In [1]:

```
import numpy
import pandas
```

In [2]:

```
from nba_py.player import *
from nba_py.team import *
```

In [3]:

```
PlayerList(season='2015-16').info().info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 103 entries, 0 to 102
Data columns (total 13 columns):
PERSON_ID                   103 non-null int64
DISPLAY_LAST_COMMA_FIRST    103 non-null object
DISPLAY_FIRST_LAST          103 non-null object
ROSTERSTATUS                103 non-null int64
FROM_YEAR                   103 non-null object
TO_YEAR                     103 non-null object
PLAYERCODE                  103 non-null object
TEAM_ID                     103 non-null int64
TEAM_CITY                   103 non-null object
TEAM_NAME                   103 non-null object
TEAM_ABBREVIATION           103 non-null object
TEAM_CODE                   103 non-null object
GAMES_PLAYED_FLAG           103 non-null object
dtypes: int64(3), object(10)
memory usage: 6.5+ KB
```

In [4]:

```
last_season = "2007-08"
warriors = "1610612744"
cavs = "1610612739"
thunder = "1610612760"
raps = "1610612761"
player = 2544
first_game = "1610612744"
adv = 'Advanced'
permode = 'Per100Possessions'
```

In [5]:

```
import time
```

In [6]:

```
import matplotlib.pyplot as plt
%matplotlib inline
import seaborn as sns
```

In [7]:

```
teams = TeamList().info().head(30)
```

In [8]:

```
teams.head()
```

Out[8]:

	LEAGUE_ID	TEAM_ID	MIN_YEAR	MAX_YEAR	ABBREVIATION
0	00	1610612737	1949	2017	ATL
1	00	1610612738	1946	2017	BOS
2	00	1610612739	1970	2017	CLE
3	00	1610612740	2002	2017	NOP
4	00	1610612741	1966	2017	CHI

In [9]:

```
team_ids = teams['TEAM_ID']
```

In [10]:

```
rosters = []
for team in teams['TEAM_ID']:
    rosters.append(TeamCommonRoster(team, season=last_season).roster().

```

In [ ]:

```
team_abrv = []
abbrvs = teams['ABBREVIATION']
```

In [ ]:

```
for i in range(0,30):
    team_abrv.append(abbrvs.iloc[i])
```

In [ ]:

```
team_abrv[28]
```

In [ ]:

```
def compute_stats(player_id, season):
    stats = PlayerGeneralSplits(player_id,measure_type= adv, per_mode =

```

In [15]:

```
def save_team(roster):
    stats = roster['PLAYER_ID'].apply(lambda player: compute_stats(playe
    pandas.concat([roster, stats], axis=1).to_csv('team.csv')
```

In [16]:

```
rosters[29].head()
```

Out[16]:

	TeamID	SEASON	PLAYER	NUM	POSITION	HEIGHT	WEIGHT	AGE	EXP	PLAYER_ID
0	1610612766	2007	Derek Anderson	1	G	6-5	195	33.0	10	1507
1	1610612766	2007	Gerald Wallace	3	F	6-7	220	25.0	6	2222
2	1610612766	2007	Jared Dudley	4	F	6-7	225	22.0	R	201162
3	1610612766	2007	Nazr Mohammed	6	C	6-10	250	30.0	9	1737
4	1610612766	2007	Earl Boykins	11	G	5-5	133	32.0	9	1863

In [ ]:

```
all_teams = []
for i in range(0,30):
    time.sleep(5)
    stats = rosters[i]['PLAYER_ID'].apply(lambda player: compute_stats(p
    all_teams.append(pandas.concat([rosters[i], stats], axis=1))
```

In [20]:
```
totalPlayers.head(30)
```

Out[20]:

	AGE	AST	BLK	DREB	EXP	FG3A	FG3M	FG3_PCT	FGA	FGM	.
0	25.0	1.539474	0.565789	2.618421	3	0.789474	0.289474	0.192987	7.539474	4.302632	.
1	27.0	5.780488	0.219512	3.463415	6	5.414634	2.060976	0.358744	18.256098	7.890244	.
2	23.0	2.017857	0.000000	0.803571	R	0.607143	0.125000	0.083321	4.232143	1.696429	.
3	22.0	3.358025	2.802469	6.246914	3	1.222222	0.308642	0.161506	13.987654	6.395062	.
4	24.0	0.203125	0.062500	0.343750	R	0.062500	0.000000	0.000000	0.765625	0.328125	.
5	30.0	6.041667	0.083333	3.000000	9	5.166667	1.937500	0.349000	12.562500	5.166667	.
6	30.0	NaN	NaN	NaN	6	NaN	NaN	NaN	NaN	NaN	.
7	22.0	1.530864	0.938272	6.629630	R	0.061728	0.000000	0.000000	8.246914	4.111111	.
8	25.0	0.800000	0.142857	0.571429	2	2.428571	0.828571	0.250714	5.142857	1.857143	.
9	22.0	1.712500	0.412500	4.225000	2	0.125000	0.012500	0.012500	11.475000	5.300000	.
10	24.0	0.580645	0.209677	2.564516	4	0.048387	0.000000	0.000000	3.951613	1.725806	.
11	24.0	0.074074	0.000000	0.296296	1	0.703704	0.259259	0.160481	1.629630	0.592593	.
12	23.0	0.000000	0.142857	0.657143	1	0.057143	0.000000	0.000000	0.857143	0.342857	.
0	24.0	0.267857	0.285714	2.357143	1	0.017857	0.000000	0.000000	4.803571	2.750000	.
1	32.0	3.436620	1.253521	7.323944	12	0.154930	0.000000	0.000000	13.943662	7.521127	.
2	22.0	5.103896	0.168831	3.168831	1	0.246753	0.064935	0.051948	9.259740	4.558442	.
3	22.0	0.405797	0.289855	1.637681	R	0.000000	0.000000	0.000000	3.202899	1.550725	.
4	22.0	0.866667	0.000000	0.466667	R	0.800000	0.200000	0.166667	2.600000	0.933333	.
5	32.0	3.082192	0.219178	2.643836	11	6.191781	2.465753	0.395027	13.506849	6.013699	.
6	38.0	3.890909	0.109091	2.163636	14	1.381818	0.418182	0.155455	9.672727	4.236364	.
7	30.0	4.537500	0.450000	4.475000	9	4.562500	1.787500	0.354038	13.725000	6.362500	.
8	31.0	1.540541	0.256757	3.945946	8	3.770270	1.432432	0.318919	5.594595	2.337838	.
9	26.0	1.520000	0.280000	1.786667	3	0.760000	0.240000	0.126667	5.186667	2.253333	.
10	23.0	1.076923	1.461538	4.217949	4	0.012821	0.000000	0.000000	4.461538	2.743590	.
11	30.0	0.833333	0.166667	1.187500	6	0.958333	0.312500	0.179167	1.958333	0.604167	.
12	30.0	1.948718	0.128205	1.897436	7	3.820513	1.500000	0.379936	6.807692	2.782051	.
13	33.0	0.136364	0.272727	1.045455	10	0.000000	0.000000	0.000000	1.045455	0.545455	.
14	38.0	0.555556	0.444444	2.166667	14	0.055556	0.000000	0.000000	2.277778	0.777778	.
0	22.0	2.500000	0.241379	1.793103	1	4.620690	2.034483	0.413017	8.017241	3.465517	.
1	24.0	1.607843	0.117647	1.823529	4	2.235294	0.666667	0.237608	7.901961	2.862745	.

30 rows × 34 columns

In [19]:
```
totalPlayers = pandas.concat(all_teams)
```

In [21]:

```
totalPlayers.to_csv('players_0708.csv')
```

In [22]:

```
significantPlayers = totalPlayers[totalPlayers['MIN'] > 10.0]
```

In [23]:

```
significantPlayers = significantPlayers[significantPlayers['GP'] > 40]
```

In [24]:

```
significantPlayers['FG3_PCT_ADJ'] = significantPlayers['FG3_PCT'].apply(
```

In [25]:

```
significantPlayers.to_csv('sig_players_0708.csv')
```

In [26]:

```
all_players = []
players_0708 = pandas.read_csv('players_0708.csv')
all_players.append(players_0708)

players_0809 = pandas.read_csv('players_0809.csv')
all_players.append(players_0809)

players_0910 = pandas.read_csv('players_0910.csv')
all_players.append(players_0910)

players_1011 = pandas.read_csv('players_1011.csv')
all_players.append(players_1011)

players_1112 = pandas.read_csv('players_1112.csv')
all_players.append(players_1112)

players_1213 = pandas.read_csv('players_1213.csv')
all_players.append(players_1213)

players_1314 = pandas.read_csv('players_1314.csv')
all_players.append(players_1314)

players_1415 = pandas.read_csv('players_1415.csv')
all_players.append(players_1415)

players_1516 = pandas.read_csv('players_1516.csv')
all_players.append(players_1516)

players_1617 = pandas.read_csv('players_1617.csv')
all_players.append(players_1617)
```

In [27]:

```
all_players_df = pandas.concat(all_players)
```

In [13]:

```
all_players_df = pandas.read_csv('all_players_0717')
```

In [14]:

```
all_players_df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 4422 entries, 0 to 4421
Data columns (total 37 columns):
Unnamed: 0        4422 non-null int64
AGE               4422 non-null float64
AST               4345 non-null float64
BLK               4345 non-null float64
DREB              4345 non-null float64
EXP               4422 non-null object
FG3A              4345 non-null float64
FG3M              4345 non-null float64
FG3_PCT           4345 non-null float64
FGA               4345 non-null float64
FGM               4345 non-null float64
FG_PCT            4345 non-null float64
FTA               4345 non-null float64
FTM               4345 non-null float64
FT_PCT            4345 non-null float64
GP                4422 non-null float64
HEIGHT            4422 non-null object
LOSES             4422 non-null float64
MIN               4345 non-null float64
NUM               4411 non-null float64
OREB              4345 non-null float64
PF                4345 non-null float64
PLAYER            4422 non-null object
PLAYER_ID         4422 non-null int64
PLUS_MINUS        4345 non-null float64
POSITION          4422 non-null object
PTS               4345 non-null float64
REB               4345 non-null float64
SEASON            4422 non-null int64
STL               4345 non-null float64
TOV               4345 non-null float64
TeamID            4422 non-null int64
Unnamed: 0.1      4422 non-null int64
Unnamed: 0.1.1    451 non-null float64
WEIGHT            4422 non-null int64
WINS              4422 non-null float64
WL                0 non-null float64
dtypes: float64(27), int64(6), object(4)
memory usage: 1.2+ MB
```

In [15]:

```
columns = ['Unnamed: 0', 'Unnamed: 0.1', 'WL']
all_players_df.drop(columns, inplace=True, axis=1)
```

In [16]:

```
all_players_df = all_players_df.dropna()
all_players_df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 446 entries, 3971 to 4421
Data columns (total 34 columns):
AGE                  446 non-null float64
AST                  446 non-null float64
BLK                  446 non-null float64
DREB                 446 non-null float64
EXP                  446 non-null object
FG3A                 446 non-null float64
FG3M                 446 non-null float64
FG3_PCT              446 non-null float64
FGA                  446 non-null float64
FGM                  446 non-null float64
FG_PCT               446 non-null float64
FTA                  446 non-null float64
FTM                  446 non-null float64
FT_PCT               446 non-null float64
GP                   446 non-null float64
HEIGHT               446 non-null object
LOSES                446 non-null float64
MIN                  446 non-null float64
NUM                  446 non-null float64
OREB                 446 non-null float64
PF                   446 non-null float64
PLAYER               446 non-null object
PLAYER_ID            446 non-null int64
PLUS_MINUS           446 non-null float64
POSITION             446 non-null object
PTS                  446 non-null float64
REB                  446 non-null float64
SEASON               446 non-null int64
STL                  446 non-null float64
TOV                  446 non-null float64
TeamID               446 non-null int64
Unnamed: 0.1.1       446 non-null float64
WEIGHT               446 non-null int64
WINS                 446 non-null float64
dtypes: float64(26), int64(4), object(4)
memory usage: 115.0+ KB
```

In [17]:

```
sigplayers = all_players_df[all_players_df['MIN'] > 25.0]
```

In [18]:

```
sigplayers = all_players_df[all_players_df['GP'] > 30]
```

In [19]:

```
sigplayers.to_csv('sig_players_0717')
```

In [20]:

```
sigplayers.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 375 entries, 3971 to 4421
Data columns (total 34 columns):
AGE                 375 non-null float64
AST                 375 non-null float64
BLK                 375 non-null float64
DREB                375 non-null float64
EXP                 375 non-null object
FG3A                375 non-null float64
FG3M                375 non-null float64
FG3_PCT             375 non-null float64
FGA                 375 non-null float64
FGM                 375 non-null float64
FG_PCT              375 non-null float64
FTA                 375 non-null float64
FTM                 375 non-null float64
FT_PCT              375 non-null float64
GP                  375 non-null float64
HEIGHT              375 non-null object
LOSES               375 non-null float64
MIN                 375 non-null float64
NUM                 375 non-null float64
OREB                375 non-null float64
PF                  375 non-null float64
PLAYER              375 non-null object
PLAYER_ID           375 non-null int64
PLUS_MINUS          375 non-null float64
POSITION            375 non-null object
PTS                 375 non-null float64
REB                 375 non-null float64
SEASON              375 non-null int64
STL                 375 non-null float64
TOV                 375 non-null float64
TeamID              375 non-null int64
Unnamed: 0.1.1      375 non-null float64
WEIGHT              375 non-null int64
WINS                375 non-null float64
dtypes: float64(26), int64(4), object(4)
memory usage: 96.7+ KB
```

