436869	0.436869	0.373737	0.351010	0.4
			Piotr Zieliński	0.484848	0.436869	0.914141	0.863636	0.782828	0.777778	0.959596	0.987374	9.0
			Martín Zubimendi	0.080808	0.883838	0.641414	0.343434	0.537879	0.537879	0.002525	0.002525	0.0
In	[1:										
In	[1:										
In	[1:										

now extract two sub-DF's --> 3 rows each

.

...to see the RANKS first and then the...

.

...PERCENTILES in each column variable...

.

...for Eriksen, Alberto, and Çalhanoğlu

```
In []:
```

first get their RANKS from...

"MF_in_Big_5_std_stat_RANKS"

```
In [38]: # playmaking_artist_RANKS = MF_in_Big_5_std_stat_RANKS[MF_in_Big_5_std
#
#
#
# playmaking_artist_RANKS
```

NOTE to self:

.

the ABOVE code chunk did NOT work, because the...

... "Player" column was set to be the INDEX now

.

the BELOW code chunk actually DID work

.

...however, I wanted to try reformatting in a separate cell in order to make it...

...more readable, but without the risk of messing up what had actually worked

.

Out[40]:	playmakin	g_ar	tist_	RANK	(S									
		Age	Born	MP	Starts	Min	90s	Gls	Ast	G-PK	PK	 G+A- PK_per90	хG	npxG
	Player													
	Luis Alberto	139	251	56	28	65	64	8	100	4	43	 30	20	13
	Hakan Çalhanoğlu	169	180	75	66	68	68	46	7	48	24	 27	20	17
	Christian Eriksen	109	251	227	238	264	264	63	259	48	43	 113	132	119
	3 rows × 27	colun	nns											
In []:														
In []:														
In []:														
								_	.					

then get the PERCENTILES from... "MF_big_5_std_stat_PERCENTILES"

		Age	Born	MP	Starts	Min	90s	Gls	Ast	
	Player									
_	Luis Alberto	0.578283	0.308081	0.815657	0.906566	0.838384	0.833333	0.974747	0.590909	0.
	Hakan Çalhanoğlu	0.484848	0.436869	0.747475	0.813131	0.830808	0.828283	0.845960	0.972222	0.
	Christian Eriksen	0.654040	0.308081	0.404040	0.343434	0.335859	0.335859	0.755051	0.002525	0.

In	[1:	
In	[1:	
In	ſ	1:	

now TRANSPOSE both mini-DataFrames

.

In []:	
In []:	
In []:	
In [42]:	<pre>RANKS_transposed = playmaking_artist_RANKS.transpose()</pre>
0 . [40]	DANKS transposed

Out[42]:

Player	Luis Alberto	Hakan Çalhanoğlu	Christian Eriksen
Age	139	169	109
Born	251	180	251
MP	56	75	227
Starts	28	66	238
Min	65	68	264
90s	64	68	264
Gls	8	46	63
Ast	100	7	259
G-PK	4	48	48
PK	43	24	43
PKatt	47	29	47
CrdY	142	199	346
CrdR	71	71	71
Gls_per90	14	84	47
Ast_per90	165	13	259
G+A_per90	39	29	123
G-PK_per90	7	102	35
G+A-PK_per90	30	27	113

Player	Luis Alberto	Hakan Çalhanoğlu	Christian Eriksen
хG	20	20	132
npxG	13	17	119
хА	6	5	79
npxG+xA	8	8	100
xG_per90	35	35	98
xA_per90	8	5	40
xG+xA_per90	10	9	64

In []:

In []:

In []:

In [43]: PERCENTILES_transposed = playmaking_artist_PERCENTILES.transpose()

DEDCENTTI EC +ranchacad

Out[43]:

Player	Luis Alberto	Hakan Çalhanoğlu	Christian Eriksen
Age	0.578283	0.484848	0.654040
Born	0.308081	0.436869	0.308081
MP	0.815657	0.747475	0.404040
Starts	0.906566	0.813131	0.343434
Min	0.838384	0.830808	0.335859
90s	0.833333	0.828283	0.335859
Gls	0.974747	0.845960	0.755051
Ast	0.590909	0.972222	0.002525
G-PK	0.984848	0.782828	0.782828
PK	0.002525	0.896465	0.002525
PKatt	0.002525	0.886364	0.002525
CrdY	0.502525	0.363636	0.050505
CrdR	0.002525	0.002525	0.002525
Gls_per90	0.964646	0.777778	0.871212
Ast_per90	0.535354	0.967172	0.002525
G+A_per90	0.898990	0.921717	0.666667
G-PK_per90	0.984848	0.709596	0.901515
G+A-PK_per90	0.921717	0.934343	0.694444

Player	Luis Alberto	Hakan Çalhanoğlu	Christian Eriksen
хG	0.949495	0.949495	0.648990
прхG	0.969697	0.959596	0.676768
хA	0.987374	0.989899	0.780303
npxG+xA	0.979798	0.979798	0.742424
xG_per90	0.891414	0.891414	0.727273
xA_per90	0.977273	0.984848	0.893939
xG+xA_per90	0.969697	0.979798	0.833333
^ ^^	^ ^^1717	^ ^^^^	0.70000
In []:			
In []:			
In []:			

the following CODE chunk, copied from...

my latest draft in the "Oeuvrenalysis" folder...

...successfully produced a FACET GRID with...

...every single variable for all three players!!!

.

.

...HOWEVER, that was only possible/practical because...

...it used just THREE players... as opposed to 396 players

In []:	
In []:	
In []:	
In []:	
In [45]: ME standard state Rig 5	

Out[45]:

	Player	Nation	Pos	Squad	Comp	Age	Born	MP	Starts	Min	 хG	npx(
5	Mehdi Abeid	ALG	MF	Nantes	Ligue 1	27.0	1992.0	18	15	1320	 1.0	1.
6	Laurent Abergel	FRA	MF	Lorient	Ligue 1	27.0	1993.0	38	32	2963	 1.3	1.3
22	Yacine Adli	FRA	MF	Bordeaux	Ligue 1	20.0	2000.0	35	25	2418	 1.4	1.
26	Lucien Agoume	FRA	MF	Spezia	Serie A	18.0	2002.0	12	9	800	 0.0	0.
33	Matteo Ahlinvi	BEN	MF	Nîmes	Ligue 1	21.0	1999.0	20	10	899	 1.6	1.
2794	Andre- Frank Zambo Anguissa	CMR	MF	Fulham	Premier League	24.0	1995.0	36	29	2587	 1.8	1.
2795	Niccolò Zanellato	ITA	MF	Crotone	Serie A	22.0	1998.0	27	18	1637	 0.5	0.
2809	Piotr Zieliński	POL	MF	Napoli	Serie A	26.0	1994.0	36	32	2523	 5.4	5.
2819	Martín Zubimendi	ESP	MF	Real Sociedad	La Liga	21.0	1999.0	31	17	1882	 0.6	0.
2820	Martin Ødegaard	NOR	MF	Arsenal	Premier League	21.0	1998.0	14	9	866	 1.1	1.

396 rows × 33 columns

```
In [ ]:
 In [ ]:
 In [ ]:
In [46]: playmaking_artist_STATS = MF_standard_stats_Big_5[
                                                                     MF_standard_stats_Bi
                                                                    ]
          playmaking_artist_STATS
Out [46]:
                   Player Nation
                                       Squad Comp Age
                                                           Born MP Starts
                                                                            Min ... xG npxG
                     Luis
                                                Serie
                            ESP
            55
                                   MF
                                                     27.0 1992.0
                                                                 34
                                                                        33 2618 ... 5.5
                                         Lazio
                                                                                          5.3
                   Alberto
                   Hakan
                                                Serie
                            TUR MFFW
                                         Milan
                                                     26.0 1994.0
                                                                 33
                                                                        30 2614 ... 5.5
                                                                                          4.8
                Çalhanoğlu
                  Christian
           821
                            DEN
                                                                        17 1385 ... 1.7
                                   MF
                                                     28.0 1992.0
                                                                 26
                                                                                          1.7
                                         Inter
                   Eriksen
           3 rows × 33 columns
 In [ ]:
In [47]: playmaking_artist_STATS.set_index(
                                                   'Player',
                                                   inplace = True
 In [ ]:
In [48]: playmaking_artists_TRANSPOSED = playmaking_artist_STATS.transpose()
          nlaymaking artists TDANSDOSED
Out [48]:
                        Player Luis Alberto Hakan Çalhanoğlu Christian Eriksen
                                     ESP
                        Nation
                                                     TUR
                                                                    DEN
                          Pos
                                      MF
                                                    MFFW
                                                                     MF
                        Squad
                                    Lazio
                                                                    Inter
                                                    Milan
                                   Serie A
                                                   Serie A
                                                                   Serie A
                        Comp
                          Age
                                      27
                                                       26
                                                                      28
```

