

```
In [2]: import numpy as np

#Seasons
Seasons = ["2015","2016","2017","2018","2019","2020","2021","2022","2023","2024"]
Sdict = {"2015":0,"2016":1,"2017":2,"2018":3,"2019":4,"2020":5,"2021":6,"2022":7

#Players
Players = ["Sachin","Rahul","Smith","Sami","Pollard","Morris","Samson","Dhoni","P"]
Pdict = {"Sachin":0,"Rahul":1,"Smith":2,"Sami":3,"Pollard":4,"Morris":5,"Samson":6

#Salaries
Sachin_Salary = [15946875,17718750,19490625,21262500,23034375,24806250,25244493,
Rahul_Salary = [12000000,12744189,13488377,14232567,14976754,16324500,18038573,1
Smith_Salary = [4621800,5828090,13041250,14410581,15779912,14500000,16022500,175
Sami_Salary = [3713640,4694041,13041250,14410581,15779912,17149243,18518574,1945
Pollard_Salary = [4493160,4806720,6061274,13758000,15202590,16647180,18091770,19
Morris_Salary = [3348000,4235220,12455000,14410581,15779912,14500000,16022500,17
Samson_Salary = [3144240,3380160,3615960,4574189,13520500,14940153,16359805,1777
Dhoni_Salary = [0,0,4171200,4484040,4796880,6053663,15506632,16669630,17832627,1
Kohli_Salary = [0,0,0,4822800,5184480,5546160,6993708,16402500,17632688,18862875
Sky_Salary = [3031920,3841443,13041250,14410581,15779912,14200000,15691000,17182
#Matrix
Salary = np.array([Sachin_Salary, Rahul_Salary, Smith_Salary, Sami_Salary, Polla

#Games
Sachin_G = [80,77,82,82,73,82,58,78,6,35]
Rahul_G = [82,57,82,79,76,72,60,72,79,80]
Smith_G = [79,78,75,81,76,79,62,76,77,69]
Sami_G = [80,65,77,66,69,77,55,67,77,40]
Pollard_G = [82,82,82,79,82,78,54,76,71,41]
Morris_G = [70,69,67,77,70,77,57,74,79,44]
Samson_G = [78,64,80,78,45,80,60,70,62,82]
Dhoni_G = [35,35,80,74,82,78,66,81,81,27]
Kohli_G = [40,40,40,81,78,81,39,0,10,51]
Sky_G = [75,51,51,79,77,76,49,69,54,62]
#Matrix
Games = np.array([Sachin_G, Rahul_G, Smith_G, Sami_G, Pollard_G, Morris_G, Samso

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

```
In [43]: import matplotlib.pyplot as plt
```

```
In [3]: Salary
```

```
Out[3]: 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 [4]: Games

```
Out[4]: 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

```
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 [6]: Games

```
Out[6]: 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 [7]: Games[5]
```

```
Out[7]: array([70, 69, 67, 77, 70, 77, 57, 74, 79, 44])
```

```
In [8]: Games[0:5]
```

```
Out[8]: 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]])
```

```
In [10]: Games[0,5]
```

```
Out[10]: 82
```

```
In [11]: Games[0,2]
```

```
Out[11]: 82
```

```
In [12]: Games[1:2]
```

```
Out[12]: array([[82, 57, 82, 79, 76, 72, 60, 72, 79, 80]])
```

```
In [13]: Games
```

```
Out[13]: 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 [15]: Games[-3:-1]
```

```
Out[15]: array([[35, 35, 80, 74, 82, 78, 66, 81, 81, 27],  
                [40, 40, 40, 81, 78, 81, 39, 0, 10, 51]])
```

```
In [16]: Games[-3,-1]
```

```
Out[16]: 27
```

```
In [18]: Points
```

```
Out[18]: 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 [19]: Games
```

```
Out[19]: 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 [21]: Pdict
```

```
Out[21]: {'Sachin': 0,  
'Rahul': 1,  
'Smith': 2,  
'Sami': 3,  
'Pollard': 4,  
'Morris': 5,  
'Samson': 6,  
'Dhoni': 7,  
'Kohli': 8,  
'Sky': 9}
```

```
In [22]: Pdict['Sachin']
```

```
Out[22]: 0
```

```
In [24]: Games
```

```
Out[24]: 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 [23]: Games[0]
```

```
Out[23]: array([80, 77, 82, 82, 73, 82, 58, 78, 6, 35])
```

```
In [25]: Games[Pdict['Sachin']]
```

```
Out[25]: array([80, 77, 82, 82, 73, 82, 58, 78, 6, 35])
```

```
In [26]: Games
```

```
Out[26]: 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 [28]: Pdict['Rahul']
```

```
Out[28]: 1
```

```
In [30]: Games[1]
```

```
Out[30]: array([82, 57, 82, 79, 76, 72, 60, 72, 79, 80])
```

```
In [31]: Points
```

```
Out[31]: 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 [32]: Salary
```

```
Out[32]: 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 [33]: Salary/Games
```

```
C:\Users\arati\AppData\Local\Temp\ipykernel_7088\3709746658.py:1: RuntimeWarning:  
divide by zero encountered in divide  
    Salary/Games
```

```
Out[33]: array([[ 199335.9375 ,  230113.63636364,  237690.54878049,  
   259298.7804878 ,  315539.38356164,  302515.24390244,  
   435249.87931034,  357040.37179487,  5075634.16666667,  
   671428.57142857],  
[[ 146341.46341463,  223582.26315789,  164492.40243902,  
   180159.07594937,  197062.55263158,  226729.16666667,  
   300642.88333333,  274342.29166667,  271730.60759494,  
   289759.875     ],  
[[ 58503.79746835,  74719.1025641 ,  173883.33333333,  
   177908.40740741,  207630.42105263,  183544.30379747,  
   258427.41935484,  230855.26315789,  247629.87012987,  
   299194.20289855],  
[[ 46420.5       ,  72216.01538462,  169366.88311688,  
   218342.13636364,  228694.37681159,  222717.44155844,  
   336701.34545455,  290298.50746269,  291006.15584416,  
   561450.        ],  
[[ 54794.63414634,  58618.53658537,  73917.97560976,  
   174151.89873418,  185397.43902439,  213425.38461538,  
   335032.77777778,  257057.36842105,  288918.        ,  
   522835.87804878],  
[[ 47828.57142857,  61380.        ,  185895.52238806,  
   187150.4025974 ,  225427.31428571,  188311.68831169,  
   281096.49122807,  237094.59459459,  241360.75949367,  
   469190.90909091],  
[[ 40310.76923077,  52815.        ,  45199.5        ,  
   58643.44871795,  300455.55555556,  186751.9125        ,  
   272663.41666667,  253992.25714286,  301103.72580645,  
   244738.57317073],  
[[ 0.        ,  0.        ,  52140.        ,  
   60595.13513514,  58498.53658537,  77611.06410256,  
   234948.96969697,  205797.90123457,  220155.88888889,  
   703541.62962963],  
[[ 0.        ,  0.        ,  0.        ,  
   59540.74074074,  66467.69230769,  68471.11111111,  
   179325.84615385,  inf,  1763268.8        ,  
   369860.29411765],  
[[ 40425.6       ,  75322.41176471,  255710.78431373,  
   182412.41772152,  204933.92207792,  186842.10526316,  
   320224.48979592,  249014.49275362,  345796.2962963 ,  
   241935.48387097]])
```

```
In [35]: np.round(Salary/Games)
```

```
C:\Users\arati\AppData\Local\Temp\ipykernel_7088\3232172828.py:1: RuntimeWarning:  
divide by zero encountered in divide  
    np.round(Salary/Games)
```

```
Out[35]: array([[ 199336.,  230114.,  237691.,  259299.,  315539.,  302515.,
   435250.,  357040.,  5075634.,  671429.],
   [ 146341.,  223582.,  164492.,  180159.,  197063.,  226729.,
   300643.,  274342.,  271731.,  289760.],
   [ 58504.,  74719.,  173883.,  177908.,  207630.,  183544.,
   258427.,  230855.,  247630.,  299194.],
   [ 46420.,  72216.,  169367.,  218342.,  228694.,  222717.,
   336701.,  290299.,  291006.,  561450.],
   [ 54795.,  58619.,  73918.,  174152.,  185397.,  213425.,
   335033.,  257057.,  288918.,  522836.],
   [ 47829.,  61380.,  185896.,  187150.,  225427.,  188312.,
   281096.,  237095.,  241361.,  469191.],
   [ 40311.,  52815.,  45200.,  58643.,  300456.,  186752.,
   272663.,  253992.,  301104.,  244739.],
   [ 0.,  0.,  52140.,  60595.,  58499.,  77611.,
   234949.,  205798.,  220156.,  703542.],
   [ 0.,  0.,  0.,  59541.,  66468.,  68471.,
   179326.,  inf,  1763269.,  369860.],
   [ 40426.,  75322.,  255711.,  182412.,  204934.,  186842.,
   320224.,  249014.,  345796.,  241935.]])
```

```
In [36]: import warning
warning.filterwarnings('ignore')
```

```
-----  
ModuleNotFoundError                       Traceback (most recent call last)
Cell In[36], line 1
----> 1 import warning
      2 warning.filterwarnings('ignore')

ModuleNotFoundError: No module named 'warning'
```

```
In [ ]:
```

```
In [ ]: import matplotlib.pyplot as plt
```

```
In [37]: %matplotlib inline
```

```
In [38]: Salary
```

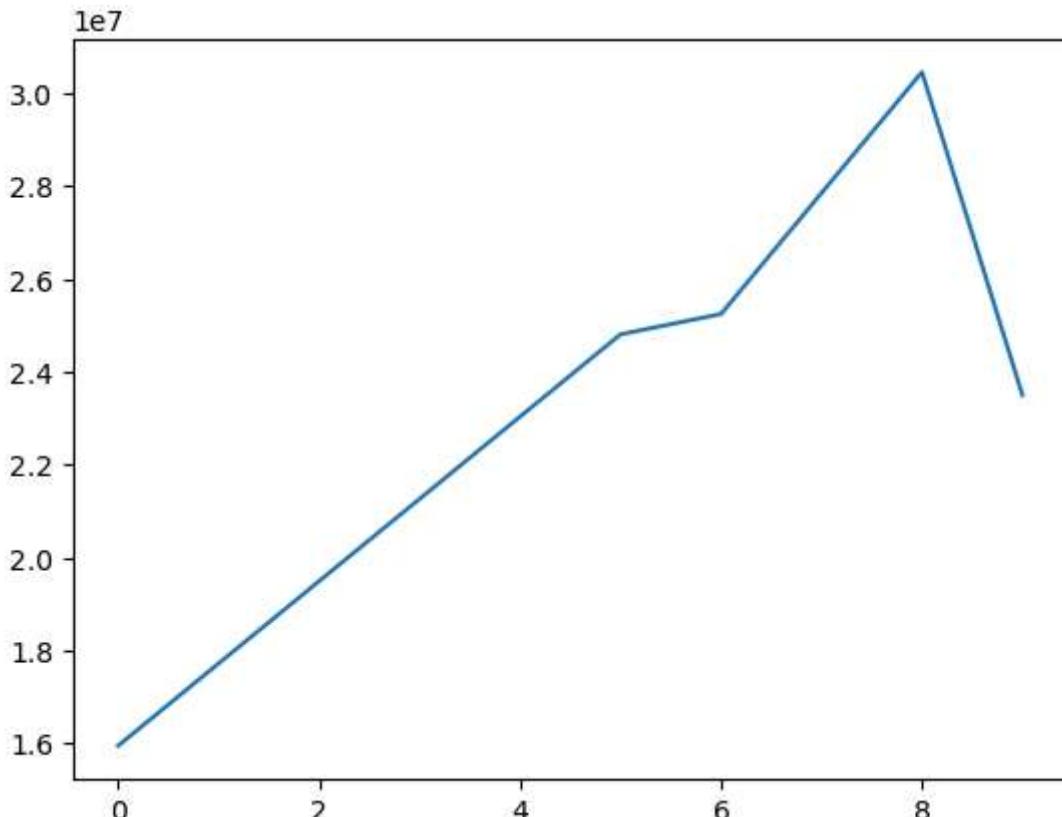
```
Out[38]: array([[15946875, 17718750, 19490625, 21262500, 23034375, 24806250,
   25244493, 27849149, 30453805, 23500000],
   [12000000, 12744189, 13488377, 14232567, 14976754, 16324500,
   18038573, 19752645, 21466718, 23180790],
   [ 4621800,  5828090, 13041250, 14410581, 15779912, 14500000,
  16022500, 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 [39]: Salary[0]
```

```
Out[39]: array([15946875, 17718750, 19490625, 21262500, 23034375, 24806250,
   25244493, 27849149, 30453805, 23500000])
```

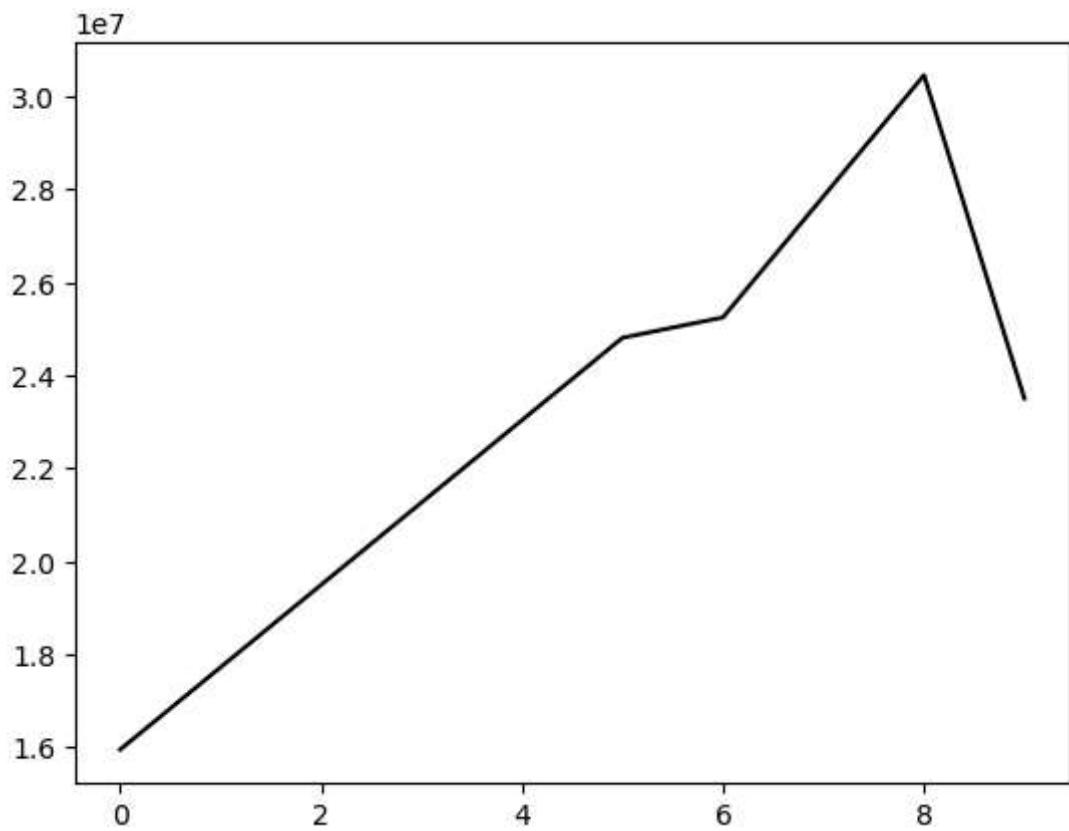
```
In [44]: plt.plot(Salary[0])
```

```
Out[44]: [
```



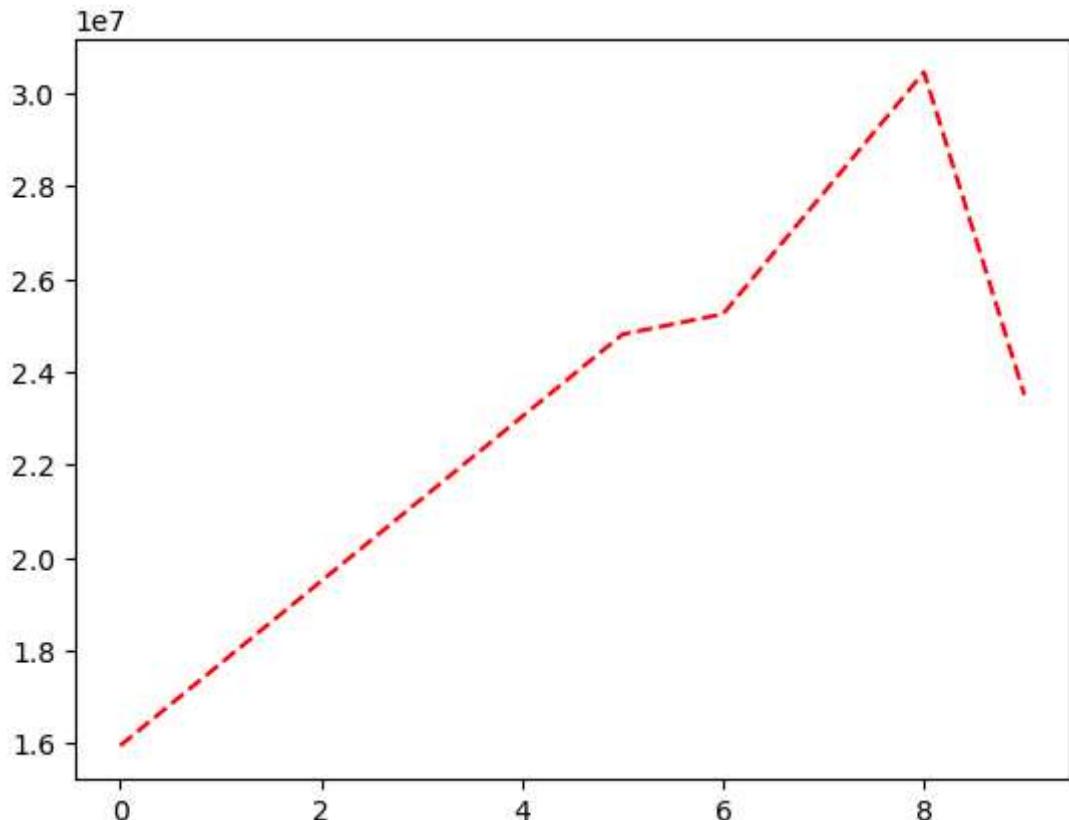
```
In [48]: plt.plot(Salary[0], color='k')
```

```
Out[48]: [
```



```
In [50]: plt.plot(Salary[0], color='red', ls='--')
```

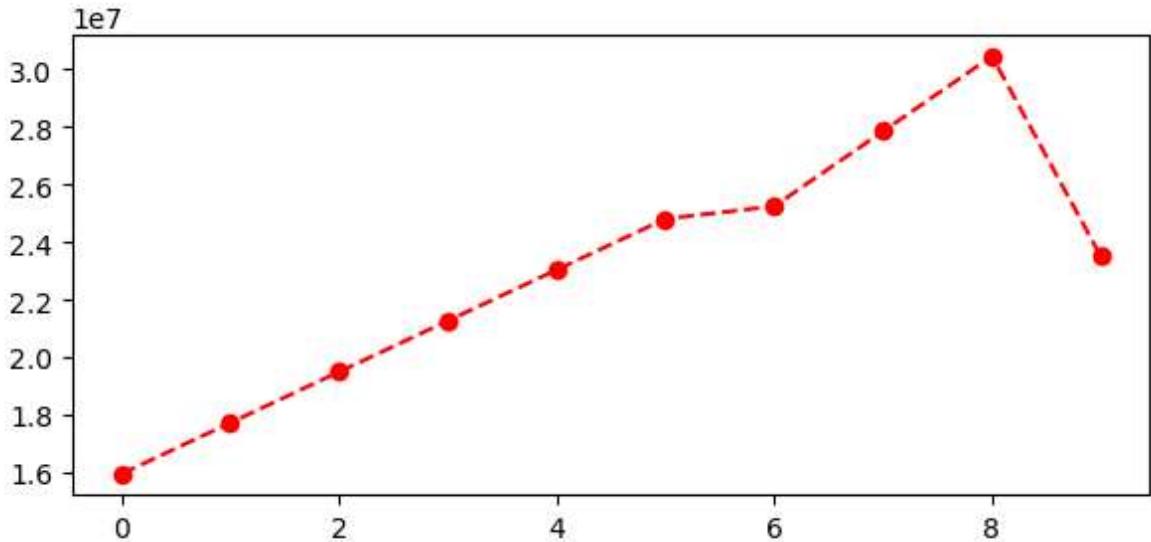
```
Out[50]: [
```



```
In [58]: %matplotlib inline  
plt.rcParams['figure.figsize']=7,3
```

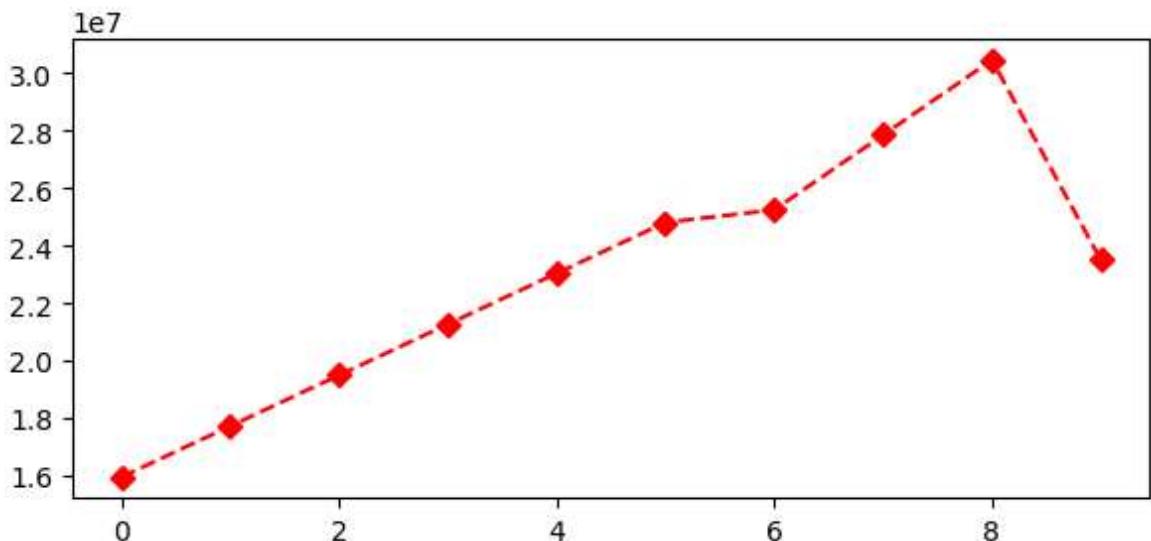
```
In [55]: plt.plot(Salary[0],color='red',ls='--',marker='o')
```

```
Out[55]: <matplotlib.lines.Line2D at 0x234fa4911f0>
```

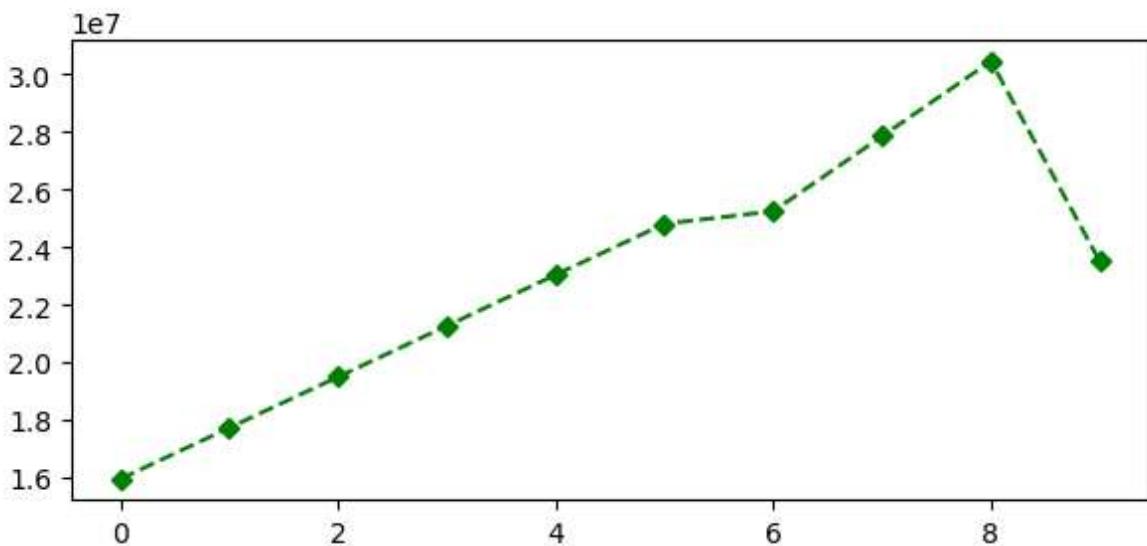


```
In [56]: plt.plot(Salary[0],color='red',ls='--',marker='D')
```

```
Out[56]: <matplotlib.lines.Line2D at 0x234fa412ed0>
```



```
In [60]: plt.plot(Salary[0],color='green',ls='--',marker='D',ms=5)  
plt.show()
```



```
In [62]: list(range(0,10))
```

```
Out[62]: [0, 1, 2, 3, 4, 5, 6, 7, 8, 9]
```

```
In [63]: Sdict
```

```
Out[63]: {'2015': 0,
           '2016': 1,
           '2017': 2,
           '2018': 3,
           '2019': 4,
           '2020': 5,
           '2021': 6,
           '2022': 7,
           '2023': 8,
           '2024': 9}
```

```
In [64]: Pdict
```

```
Out[64]: {'Sachin': 0,
           'Rahul': 1,
           'Smith': 2,
           'