

```
In [1]: import numpy as np

#Seasons
Seasons = ["2005", "2006", "2007", "2008", "2009", "2010", "2011", "2012", "2013", "2014"]
Sdict = {"2005":0,"2006":1,"2007":2,"2008":3,"2009":4,"2010":5,"2011":6,"2012":7,"2013":8,"2014":9}

#Players
Players = ["KobeBryant", "JoeJohnson", "LeBronJames", "CarmeloAnthony", "DwightHoward", "ChrisBosh", "ChrisPaul", "KevinDurant", "DerrickRose", "DwyaneWade"]
Pdict = {"KobeBryant":0, "JoeJohnson":1, "LeBronJames":2, "CarmeloAnthony":3, "DwightHoward":4, "ChrisBosh":5, "ChrisPaul":6, "KevinDurant":7, "DerrickRose":8, "DwyaneWade":9}

#Salaries
KobeBryant_Salary = [15946875, 17718750, 19490625, 21262500, 23034375, 24806250, 25244493, 27011250, 28781250, 30541250]
JoeJohnson_Salary = [12000000, 12744189, 13488377, 14232567, 14976754, 16324500, 18038573, 19051250, 20801250, 22551250]
LeBronJames_Salary = [4621800, 5828090, 13041250, 14410581, 15779912, 14500000, 16022500, 17501250, 19001250, 20501250]
CarmeloAnthony_Salary = [3713640, 4694041, 13041250, 14410581, 15779912, 17149243, 18518574, 20001250, 21501250, 23001250]
DwightHoward_Salary = [4493160, 4806720, 6061274, 13758000, 15202590, 16647180, 18091770, 19501250, 21001250, 22501250]
ChrisBosh_Salary = [3348000, 4235220, 12455000, 14410581, 15779912, 14500000, 16022500, 17545000, 19045000, 20545000]
ChrisPaul_Salary = [3144240, 3380160, 3615960, 4574189, 13520500, 14940153, 16359805, 17779450, 19279450, 20779450]
KevinDurant_Salary = [0, 0, 4171200, 4484040, 4796880, 6053663, 15506632, 16669630, 17832627, 19000000, 20500000]
DerrickRose_Salary = [0, 0, 0, 4822800, 5184480, 5546160, 6993708, 16402500, 17632688, 18862875, 20000000, 21500000]
DwyaneWade_Salary = [3031920, 3841443, 13041250, 14410581, 15779912, 14200000, 15691000, 17181000, 18681000, 20181000]
#Matrix
Salary = np.array([KobeBryant_Salary, JoeJohnson_Salary, LeBronJames_Salary, CarmeloAnthony_Salary, DwightHoward_Salary, ChrisBosh_Salary, ChrisPaul_Salary, KevinDurant_Salary, DerrickRose_Salary, DwyaneWade_Salary])

#Games
KobeBryant_G = [80, 77, 82, 82, 73, 82, 58, 78, 6, 35]
JoeJohnson_G = [82, 57, 82, 79, 76, 72, 60, 72, 79, 80]
LeBronJames_G = [79, 78, 75, 81, 76, 79, 62, 76, 77, 69]
CarmeloAnthony_G = [80, 65, 77, 66, 69, 77, 55, 67, 77, 40]
DwightHoward_G = [82, 82, 82, 79, 82, 78, 54, 76, 71, 41]
ChrisBosh_G = [70, 69, 67, 77, 70, 77, 57, 74, 79, 44]
ChrisPaul_G = [78, 64, 80, 78, 45, 80, 60, 70, 62, 82]
KevinDurant_G = [35, 35, 80, 74, 82, 78, 66, 81, 81, 27]
DerrickRose_G = [40, 40, 40, 81, 78, 81, 39, 0, 10, 51]
DwyaneWade_G = [75, 51, 51, 79, 77, 76, 49, 69, 54, 62]
#Matrix
Games = np.array([KobeBryant_G, JoeJohnson_G, LeBronJames_G, CarmeloAnthony_G, DwightHoward_G, ChrisBosh_G, ChrisPaul_G, KevinDurant_G, DerrickRose_G, DwyaneWade_G])

#Minutes Played
KobeBryant_MP = [3277, 3140, 3192, 2960, 2835, 2779, 2232, 3013, 177, 1207]
JoeJohnson_MP = [3340, 2359, 3343, 3124, 2886, 2554, 2127, 2642, 2575, 2791]
LeBronJames_MP = [3361, 3190, 3027, 3054, 2966, 3063, 2326, 2877, 2902, 2493]
CarmeloAnthony_MP = [2941, 2486, 2806, 2277, 2634, 2751, 1876, 2482, 2982, 1428]
DwightHoward_MP = [3021, 3023, 3088, 2821, 2843, 2935, 2070, 2722, 2396, 1223]
ChrisBosh_MP = [2751, 2658, 2425, 2928, 2526, 2795, 2007, 2454, 2531, 1556]
ChrisPaul_MP = [2808, 2353, 3006, 3002, 1712, 2880, 2181, 2335, 2171, 2857]
KevinDurant_MP = [1255, 1255, 2768, 2885, 3239, 3038, 2546, 3119, 3122, 913]
DerrickRose_MP = [1168, 1168, 1168, 3000, 2871, 3026, 1375, 0, 311, 1530]
DwyaneWade_MP = [2892, 1931, 1954, 3048, 2792, 2823, 1625, 2391, 1775, 1971]
#Matrix
MinutesPlayed = np.array([KobeBryant_MP, JoeJohnson_MP, LeBronJames_MP, CarmeloAnthony_MP, DwightHoward_MP, ChrisBosh_MP, ChrisPaul_MP, KevinDurant_MP, DerrickRose_MP, DwyaneWade_MP])

#Field Goals
KobeBryant_FG = [978, 813, 775, 800, 716, 740, 574, 738, 31, 266]
JoeJohnson_FG = [632, 536, 647, 620, 635, 514, 423, 445, 462, 446]
LeBronJames_FG = [875, 772, 794, 789, 768, 758, 621, 765, 767, 624]
CarmeloAnthony_FG = [756, 691, 728, 535, 688, 684, 441, 669, 743, 358]
DwightHoward_FG = [468, 526, 583, 560, 510, 619, 416, 470, 473, 251]
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ChrisBosh_FG = [549, 543, 507, 615, 600, 524, 393, 485, 492, 343]
ChrisPaul_FG = [407, 381, 630, 631, 314, 430, 425, 412, 406, 568]
KevinDurant_FG = [306, 306, 587, 661, 794, 711, 643, 731, 849, 238]
DerrickRose_FG = [208, 208, 208, 574, 672, 711, 302, 0, 58, 338]
DwyaneWade_FG = [699, 472, 439, 854, 719, 692, 416, 569, 415, 509]
#Matrix
FieldGoals = np.array([KobeBryant_FG, JoeJohnson_FG, LeBronJames_FG, CarmeloAnthony_FG])

#Field Goal Attempts
KobeBryant_FGA = [2173, 1757, 1690, 1712, 1569, 1639, 1336, 1595, 73, 713]
JoeJohnson_FGA = [1395, 1139, 1497, 1420, 1386, 1161, 931, 1052, 1018, 1025]
LeBronJames_FGA = [1823, 1621, 1642, 1613, 1528, 1485, 1169, 1354, 1353, 1279]
CarmeloAnthony_FGA = [1572, 1453, 1481, 1207, 1502, 1503, 1025, 1489, 1643, 806]
DwightHoward_FGA = [881, 873, 974, 979, 834, 1044, 726, 813, 800, 423]
ChrisBosh_FGA = [1087, 1094, 1027, 1263, 1158, 1056, 807, 907, 953, 745]
ChrisPaul_FGA = [947, 871, 1291, 1255, 637, 928, 890, 856, 870, 1170]
KevinDurant_FGA = [647, 647, 1366, 1390, 1668, 1538, 1297, 1433, 1688, 467]
DerrickRose_FGA = [436, 436, 436, 1208, 1373, 1597, 695, 0, 164, 835]
DwyaneWade_FGA = [1413, 962, 937, 1739, 1511, 1384, 837, 1093, 761, 1084]
#Matrix
FieldGoalAttempts = np.array([KobeBryant_FGA, JoeJohnson_FGA, LeBronJames_FGA, CarmeloAnthony_FGA])

#Points
KobeBryant PTS = [2832, 2430, 2323, 2201, 1970, 2078, 1616, 2133, 83, 782]
JoeJohnson PTS = [1653, 1426, 1779, 1688, 1619, 1312, 1129, 1170, 1245, 1154]
LeBronJames PTS = [2478, 2132, 2250, 2304, 2258, 2111, 1683, 2036, 2089, 1743]
CarmeloAnthony PTS = [2122, 1881, 1978, 1504, 1943, 1970, 1245, 1920, 2112, 966]
DwightHoward PTS = [1292, 1443, 1695, 1624, 1503, 1784, 1113, 1296, 1297, 646]
ChrisBosh PTS = [1572, 1561, 1496, 1746, 1678, 1438, 1025, 1232, 1281, 928]
ChrisPaul PTS = [1258, 1104, 1684, 1781, 841, 1268, 1189, 1186, 1185, 1564]
KevinDurant PTS = [903, 903, 1624, 1871, 2472, 2161, 1850, 2280, 2593, 686]
DerrickRose PTS = [597, 597, 597, 1361, 1619, 2026, 852, 0, 159, 904]
DwyaneWade PTS = [2040, 1397, 1254, 2386, 2045, 1941, 1082, 1463, 1028, 1331]
#Matrix
Points = np.array([KobeBryant PTS, JoeJohnson PTS, LeBronJames PTS, CarmeloAnthony PTS])