In [21]:

```
sigplayers['AST_PER_MIN'] = sigplayers['AST']/sigplayers['MIN']
```

```
C:\Users\tkauk\Anaconda3\lib\site-packages\ipykernel\__main__.py:1: Setti
ngWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-doc
s/stable/indexing.html#indexing-view-versus-copy (http://pandas.pydata.or
g/pandas-docs/stable/indexing.html#indexing-view-versus-copy)
  if __name__ == '__main__':
```

In [22]:

```
sigplayers['BLK_PER_MIN'] = sigplayers['BLK']/sigplayers['MIN']
```

```
C:\Users\tkauk\Anaconda3\lib\site-packages\ipykernel\__main__.py:1: Setti
ngWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-doc
s/stable/indexing.html#indexing-view-versus-copy (http://pandas.pydata.or
g/pandas-docs/stable/indexing.html#indexing-view-versus-copy)
  if __name__ == '__main__':
```

In [23]:

```
sigplayers['PTS_PER_MIN'] = sigplayers['PTS']/sigplayers['MIN']
```

```
C:\Users\tkauk\Anaconda3\lib\site-packages\ipykernel\__main__.py:1: Setti
ngWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-doc
s/stable/indexing.html#indexing-view-versus-copy (http://pandas.pydata.or
g/pandas-docs/stable/indexing.html#indexing-view-versus-copy)
  if __name__ == '__main__':
```

In [24]:

```
sigplayers['STL_PER_MIN'] = sigplayers['STL']/sigplayers['MIN']
```

```
C:\Users\tkauk\Anaconda3\lib\site-packages\ipykernel\__main__.py:1: Setti
ngWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-doc
s/stable/indexing.html#indexing-view-versus-copy (http://pandas.pydata.or
g/pandas-docs/stable/indexing.html#indexing-view-versus-copy)
  if __name__ == '__main__':
```

In [25]:

```
sigplayers['TOV_PER_MIN'] = sigplayers['TOV']/sigplayers['MIN']
```

```
C:\Users\tkauk\Anaconda3\lib\site-packages\ipykernel\__main__.py:1: Setti
ngWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-doc
s/stable/indexing.html#indexing-view-versus-copy (http://pandas.pydata.or
g/pandas-docs/stable/indexing.html#indexing-view-versus-copy)
  if __name__ == '__main__':
```

In [26]:

```
sigplayers['FGA_PER_MIN'] = sigplayers['FGA']/sigplayers['MIN']
```

```
C:\Users\tkauk\Anaconda3\lib\site-packages\ipykernel\__main__.py:1: Setti
ngWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-doc
s/stable/indexing.html#indexing-view-versus-copy (http://pandas.pydata.or
g/pandas-docs/stable/indexing.html#indexing-view-versus-copy)
  if __name__ == '__main__':
```

In [27]:

```
sigplayers['FG3A_PER_MIN'] = sigplayers['FG3A']/sigplayers['MIN']
```

```
C:\Users\tkauk\Anaconda3\lib\site-packages\ipykernel\__main__.py:1: Setti
ngWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-doc
s/stable/indexing.html#indexing-view-versus-copy (http://pandas.pydata.or
g/pandas-docs/stable/indexing.html#indexing-view-versus-copy)
  if __name__ == '__main__':
```

In [28]:

```
sigplayers['FTA_PER_MIN'] = sigplayers['FTA']/sigplayers['MIN']
```

```
C:\Users\tkauk\Anaconda3\lib\site-packages\ipykernel\__main__.py:1: Setti
ngWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-doc
s/stable/indexing.html#indexing-view-versus-copy (http://pandas.pydata.or
g/pandas-docs/stable/indexing.html#indexing-view-versus-copy)
  if __name__ == '__main__':
```

In [29]:

```
sigplayers['REB_PER_MIN'] = sigplayers['REB']/sigplayers['MIN']
```

```
C:\Users\tkauk\Anaconda3\lib\site-packages\ipykernel\__main__.py:1: Setti
ngWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-doc
s/stable/indexing.html#indexing-view-versus-copy (http://pandas.pydata.or
g/pandas-docs/stable/indexing.html#indexing-view-versus-copy)
  if __name__ == '__main__':
```

In [30]:

```
bigmen_list = []
bigmen_list.append(sigplayers[sigplayers['POSITION'] == 'F'])
bigmen_list.append(sigplayers[sigplayers['POSITION'] == 'F-C'])
bigmen_list.append(sigplayers[sigplayers['POSITION'] == 'C-F'])
bigmen_list.append(sigplayers[sigplayers['POSITION'] == 'C'])

sig_bigmen = pandas.concat(bigmen_list)
```

