ML7 Assignment - KNN algorithm to predict "how many points NBA players scored in the 2013-2014 season".

In [1]:

```
# Importing the libraries
import numpy as np
import matplotlib.pyplot as plt
import pandas as pd
```

In [2]:

```
# Importing the dataset
nba = pd.read_csv('nba_2013.csv')
```

In [3]:

```
nba.head(5)
```

Out[3]:

	player	pos	age	bref_team_id	g	gs	mp	fg	fga	fg.	...	drb	trb	ast	stl	bll
0	Quincy Acy	SF	23	TOT	63	0	847	66	141	0.468	...	144	216	28	23	2(
1	Steven Adams	C	20	OKC	81	20	1197	93	185	0.503	...	190	332	43	40	5[
2	Jeff Adrien	PF	27	TOT	53	12	961	143	275	0.520	...	204	306	38	24	3(
3	Arron Afflalo	SG	28	ORL	73	73	2552	464	1011	0.459	...	230	262	248	35	3
4	Alexis Ajinca	C	25	NOP	56	30	951	136	249	0.546	...	183	277	40	23	4(

5 rows × 31 columns

In [4]:

```
nba.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 481 entries, 0 to 480
Data columns (total 31 columns):
player          481 non-null object
pos             481 non-null object
age             481 non-null int64
bref_team_id    481 non-null object
g               481 non-null int64
gs              481 non-null int64
mp              481 non-null int64
fg              481 non-null int64
fga             481 non-null int64
fg.             479 non-null float64
x3p             481 non-null int64
x3pa            481 non-null int64
x3p.            414 non-null float64
x2p             481 non-null int64
x2pa            481 non-null int64
x2p.            478 non-null float64
efg.            479 non-null float64
ft              481 non-null int64
fta             481 non-null int64
ft.             461 non-null float64
orb             481 non-null int64
drb             481 non-null int64
trb             481 non-null int64
ast             481 non-null int64
stl             481 non-null int64
blk             481 non-null int64
tov             481 non-null int64
pf              481 non-null int64
pts             481 non-null int64
season          481 non-null object
season_end      481 non-null int64
dtypes: float64(5), int64(22), object(4)
memory usage: 116.6+ KB
```

In [5]:

```
nba.describe()
```

Out[5]:

	age	g	gs	mp	fg	fga	fg.
count	481.000000	481.000000	481.000000	481.000000	481.000000	481.000000	479.000000
mean	26.509356	53.253638	25.571726	1237.386694	192.881497	424.463617	0.436436
std	4.198265	25.322711	29.658465	897.258840	171.832793	368.850833	0.098672
min	19.000000	1.000000	0.000000	1.000000	0.000000	0.000000	0.000000
25%	23.000000	32.000000	0.000000	388.000000	47.000000	110.000000	0.400500
50%	26.000000	61.000000	10.000000	1141.000000	146.000000	332.000000	0.438000
75%	29.000000	76.000000	54.000000	2016.000000	307.000000	672.000000	0.479500
max	39.000000	83.000000	82.000000	3122.000000	849.000000	1688.000000	1.000000

8 rows × 27 columns

EDA & Data Preprocessing

In [6]:

```
#Finding missing values
total = nba.isnull().sum().sort_values(ascending=False)
percent_1 = nba.isnull().sum()/nba.isnull().count()*100
percent_2 = (round(percent_1, 1)).sort_values(ascending=False)
missing_data = pd.concat([total, percent_2], axis=1, keys=['Total', '%'])
missing_data.head(5)
```

Out[6]:

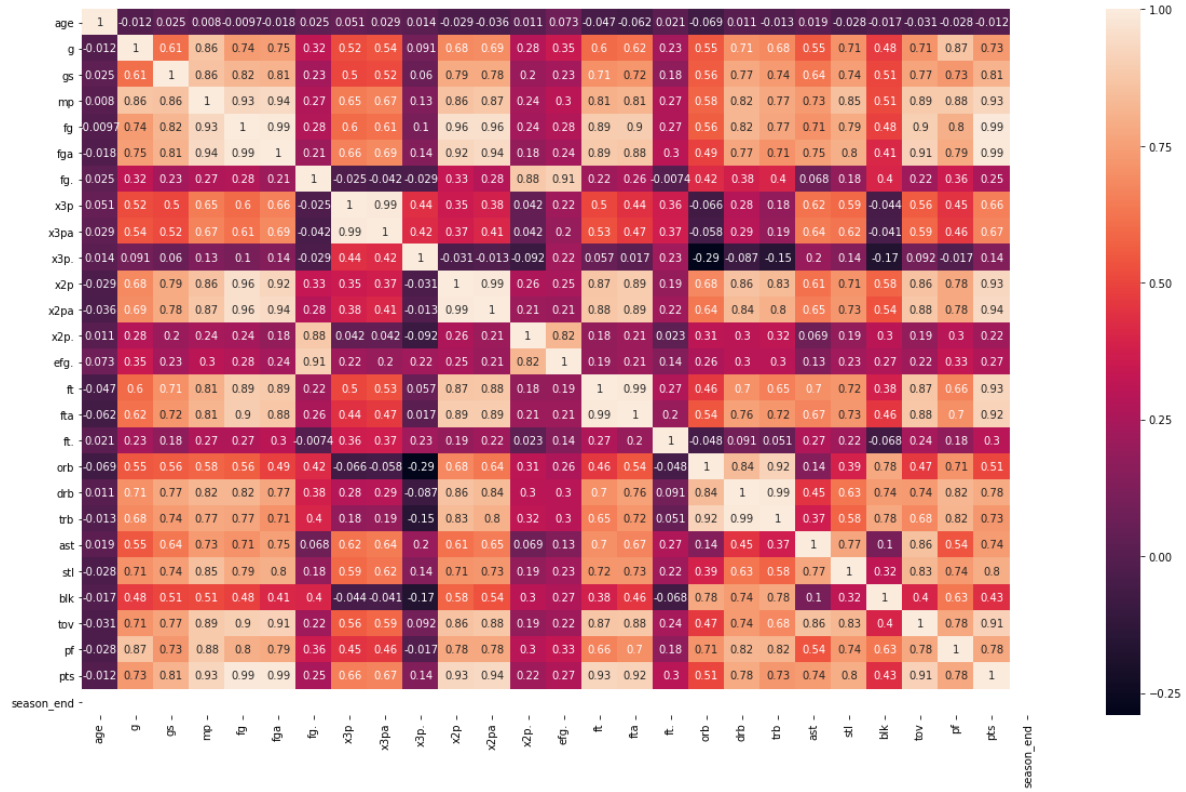
	Total	%
x3p.	67	13.9
ft.	20	4.2
x2p.	3	0.6
fg.	2	0.4
efg.	2	0.4

In [7]:

```
#Replacing the missing values with mean
nba = nba.fillna(nba.mean())
```

In [9]:

```
import seaborn as sns
hmap = nba.corr()
plt.subplots(figsize=(20, 12))
sns.heatmap(hmap,annot=True);
```



The target column pts has high correlation with maximum of the numerical features

In [10]:

```
X_columns = ['age', 'g', 'gs', 'mp', 'fg', 'fga','fg.', 'x3p', 'x3pa', 'x3p.', 'x2p', 'x2pa',
       'fta', 'ft.', 'orb', 'drb', 'trb', 'ast', 'stl', 'blk', 'tov', 'pf']
y_column = 'pts'
```

In [11]:

```
X = nba[X_columns]
y = nba[y_column]
```

In [12]:

```
#Split the data in train & test
from sklearn.model_selection import train_test_split
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size = 1/3, random_state = 0
```

KNN model

In [13]:

```
from sklearn.neighbors import KNeighborsRegressor
knn = KNeighborsRegressor(n_neighbors=5)
knn.fit(X_train, y_train)
y_pred = knn.predict(X_test)
```

In [14]:

```
mse = (((y_pred - y_test) ** 2).sum()) / len(y_pred)
```

In [15]:

```
print(mse)
print("predictions[:5]:\n", y_pred[:5])
print("actual[:5]:\n", y_test[:5])
```

```
5434.724223602485
predictions[:5]:
 [ 316.6  693.6 1069.6   11.8  903.4]
actual[:5]:
 15      436
124     717
141    1096
263      19
170     988
Name: pts, dtype: int64
```