Player	Luis Alberto	Hakan Çalhanoğlu	Christian Eriksen	
Born	1992	1994	1992	
MP	34	33	26	
Starts	33	30	17	
Min	2618	2614	1385	
90s	29.1	29	15.4	
Gls	9	4	3	
Ast	2	9	0	
G-PK	9	3	3	
PK	0	1	0	
PKatt	0	1	0	
CrdY	5	4	1	
CrdR	0	0	0	
Gls_per90	0.31	0.14	0.19	
Ast_per90	0.07	0.31	0	
G+A_per90	0.38	0.45	0.19	
G-PK_per90	0.31	0.1	0.19	
G+A-PK_per90	0.38	0.41	0.19	
хG	5.5	5.5	1.7	
npxG	5.3	4.8	1.7	
хA	8.2	8.8	2.6	
npxG+xA	13.5	13.5	4.3	
xG_per90	0.19	0.19	0.11	
xA_per90	0.28	0.3	0.17	
xG+xA_per90	0.47	0.49	0.28	
npxG_per90	0.18	0.16	0.11	
npxG+xA per90	0.46	0.47	0.28	
In []:				
In []:				
In []:				

SWARM + BOX plots removed for now

•

Instead, focus should be on placing the three playmaking artists within four different contexts of comparison:

.

(1) Serie A midfielders

.

(2) Big Five midfielders

.

(3) ALL players in Serie A

.

(4) ALL players in Big Five

.

Radars next to facet grids? For each data category...

.

3 "artists" times 8 data categories = 24 different radars!

```
'Born'
Out[49]: ['Nation', 'Pos', 'Squad', 'Comp', 'Age', 'Born']
In [ ]:
In [ ]:
In [50]: # playing_time_vars = ['MP',
                                 'Starts',
                                 'Min',
                                 '90s'
         nlaving time vare
Out[50]: ['MP', 'Starts', 'Min', '90s']
In [ ]: -
In [ ]:
In [51]: # goal_contribution_vars = ['Gls',
                                      'Ast',
                                      'G-PK',
                                      'PK',
                                      'PKatt'
         goal contribution vars
Out[51]: ['Gls', 'Ast', 'G-PK', 'PK', 'PKatt']
In []: -
In [ ]: [
In [52]: # goal_contrib_vars_PER_90 = ['Gls_per90',
                                         'Ast_per90',
                                         'G+A_per90',
                                         'G-PK_per90',
                                         'G+A-PK per90'
         goal contrib yars DED OA
Out[52]: ['Gls_per90', 'Ast_per90', 'G+A_per90', 'G-PK_per90', 'G+A-PK_per90']
In []: -
In [ ]:
In [53]: # expected_goal_contrib_vars = ['xG',
```

```
'npxG',
                                          'xA',
                                          'npxG+xA'
Out [53]: [YXG^+, -4npXG1, -7XA+, 'h'pXG+xA']
In []:
In [ ]: L
In [54]: \# xG_and_xA_vars_PER_90 = ['xG_per90',
                                     'xA_per90',
                                     'xG+xA_per90',
                                     'npxG_per90',
                                     'npxG+xA_per90'
         VG and VA Ware DED OA
Out[54]: ['xG_per90', 'xA_per90', 'xG+xA_per90', 'npxG_per90', 'npxG+xA_per90
 In []: -
In [ ]: -
 In [ ]: L
 In [ ]: _
In []:
```

REMEMBER:

.

the entire goal of THIS folder...

.

...and therefore THIS code notebook...

.

...is to produce a LOOKUP TABLE...

.

```
...filled with RANKS and PERCENTILES...
     ...to provide CONTEXT for LATER...
     ...and THEN using it to analyze...
     ...specific players (with visualizations)
In []:
     (1):
     Serie A midfield RANKS
     Serie A midfield PERCENTILES
     (2):
     Serie_A_all_pos_RANKS
```

```
Serie_A_all_pos_PERCENTILES
   (3):
   Big_5_midfield_RANKS
   Big_5_midfield_PERCENTILES
   (4):
   Big_5_all_pos_RANKS
   Big_5_all_pos_PERCENTILES
In []:
In []:
In []:
In []:
In []:
In []:
```