```

In [2]: Salary # salary Matrix

```

Out[2]: array([[15946875, 17718750, 19490625, 21262500, 23034375, 24806250,
   25244493, 27849149, 30453805, 23500000],
   [12000000, 12744189, 13488377, 14232567, 14976754, 16324500,
   18038573, 19752645, 21466718, 23180790],
   [ 4621800,  5828090, 13041250, 14410581, 15779912, 14500000,
   16022500, 17545000, 19067500, 20644400],
   [ 3713640,  4694041, 13041250, 14410581, 15779912, 17149243,
   18518574, 19450000, 22407474, 22458000],
   [ 4493160,  4806720, 6061274, 13758000, 15202590, 16647180,
   18091770, 19536360, 20513178, 21436271],
   [ 3348000,  4235220, 12455000, 14410581, 15779912, 14500000,
   16022500, 17545000, 19067500, 20644400],
   [ 3144240,  3380160, 3615960, 4574189, 13520500, 14940153,
   16359805, 17779458, 18668431, 20068563],
   [      0,      0, 4171200, 4484040, 4796880, 6053663,
   15506632, 16669630, 17832627, 18995624],
   [      0,      0, 4822800, 5184480, 5546160,
   6993708, 16402500, 17632688, 18862875],
   [ 3031920, 3841443, 13041250, 14410581, 15779912, 14200000,
   15691000, 17182000, 18673000, 15000000]])

```

In [3]: Games # Games matrix

Out[3]: array([[80, 77, 82, 82, 73, 82, 58, 78, 6, 35],  
 [82, 57, 82, 79, 76, 72, 60, 72, 79, 80],  
 [79, 78, 75, 81, 76, 79, 62, 76, 77, 69],  
 [80, 65, 77, 66, 69, 77, 55, 67, 77, 40],  
 [82, 82, 82, 79, 82, 78, 54, 76, 71, 41],  
 [70, 69, 67, 77, 70, 77, 57, 74, 79, 44],  
 [78, 64, 80, 78, 45, 80, 60, 70, 62, 82],  
 [35, 35, 80, 74, 82, 78, 66, 81, 81, 27],  
 [40, 40, 40, 81, 78, 81, 39, 0, 10, 51],  
 [75, 51, 51, 79, 77, 76, 49, 69, 54, 62]])

In [5]: Points # points Matrix

Out[5]: array([[2832, 2430, 2323, 2201, 1970, 2078, 1616, 2133, 83, 782],  
 [1653, 1426, 1779, 1688, 1619, 1312, 1129, 1170, 1245, 1154],  
 [2478, 2132, 2250, 2304, 2258, 2111, 1683, 2036, 2089, 1743],  
 [2122, 1881, 1978, 1504, 1943, 1970, 1245, 1920, 2112, 966],  
 [1292, 1443, 1695, 1624, 1503, 1784, 1113, 1296, 1297, 646],  
 [1572, 1561, 1496, 1746, 1678, 1438, 1025, 1232, 1281, 928],  
 [1258, 1104, 1684, 1781, 841, 1268, 1189, 1186, 1185, 1564],  
 [903, 903, 1624, 1871, 2472, 2161, 1850, 2280, 2593, 686],  
 [597, 597, 597, 1361, 1619, 2026, 852, 0, 159, 904],  
 [2040, 1397, 1254, 2386, 2045, 1941, 1082, 1463, 1028, 1331]])

In [7]: mydata=np.arange(0,20)  
 print(mydata)

[ 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19]

In [8]: np.reshape(mydata,(4,5))

Out[8]: array([[ 0, 1, 2, 3, 4],  
 [ 5, 6, 7, 8, 9],  
 [10, 11, 12, 13, 14],  
 [15, 16, 17, 18, 19]])

In [12]: mat1=np.reshape(mydata,(5,4),order='c')  
 mat1

Out[12]: array([[ 0, 1, 2, 3],  
 [ 4, 5, 6, 7],  
 [ 8, 9, 10, 11],  
 [12, 13, 14, 15],  
 [16, 17, 18, 19]])

In [13]: print(mat1)

[[ 0 1 2 3]  
 [ 4 5 6 7]  
 [ 8 9 10 11]  
 [12 13 14 15]  
 [16 17 18 19]]

mat1[4,3]

In [14]: mat1[4,3]

Out[14]: 19

```
In [15]: mat1[2,4]
```

**IndexError**

Input In [15], in <cell line: 1>()

----> 1 mat1[2,4]

Traceback (most recent call last)

**IndexError**: index 4 is out of bounds for axis 1 with size 4

```
mat1[3,3]
```

```
In [16]: mat1[3,3]
```

Out[16]: 15

```
In [17]: mat1
```

Out[17]: array([[ 0, 1, 2, 3],  
 [ 4, 5, 6, 7],  
 [ 8, 9, 10, 11],  
 [12, 13, 14, 15],  
 [16, 17, 18, 19]])

```
In [18]: mat1[3,3]
```

Out[18]: 15

```
In [19]: mat1[3,2]
```

Out[19]: 14

```
In [20]: mat1[1,2]
```

Out[20]: 6

```
In [21]: mat1[-3,-1]
```

Out[21]: 11

```
In [22]: mydata
```

Out[22]: array([ 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16,  
 17, 18, 19])

```
In [23]: mat2=np.reshape(mydata,(5,4),order='F')  
mat2
```

Out[23]: array([[ 0, 5, 10, 15],  
 [ 1, 6, 11, 16],  
 [ 2, 7, 12, 17],  
 [ 3, 8, 13, 18],  
 [ 4, 9, 14, 19]])

```
In [24]: mat2[0,2]
```

**TypeError**

Input In [24], in <cell line: 1>()
----> 1 mat2[0,2]

Traceback (most recent call last)

**TypeError**: 'numpy.ndarray' object is not callable

In [25]: mat2[0,2]

Out[25]: 10

In [26]: mat2[3,2]

Out[26]: 13

In [27]: mat2[3,1]

Out[27]: 8

In [28]: mat2

Out[28]: array([[ 0, 5, 10, 15],
 [ 1, 6, 11, 16],
 [ 2, 7, 12, 17],
 [ 3, 8, 13, 18],
 [ 4, 9, 14, 19]])

In [29]: mat2[1:2]

Out[29]: array([[ 1, 6, 11, 16]])

In [30]: mat2[1,2]

Out[30]: 11

In [31]: mat2[1:2] # if applying slising output will be the entire row

Out[31]: array([[ 1, 6, 11, 16]])

In [32]: mat2[-2,-1]

Out[32]: 18

In [33]: mat2[-3,-3]

Out[33]: 7

In [34]: mat3=np.reshape(mydata,(5,4),order='A')
mat3

Out[34]: array([[ 0, 1, 2, 3],
 [ 4, 5, 6, 7],
 [ 8, 9, 10, 11],
 [12, 13, 14, 15],
 [16, 17, 18, 19]])

```
In [35]: a1=['welcome','to','Datascience']
a2=['Required','Hard', 'work']
a3=[1,2,3]
```

```
In [36]: [a1,a2,a3]
```

```
Out[36]: [['welcome', 'to', 'Datascience'], ['Required', 'Hard', 'work'], [1, 2, 3]]
```

```
In [37]: np.array(a1,a2,a3)
```

**TypeError**

Traceback (most recent call last)

```
Input In [37], in <cell line: 1>()
----> 1 np.array(a1,a2,a3)
```

**TypeError**: array() takes from 1 to 2 positional arguments but 3 were given

```
In [38]: mat4=np.array(a1,a2,a3)
mat4
```

**TypeError**

Traceback (most recent call last)

```
Input In [38], in <cell line: 1>()
----> 1 mat4=np.array(a1,a2,a3)
      2 mat4
```

**TypeError**: array() takes from 1 to 2 positional arguments but 3 were given

```
In [39]: mat4=np.array([a1,a2,a3])
mat4
```

```
Out[39]: array([['welcome', 'to', 'Datascience'],
                 ['Required', 'Hard', 'work'],
                 ['1', '2', '3']], dtype='|<U11')
```

```
In [40]: Games
```

```
Out[40]: array([[80, 77, 82, 82, 73, 82, 58, 78, 6, 35],
                 [82, 57, 82, 79, 76, 72, 60, 72, 79, 80],
                 [79, 78, 75, 81, 76, 79, 62, 76, 77, 69],
                 [80, 65, 77, 66, 69, 77, 55, 67, 77, 40],
                 [82, 82, 82, 79, 82, 78, 54, 76, 71, 41],
                 [70, 69, 67, 77, 70, 77, 57, 74, 79, 44],
                 [78, 64, 80, 78, 45, 80, 60, 70, 62, 82],
                 [35, 35, 80, 74, 82, 78, 66, 81, 81, 27],
                 [40, 40, 40, 81, 78, 81, 39, 0, 10, 51],
                 [75, 51, 51, 79, 77, 76, 49, 69, 54, 62]])
```

```
In [41]: Games[0]
```

```
Out[41]: array([80, 77, 82, 82, 73, 82, 58, 78, 6, 35])
```

```
In [42]: Games[0,2]
```

```
Out[42]: 82
```

```
In [43]: Games[1:2]
```

```
In [43]: array([[82, 57, 82, 79, 76, 72, 60, 72, 79, 80]])
```

```
In [44]: Games[2]
```

```
Out[44]: array([79, 78, 75, 81, 76, 79, 62, 76, 77, 69])
```

```
In [45]: Games
```

```
Out[45]: array([[80, 77, 82, 82, 73, 82, 58, 78, 6, 35],
 [82, 57, 82, 79, 76, 72, 60, 72, 79, 80],
 [79, 78, 75, 81, 76, 79, 62, 76, 77, 69],
 [80, 65, 77, 66, 69, 77, 55, 67, 77, 40],
 [82, 82, 82, 79, 82, 78, 54, 76, 71, 41],
 [70, 69, 67, 77, 70, 77, 57, 74, 79, 44],
 [78, 64, 80, 78, 45, 80, 60, 70, 62, 82],
 [35, 35, 80, 74, 82, 78, 66, 81, 81, 27],
 [40, 40, 40, 81, 78, 81, 39, 0, 10, 51],
 [75, 51, 51, 79, 77, 76, 49, 69, 54, 62]])
```

```
In [46]: Pooints
```

NameError

Traceback (most recent call last)

```
Input In [46], in <cell line: 1>()
----> 1 Pooints
```

NameError: name 'Pooints' is not defined

```
In [47]: Points
```

```
Out[47]: array([[2832, 2430, 2323, 2201, 1970, 2078, 1616, 2133, 83, 782],
 [1653, 1426, 1779, 1688, 1619, 1312, 1129, 1170, 1245, 1154],
 [2478, 2132, 2250, 2304, 2258, 2111, 1683, 2036, 2089, 1743],
 [2122, 1881, 1978, 1504, 1943, 1970, 1245, 1920, 2112, 966],
 [1292, 1443, 1695, 1624, 1503, 1784, 1113, 1296, 1297, 646],
 [1572, 1561, 1496, 1746, 1678, 1438, 1025, 1232, 1281, 928],
 [1258, 1104, 1684, 1781, 841, 1268, 1189, 1186, 1185, 1564],
 [903, 903, 1624, 1871, 2472, 2161, 1850, 2280, 2593, 686],
 [597, 597, 597, 1361, 1619, 2026, 852, 0, 159, 904],
 [2040, 1397, 1254, 2386, 2045, 1941, 1082, 1463, 1028, 1331]])
```

```
In [48]: Points[0]
```

```
Out[48]: array([2832, 2430, 2323, 2201, 1970, 2078, 1616, 2133, 83, 782])
```

```
In [49]: Points[1:2]
```

```
Out[49]: array([[1653, 1426, 1779, 1688, 1619, 1312, 1129, 1170, 1245, 1154]])
```

```
In [50]: Points[2:5]
```

```
Out[50]: array([[2478, 2132, 2250, 2304, 2258, 2111, 1683, 2036, 2089, 1743],
 [2122, 1881, 1978, 1504, 1943, 1970, 1245, 1920, 2112, 966],
 [1292, 1443, 1695, 1624, 1503, 1784, 1113, 1296, 1297, 646]])
```

```
In [51]: Points[3,5]
```

```
Out[51]: 1970
```

In [52]: Points

```
Out[52]: array([[2832, 2430, 2323, 2201, 1970, 2078, 1616, 2133, 83, 782],  
                 [1653, 1426, 1779, 1688, 1619, 1312, 1129, 1170, 1245, 1154],  
                 [2478, 2132, 2250, 2304, 2258, 2111, 1683, 2036, 2089, 1743],  
                 [2122, 1881, 1978, 1504, 1943, 1970, 1245, 1920, 2112, 966],  
                 [1292, 1443, 1695, 1624, 1503, 1784, 1113, 1296, 1297, 646],  
                 [1572, 1561, 1496, 1746, 1678, 1438, 1025, 1232, 1281, 928],  
                 [1258, 1104, 1684, 1781, 841, 1268, 1189, 1186, 1185, 1564],  
                 [903, 903, 1624, 1871, 2472, 2161, 1850, 2280, 2593, 686],  
                 [597, 597, 597, 1361, 1619, 2026, 852, 0, 159, 904],  
                 [2040, 1397, 1254, 2386, 2045, 1941, 1082, 1463, 1028, 1331]])
```

In [53]: Points[1,5]

```
Out[53]: 1312
```

In [54]: Points[7,5]

```
Out[54]: 2161
```

In [55]: Points[6,1]

```
Out[55]: 1104
```

In [56]: Points[3:6]

```
Out[56]: array([[2122, 1881, 1978, 1504, 1943, 1970, 1245, 1920, 2112, 966],  
                 [1292, 1443, 1695, 1624, 1503, 1784, 1113, 1296, 1297, 646],  
                 [1572, 1561, 1496, 1746, 1678, 1438, 1025, 1232, 1281, 928]])
```

In [57]: Points[-6,-1]

```
Out[57]: 646
```

In [58]: Points

```
Out[58]: array([[2832, 2430, 2323, 2201, 1970, 2078, 1616, 2133, 83, 782],  
                 [1653, 1426, 1779, 1688, 1619, 1312, 1129, 1170, 1245, 1154],  
                 [2478, 2132, 2250, 2304, 2258, 2111, 1683, 2036, 2089, 1743],  
                 [2122, 1881, 1978, 1504, 1943, 1970, 1245, 1920, 2112, 966],  
                 [1292, 1443, 1695, 1624, 1503, 1784, 1113, 1296, 1297, 646],  
                 [1572, 1561, 1496, 1746, 1678, 1438, 1025, 1232, 1281, 928],  
                 [1258, 1104, 1684, 1781, 841, 1268, 1189, 1186, 1185, 1564],  
                 [903, 903, 1624, 1871, 2472, 2161, 1850, 2280, 2593, 686],  
                 [597, 597, 597, 1361, 1619, 2026, 852, 0, 159, 904],  
                 [2040, 1397, 1254, 2386, 2045, 1941, 1082, 1463, 1028, 1331]])
```

In [59]: Pdict['JoeJohnson']

```
Out[59]: 1
```

In [60]: Player

**NameError**

Input In [60], in <cell line: 1>()

----> 1 Player

Traceback (most recent call last)

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

In [61]: Pdict

```
{'KobeBryant': 0,
 'JoeJohnson': 1,
 'LeBronJames': 2,
 'CarmeloAnthony': 3,
 'DwightHoward': 4,
 'ChrisBosh': 5,
 'ChrisPaul': 6,
 'KevinDurant': 7,
 'DerrickRose': 8,
 'DwyaneWade': 9}
```

In [62]: print(Pdict)

```
{'KobeBryant': 0, 'JoeJohnson': 1, 'LeBronJames': 2, 'CarmeloAnthony': 3, 'DwightHoward': 4, 'ChrisBosh': 5, 'ChrisPaul': 6, 'KevinDurant': 7, 'DerrickRose': 8, 'DwyaneWade': 9}
```

In [63]: Pdict['DerrickRose']

Out[63]: 8

In [64]: Games[1]

Out[64]: array([82, 57, 82, 79, 76, 72, 60, 72, 79, 80])

In [65]: Games[8]

Out[65]: array([40, 40, 40, 81, 78, 81, 39, 0, 10, 51])

In [66]: Games[Pdict['DerrickRose']]

Out[66]: array([40, 40, 40, 81, 78, 81, 39, 0, 10, 51])

In [67]: Games[Pdict['JoeJohnson']]

Out[67]: array([82, 57, 82, 79, 76, 72, 60, 72, 79, 80])

In [68]: Games

```
Out[68]: array([[80, 77, 82, 82, 73, 82, 58, 78, 6, 35],
 [82, 57, 82, 79, 76, 72, 60, 72, 79, 80],
 [79, 78, 75, 81, 76, 79, 62, 76, 77, 69],
 [80, 65, 77, 66, 69, 77, 55, 67, 77, 40],
 [82, 82, 82, 79, 82, 78, 54, 76, 71, 41],
 [70, 69, 67, 77, 70, 77, 57, 74, 79, 44],
 [78, 64, 80, 78, 45, 80, 60, 70, 62, 82],
 [35, 35, 80, 74, 82, 78, 66, 81, 81, 27],
 [40, 40, 40, 81, 78, 81, 39, 0, 10, 51],
 [75, 51, 51, 79, 77, 76, 49, 69, 54, 62]])
```

In [69]: `print(Pdict)`

```
{'KobeBryant': 0, 'JoeJohnson': 1, 'LeBronJames': 2, 'CarmeloAnthony': 3, 'DwightHoward': 4, 'ChrisBosh': 5, 'ChrisPaul': 6, 'KevinDurant': 7, 'DerrickRose': 8, 'Dwyane Wade': 9}
```

In [70]: `Games[Pdict['DwightHoward']]`

```
Out[70]: array([82, 82, 82, 79, 82, 78, 54, 76, 71, 41])
```

In [71]: `Points[Pdict['DerrickRose']]`

```
Out[71]: array([ 597,  597,  597, 1361, 1619, 2026,  852,    0,  159,  904])
```

In [72]: `Points`

```
Out[72]: array([[2832, 2430, 2323, 2201, 1970, 2078, 1616, 2133,   83,  782],
 [1653, 1426, 1779, 1688, 1619, 1312, 1129, 1170, 1245, 1154],
 [2478, 2132, 2250, 2304, 2258, 2111, 1683, 2036, 2089, 1743],
 [2122, 1881, 1978, 1504, 1943, 1970, 1245, 1920, 2112, 966],
 [1292, 1443, 1695, 1624, 1503, 1784, 1113, 1296, 1297, 646],
 [1572, 1561, 1496, 1746, 1678, 1438, 1025, 1232, 1281, 928],
 [1258, 1104, 1684, 1781, 841, 1268, 1189, 1186, 1185, 1564],
 [ 903,  903, 1624, 1871, 2472, 2161, 1850, 2280, 2593, 686],
 [ 597,  597,  597, 1361, 1619, 2026,  852,    0,  159,  904],
 [2040, 1397, 1254, 2386, 2045, 1941, 1082, 1463, 1028, 1331]])
```

In [73]: `Salary`

```
Out[73]: array([[15946875, 17718750, 19490625, 21262500, 23034375, 24806250,
 25244493, 27849149, 30453805, 23500000],
 [12000000, 12744189, 13488377, 14232567, 14976754, 16324500,
 18038573, 19752645, 21466718, 23180790],
 [ 4621800, 5828090, 13041250, 14410581, 15779912, 14500000,
 16022500, 17545000, 19067500, 20644400],
 [ 3713640, 4694041, 13041250, 14410581, 15779912, 17149243,
 18518574, 19450000, 22407474, 22458000],
 [ 4493160, 4806720, 6061274, 13758000, 15202590, 16647180,
 18091770, 19536360, 20513178, 21436271],
 [ 3348000, 4235220, 12455000, 14410581, 15779912, 14500000,
 16022500, 17545000, 19067500, 20644400],
 [ 3144240, 3380160, 3615960, 4574189, 13520500, 14940153,
 16359805, 17779458, 18668431, 20068563],
 [      0,       0, 4171200, 4484040, 4796880, 6053663,
 15506632, 16669630, 17832627, 18995624],
 [      0,       0,       0, 4822800, 5184480, 5546160,
 6993708, 16402500, 17632688, 18862875],
 [ 3031920, 3841443, 13041250, 14410581, 15779912, 14200000,
 15691000, 17182000, 18673000, 15000000]])
```

In [74]: `Salary[Pdict['CarmeloAnthony']]`

```
Out[74]: array([ 3713640, 4694041, 13041250, 14410581, 15779912, 17149243,
 18518574, 19450000, 22407474, 22458000])
```

In [75]: `Salary[Pdict['CarmeloAnthony']][Sdict['2009']]`

```
Out[75]: 15779912
```

```
In [76]: Salary[Pdict['CarmeloAnthony']][Sdict['2005']]
```

```
Out[76]: 3713640
```

```
In [77]: Games[Pdict['CarmeloAnthony']][Sdict['2005']]
```

```
Out[77]: 80
```

```
In [78]: Games[Pdict['CarmeloAnthony']][Sdict['2007']]
```

```
Out[78]: 77
```

```
In [79]: np.round(FieldGoals/Games)
```

```
C:\Users\G C Education\AppData\Local\Temp\ipykernel_5124\3814046495.py:1: RuntimeWarning: invalid value encountered in true_divide
    np.round(FieldGoals/Games)
```

```
Out[79]: array([[12., 11., 9., 10., 10., 9., 10., 9., 5., 8.],
   [8., 9., 8., 8., 8., 7., 7., 6., 6., 6.],
   [11., 10., 11., 10., 10., 10., 10., 10., 10., 9.],
   [9., 11., 9., 8., 10., 9., 8., 10., 10., 9.],
   [6., 6., 7., 7., 6., 8., 8., 6., 7., 6.],
   [8., 8., 8., 8., 9., 7., 7., 7., 6., 8.],
   [5., 6., 8., 8., 7., 5., 7., 6., 7., 7.],
   [9., 9., 7., 9., 10., 9., 10., 9., 10., 9.],
   [5., 5., 5., 7., 9., 9., 8., nan, 6., 7.],
   [9., 9., 9., 11., 9., 9., 8., 8., 8., 8.]])
```

```
In [80]: import warnings
warnings.filterwarnings('ignore')
```

```
In [81]: import numpy as np
import matplotlib.pyplot as plt
```

```
In [82]: %matplotlib inline
```

```
In [83]: Salary
```

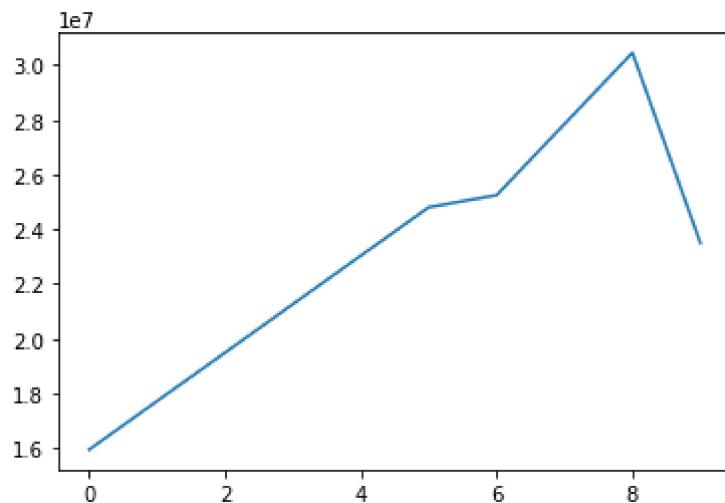
```
Out[83]: array([[15946875, 17718750, 19490625, 21262500, 23034375, 24806250,
   25244493, 27849149, 30453805, 23500000],
   [12000000, 12744189, 13488377, 14232567, 14976754, 16324500,
   18038573, 19752645, 21466718, 23180790],
   [ 4621800, 5828090, 13041250, 14410581, 15779912, 14500000,
   16022500, 17545000, 19067500, 20644400],
   [ 3713640, 4694041, 13041250, 14410581, 15779912, 17149243,
   18518574, 19450000, 22407474, 22458000],
   [ 4493160, 4806720, 6061274, 13758000, 15202590, 16647180,
   18091770, 19536360, 20513178, 21436271],
   [ 3348000, 4235220, 12455000, 14410581, 15779912, 14500000,
   16022500, 17545000, 19067500, 20644400],
   [ 3144240, 3380160, 3615960, 4574189, 13520500, 14940153,
   16359805, 17779458, 18668431, 20068563],
   [ 0, 0, 4171200, 4484040, 4796880, 6053663,
   15506632, 16669630, 17832627, 18995624],
   [ 0, 0, 0, 4822800, 5184480, 5546160,
   6993708, 16402500, 17632688, 18862875],
   [ 3031920, 3841443, 13041250, 14410581, 15779912, 14200000,
   15691000, 17182000, 18673000, 15000000]])
```

In [84]: `Salary[0]`

```
Out[84]: array([15946875, 17718750, 19490625, 21262500, 23034375, 24806250,
   25244493, 27849149, 30453805, 23500000])
```

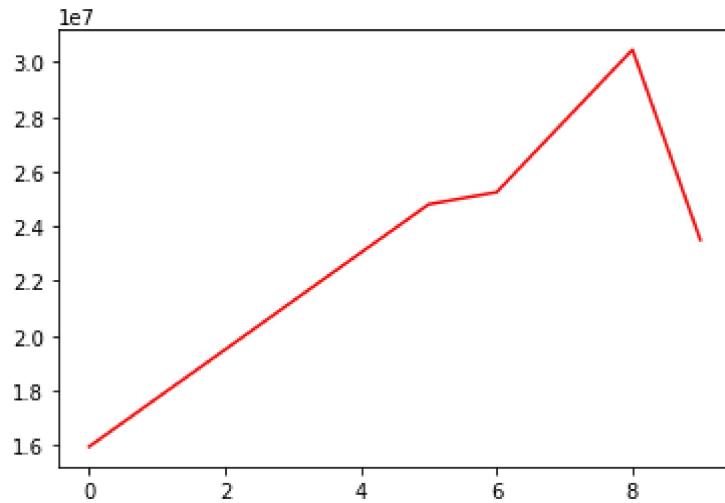
In [85]: `plt.plot(Salary[0])`

```
Out[85]: [<matplotlib.lines.Line2D at 0x1d3faaacfa0>]
```



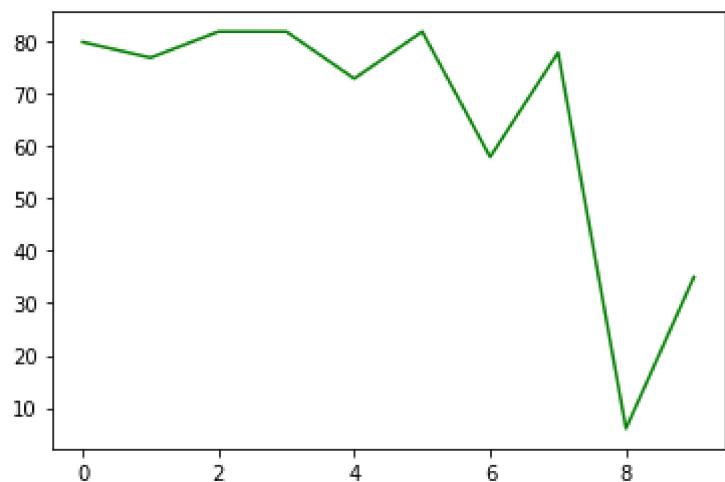
In [87]: `plt.plot(Salary[0], c='r')`

```
Out[87]: [<matplotlib.lines.Line2D at 0x1d3fabc2580>]
```



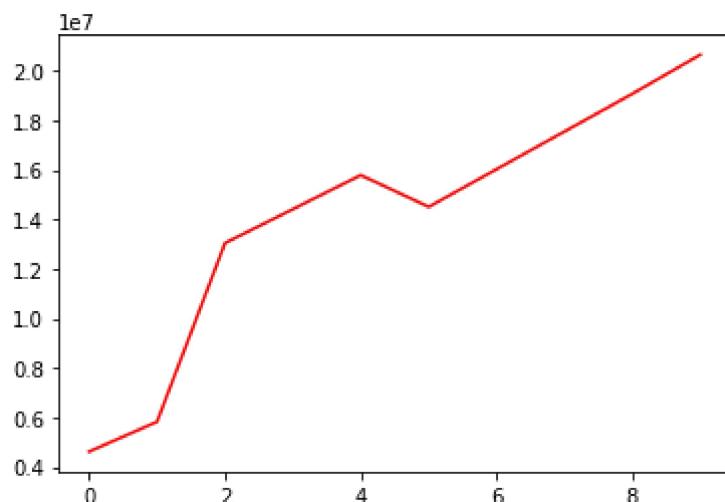
```
In [88]: plt.plot(Games[0],c='g')
```

```
Out[88]: []
```

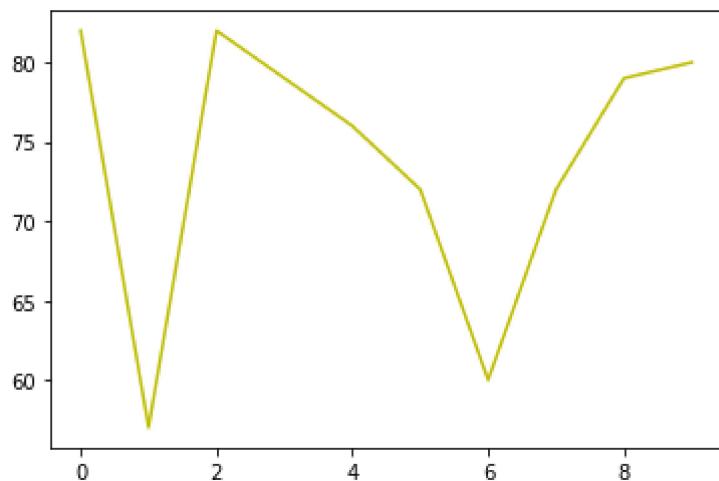
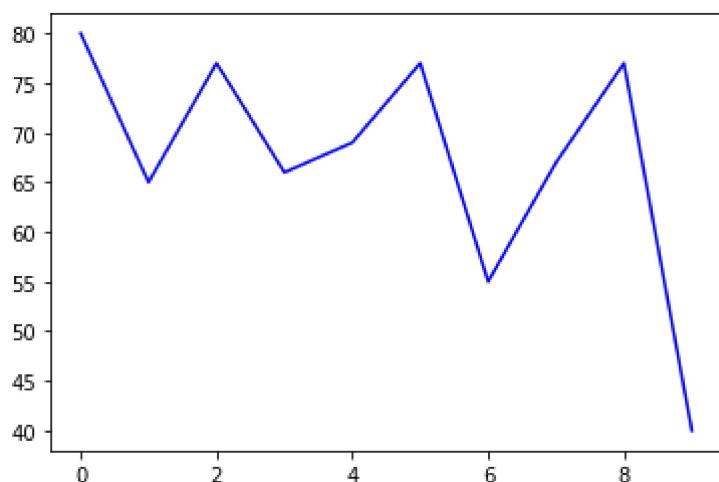


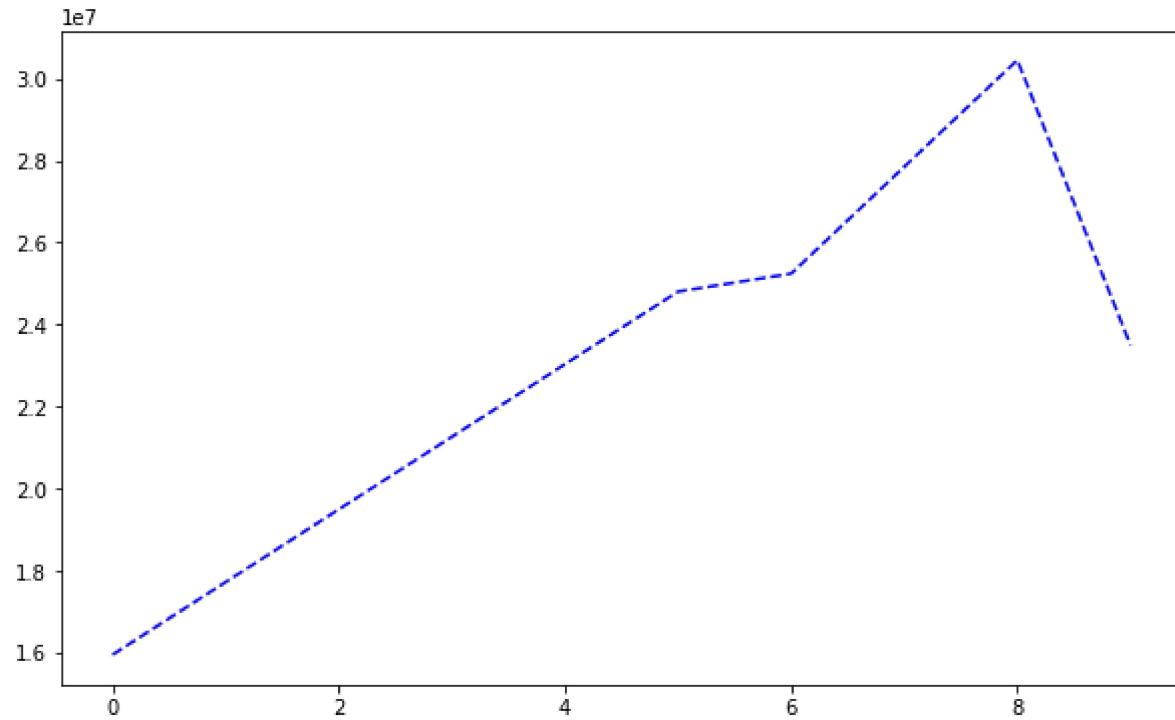
```
In [90]: plt.plot(Salary[2],c='r')
```

```
Out[90]: []
```

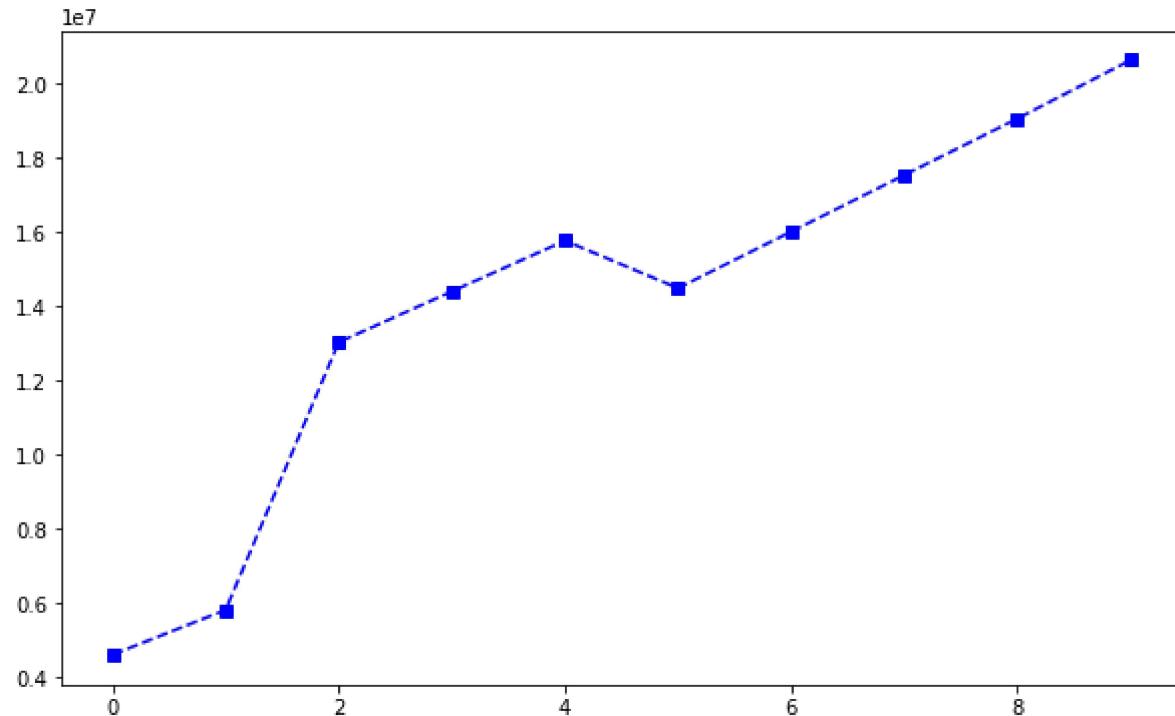


```
In [91]: plt.plot(Games[1],c='y')
```

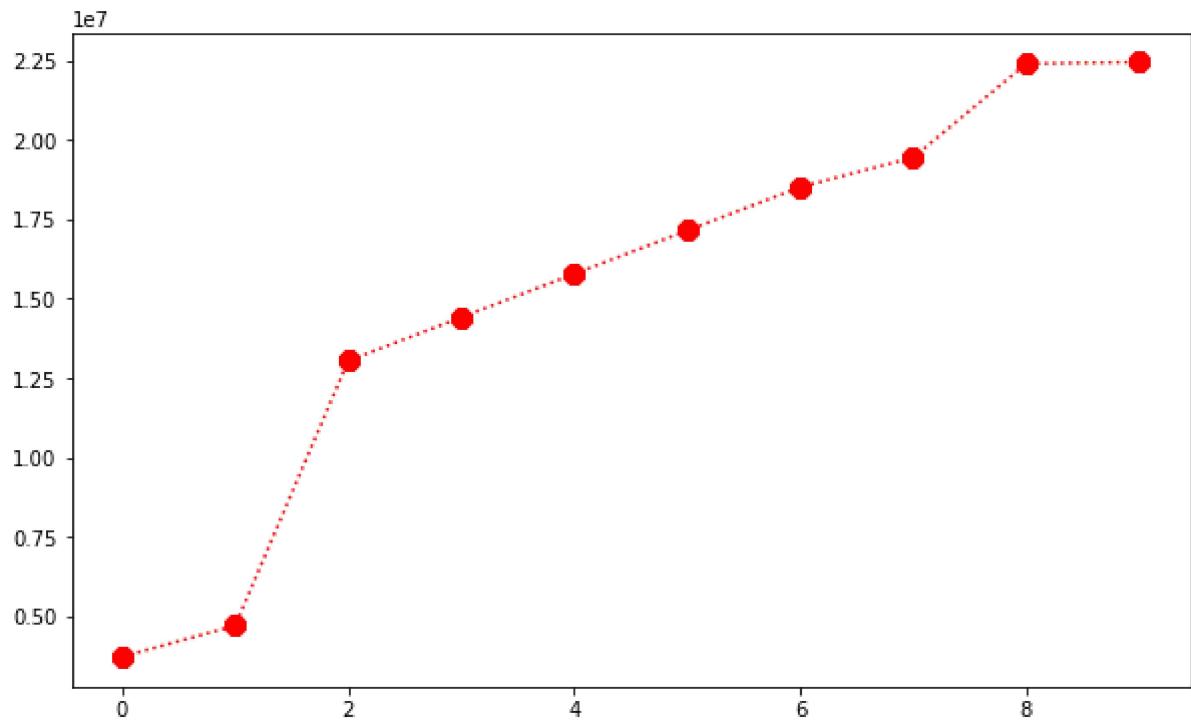
Out[91]: [`<matplotlib.lines.Line2D at 0x1d3fad50e20>`]In [94]: `plt.plot(Games[3], c='b')`Out[94]: [`<matplotlib.lines.Line2D at 0x1d3fbe568b0>`]In [95]: `%matplotlib inline`  
`plt.rcParams['figure.figsize']=10,6`In [97]: `plt.plot(Salary[0], c='b', ls='--')`Out[97]: [`<matplotlib.lines.Line2D at 0x1d3fbec24f0>`]



```
In [102]: plt.plot(Salary[2],c='b',ls='--',marker='s') # ls = Line style, marker = 's', 's' means  
Out[102]: <matplotlib.lines.Line2D at 0x1d3ff5ecf10>
```



```
In [106]: plt.plot(Salary[3],c='r',ls=':',marker='8',ms=10)  
Out[106]: <matplotlib.lines.Line2D at 0x1d3ff410b50>
```



```
In [107]: list(range(0,10))
```

```
Out[107]: [0, 1, 2, 3, 4, 5, 6, 7, 8, 9]
```

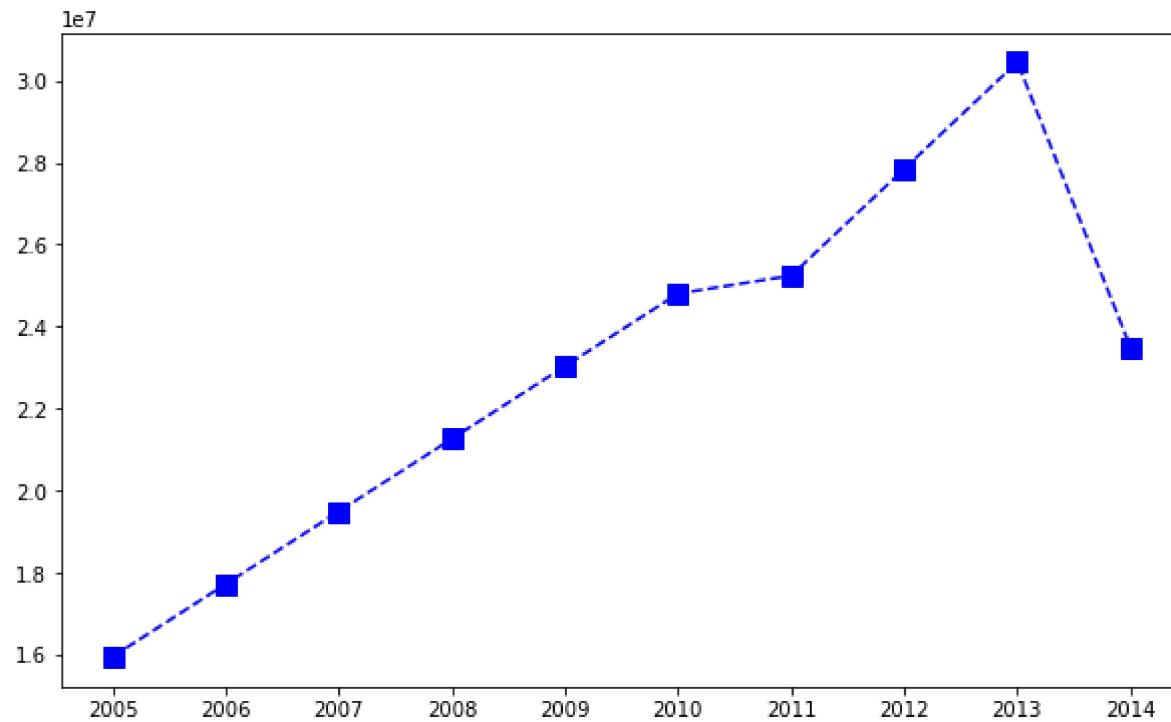
```
In [108]: sdict
```

```
NameError                                 Traceback (most recent call last)
Input In [108], in <cell line: 1>()
      1 sdict
NameError: name 'sdict' is not defined
```

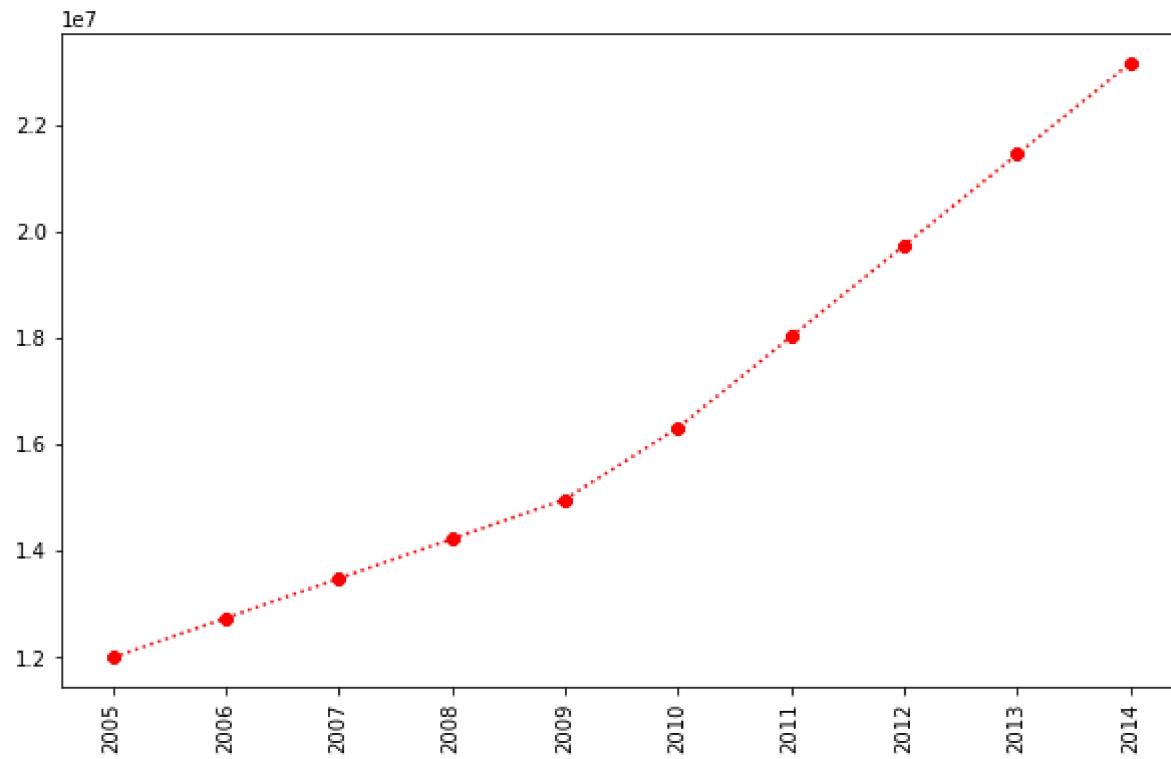
```
In [109]: Sdict
```

```
Out[109]: {'2005': 0,
           '2006': 1,
           '2007': 2,
           '2008': 3,
           '2009': 4,
           '2010': 5,
           '2011': 6,
           '2012': 7,
           '2013': 8,
           '2014': 9}
```

```
In [110]: plt.plot(Salary[0],c='b',ls='--',marker='s',ms=10)
plt.xticks(list(range(0,10)),Seasons)
plt.show()
```



```
In [113]: plt.plot(Salary[1],c='r',ls=':',marker='8',ms=7, label=Players[1])
plt.xticks(list(range(0,10)),Seasons,rotation='vertical')
plt.show()
```



```
In [ ]:
```