In [31]:

```
sig_guards.info()
```

```
---------------------------------------------------------------------------
--
NameError                                 Traceback (most recent call las
t)
<ipython-input-31-84e55bc4b38e> in <module>()
----> 1 sig_guards.info()

NameError: name 'sig_guards' is not defined
```

In [301]:

```
sig_guards['TALL'] = sig_guards['HEIGHT'].apply(lambda x:True if (x.spl
```

In [ ]:

```

```

In [185]:

```
sigplayers.info()
```

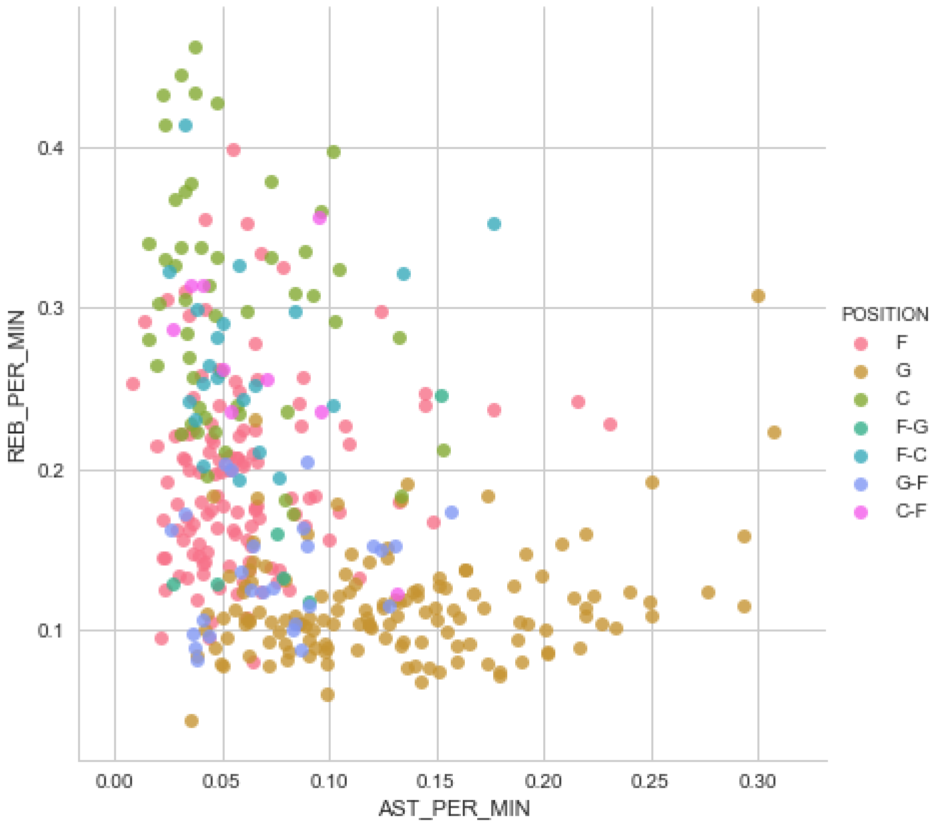
```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 2327 entries, 0 to 450
Data columns (total 41 columns):
AGE             2327 non-null float64
AST             2327 non-null float64
BLK             2327 non-null float64
DREB            2327 non-null float64
EXP             2327 non-null object
FG3A            2327 non-null float64
FG3M            2327 non-null float64
FG3_PCT         2327 non-null float64
FGA             2327 non-null float64
FGM             2327 non-null float64
FG_PCT          2327 non-null float64
FTA             2327 non-null float64
FTM             2327 non-null float64
FT_PCT          2327 non-null float64
GP              2327 non-null float64
HEIGHT          2327 non-null object
LOSES           2327 non-null float64
MIN             2327 non-null float64
NUM             2327 non-null float64
OREB            2327 non-null float64
PF              2327 non-null float64
PLAYER          2327 non-null object
PLAYER_ID       2327 non-null int64
PLUS_MINUS      2327 non-null float64
POSITION        2327 non-null object
PTS             2327 non-null float64
REB             2327 non-null float64
SEASON          2327 non-null int64
STL             2327 non-null float64
TOV             2327 non-null float64
TeamID          2327 non-null int64
WEIGHT          2327 non-null int64
WINS            2327 non-null float64
BLK_PER_MIN     2327 non-null float64
PTS_PER_MIN     2327 non-null float64
STL_PER_MIN     2327 non-null float64
TOV_PER_MIN     2327 non-null float64
FGA_PER_MIN     2327 non-null float64
FG3A_PER_MIN    2327 non-null float64
FTA_PER_MIN     2327 non-null float64
REB_PER_MIN     2327 non-null float64
dtypes: float64(33), int64(4), object(4)
memory usage: 727.2+ KB
```

In [32]:

```
sns.set_style('whitegrid')
sns.lmplot('AST_PER_MIN','REB_PER_MIN',data=sigplayers, hue='POSITION',
           size=6,aspect=1,fit_reg=False)
```

Out[32]:

```
<seaborn.axisgrid.FacetGrid at 0xd086df0>
```



In [33]:

```
sigplayers['POSITION'] = sigplayers['POSITION'].apply(lambda x: 'G' if
```

```
C:\Users\tkauk\Anaconda3\lib\site-packages\ipykernel\__main__.py:1: Setti
ngWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-doc
s/stable/indexing.html#indexing-view-versus-copy (http://pandas.pydata.or
g/pandas-docs/stable/indexing.html#indexing-view-versus-copy)
  if __name__ == '__main__':
```

In [34]:

```
sigplayers['POSITION'] = sigplayers['POSITION'].apply(lambda x: 'C' if
```

```
C:\Users\tkauk\Anaconda3\lib\site-packages\ipykernel\__main__.py:1: Setti
ngWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-doc
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g/pandas-docs/stable/indexing.html#indexing-view-versus-copy)
  if __name__ == '__main__':
```

In [35]:

```python
from sklearn.cluster import KMeans
```

In [36]:

```python
sigplayers['POSITION'] = sigplayers['POSITION'].apply(lambda x: 'F' if (
```

```
C:\Users\tkauk\Anaconda3\lib\site-packages\ipykernel\__main__.py:1: Setti
ngWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-doc
s/stable/indexing.html#indexing-view-versus-copy (http://pandas.pydata.or
g/pandas-docs/stable/indexing.html#indexing-view-versus-copy)
  if __name__ == '__main__':
```

In [37]:

```python
sigplayers['POSITION'] = sigplayers['POSITION'].apply(lambda x: 'F' if (
```

```
C:\Users\tkauk\Anaconda3\lib\site-packages\ipykernel\__main__.py:1: Setti
ngWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-doc
s/stable/indexing.html#indexing-view-versus-copy (http://pandas.pydata.or
g/pandas-docs/stable/indexing.html#indexing-view-versus-copy)
  if __name__ == '__main__':
```

In [39]:

```python
kmeans = KMeans(n_clusters=5)
```

In [40]:

```python
cols = ['LOSES','PLAYER','PLAYER_ID','POSITION','SEASON','TeamID','WINS
sig_players= sigplayers.drop(labels = cols, axis = 1)
```

In [42]:

```python
import pandas as pd
from sklearn import preprocessing


min_max_scaler = preprocessing.MinMaxScaler()
np_scaled = min_max_scaler.fit_transform(sig_players)
df_normalized = pd.DataFrame(np_scaled)

```

In [43]:

```python
kmeans.fit(sig_players)
```

Out[43]:

```
KMeans(algorithm='auto', copy_x=True, init='k-means++', max_iter=300,
    n_clusters=5, n_init=10, n_jobs=1, precompute_distances='auto',
    random_state=None, tol=0.0001, verbose=0)
```

```
In [44]:  kmeans.cluster_centers_
```

```
Out[44]: array([[  3.92414691e+00,   6.02231848e-01,   4.64404260e+00,
                   4.52686263e+00,   1.67601452e+00,   3.06325902e-01,
                   1.44800697e+01,   6.72383958e+00,   4.62834178e-01,
                   4.52289746e+00,   3.63162459e+00,   6.71973706e-01,
                   7.25789474e+01,   3.27235824e+01,   1.02105263e+01,
                   1.25914929e+00,   2.26816438e+00,   1.48351173e+00,
                   1.87553183e+01,   5.90341119e+00,   1.11032939e+00,
                   2.18429860e+00,   4.92105263e+00,   1.18599943e-01,
                   1.84572159e-02,   5.69091677e-01,   3.38475535e-02,
                   6.62496679e-02,   4.40422728e-01,   1.38074737e-01,
                   1.36292147e-01,   1.80775488e-01],
                [  1.86670393e+00,   4.10293858e-01,   2.89962105e+00,
                   2.19243237e+00,   7.74245570e-01,   2.30571040e-01,
                   6.68523868e+00,   3.02018139e+00,   4.31204880e-01,
                   1.55903030e+00,   1.15678989e+00,   3.81314252e-01,
                   7.39925926e+01,   2.20328977e+01,   1.01111111e+01,
                   9.25956763e-01,   1.91367131e+00,  -2.20840772e-01,
                   7.97139824e+00,   3.82557781e+00,   6.99889250e-01,
                   1.08484716e+00,   5.28888889e+00,   8.38280471e-02,
                   1.90940325e-02,   3.62663601e-01,   3.16425291e-02,
                   4.94238333e-02,   3.04514844e-01,   9.93068775e-02,
                   7.08509548e-02,   1.74955331e-01],
                [  1.37384702e+00,   3.16662918e-01,   2.09265004e+00,
                   1.60482154e+00,   5.53813063e-01,   1.79107772e-01,
                   5.20527930e+00,   2.27791925e+00,   3.78595477e-01,
                   1.35250186e+00,   9.95968582e-01,   3.14165324e-01,
                   4.40243902e+01,   1.59177262e+01,   1.12073171e+01,
                   6.78669366e-01,   1.48586814e+00,  -9.85314030e-01,
                   6.10562014e+00,   2.77131941e+00,   5.05059390e-01,
                   8.98948461e-01,   5.48780488e+00,   8.26401028e-02,
                   2.00796908e-02,   3.69777896e-01,   3.18497580e-02,
                   5.45431640e-02,   3.19729989e-01,   9.97823131e-02,
                   8.05892867e-02,   1.71866440e-01],
                [  1.22950750e+00,   4.77514029e-01,   2.68848124e+00,
                   1.93929970e+00,   6.74869658e-01,   1.96325761e-01,
                   5.09202616e+00,   2.44175024e+00,   4.33956384e-01,
                   1.26309983e+00,   9.10006155e-01,   3.08177705e-01,
                   6.42857143e+01,   1.83954979e+01,   9.02857143e+01,
                   9.35050741e-01,   1.79235160e+00,   1.11887501e+00,
                   6.46837630e+00,   3.62353198e+00,   5.96170567e-01,
                   8.22767656e-01,   1.38571429e+01,   6.75533991e-02,
                   2.53120708e-02,   3.41860662e-01,   3.13929986e-02,
                   4.63047416e-02,   2.78462645e-01,   9.75265903e-02,
                   6.45653502e-02,   1.96051708e-01],
                [  1.58002569e+00,   4.78943803e-01,   3.08721228e+00,
                   2.11264374e+00,   7.45652866e-01,   2.08563374e-01,
                   6.90550750e+00,   3.20142159e+00,   4.32362016e-01,
                   1.72367467e+00,   1.32941238e+00,   3.95593501e-01,
                   6.42800000e+01,   2.08620014e+01,   3.66400000e+01,
                   9.44979976e-01,   1.81732435e+00,  -3.40198060e-01,
                   8.47790843e+00,   4.03219225e+00,   6.04774035e-01,
                   1.01344228e+00,   1.22933333e+01,   6.98794646e-02,
                   2.41422895e-02,   3.89546426e-01,   2.86476884e-02,
                   4.76066596e-02,   3.18802318e-01,   9.55142019e-02,
                   7.91335998e-02,   1.99068444e-01]])
```

In [46]:

```
labels = kmeans.predict(sig_players)
```

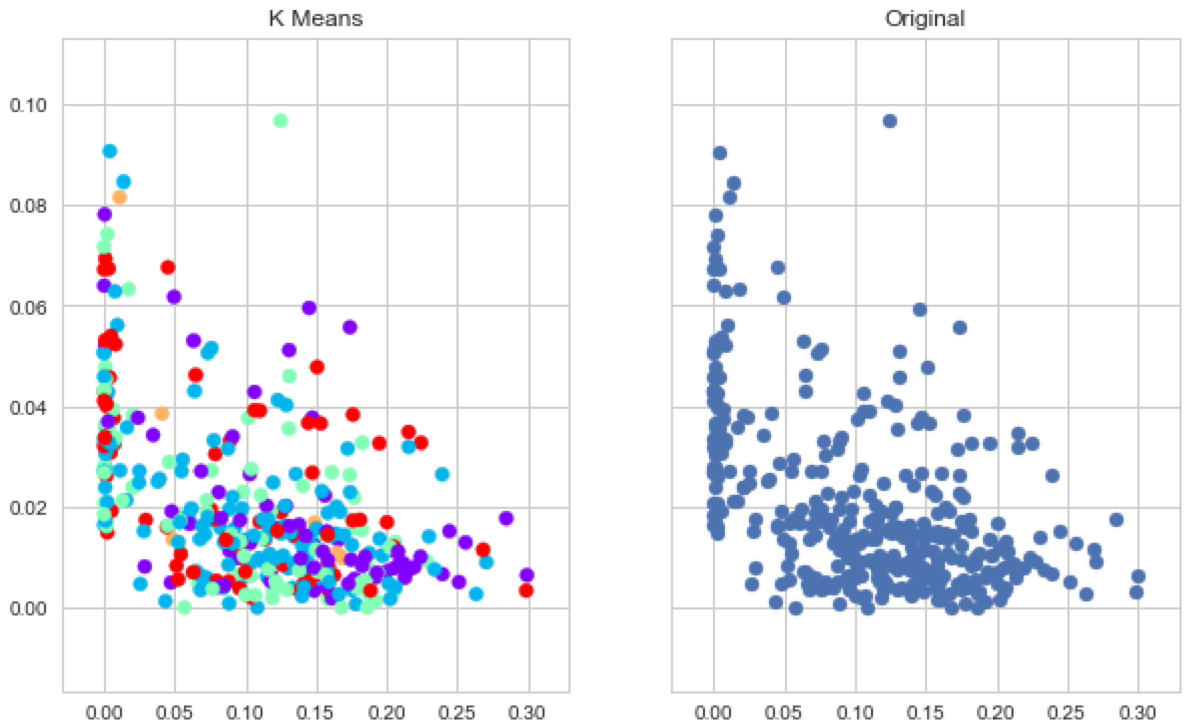
In [47]:

```
centroids = kmeans.cluster_centers_
```

In [51]:

```
f, (ax1, ax2) = plt.subplots(1, 2, sharey=True,figsize=(10,6))
ax1.set_title('K Means')
ax1.scatter(sigplayers['FG3A_PER_MIN'],sigplayers['BLK_PER_MIN'],c=kmean
ax2.set_title("Original")
ax2.scatter(sigplayers['FG3A_PER_MIN'],sigplayers['BLK_PER_MIN'],cmap=s
plt.savefig('K_means_graph.png')

```



In [52]:

```
sigplayers['REAL_POSITION'] = labels
```

```
C:\Users\tkauk\Anaconda3\lib\site-packages\ipykernel\__main__.py:1: Setti
ngWithCopyWarning:
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g/pandas-docs/stable/indexing.html#indexing-view-versus-copy)
  if __name__ == '__main__':
```

In [54]:

```
sigplayers['REAL_POSITION'].value_counts()
```

Out[54]:

```
1    135
2     82
0     76
4     75
3      7
Name: REAL_POSITION, dtype: int64
```

```
In [56]: sig_players_name = sigplayers[['PLAYER','POSITION','REAL_POSITION']]
In [298]: sig_bigmen_name.head(100)
```

Out[298]:

	PLAYER	TRUE_POS	REAL_POSITION
3	Josh Smith	F	1
9	Marvin Williams	F	1
12	Solomon Jones	C	0
13	Leon Powe	C	0
14	Kevin Garnett	F	1
16	Glen Davis	F	1
20	Paul Pierce	F	1
21	James Posey	F	1
31	Wally Szczerbiak	F	1
38	LeBron James	F	1
50	Peja Stojakovic	F	1
52	David West	F	1
53	Julian Wright	C	0
55	Ryan Bowen	C	0
58	Andres Nocioni	F	1
61	Luol Deng	F	1
67	Tyrus Thomas	F	1
71	Drew Gooden	C	0
80	Malik Allen	F	1
82	Brandon Bass	F	1
84	Dirk Nowitzki	F	1
86	Juwan Howard	C	0
90	Kenyon Martin	F	1
92	Bobby Jones	C	0
94	Carmelo Anthony	F	1
95	Eduardo Najera	F	1
101	Stephen Jackson	F	1
102	Mickael Pietrus	F	1
110	Matt Barnes	F	1
113	Brandan Wright	C	0
...	...	...	...
272	Reggie Evans	F	1
296	Raef LaFrentz	C	0

	PLAYER	TRUE_POS	REAL_POSITION
301	Travis Outlaw	F	1
302	James Jones	C	0
318	Metta World Peace	C	0
322	Ime Udoka	F	1
326	Bruce Bowen	F	1
337	Mickael Gelabale	C	0
341	Jeff Green	F	1
348	Chris Wilcox	C	0
350	Chris Bosh	F	1
356	Joey Graham	C	0
359	Jason Kapono	F	1
360	Jamario Moon	F	1
361	Kris Humphries	C	0
363	Carlos Boozer	F	1
367	Matt Harpring	F	1
375	Andrei Kirilenko	F	1
379	Hakim Warrick	F	1
380	Rudy Gay	F	1
385	Brian Cardinal	C	0
386	Andre Brown	C	0
391	Caron Butler	F	1
392	Antawn Jamison	F	1
393	Dominic McGuire	F	1
396	Darius Songaila	F	1
398	Andray Blatche	F	1
403	Walter Herrmann	C	0
405	Jarvis Hayes	F	1
407	Tayshaun Prince	F	1

100 rows × 3 columns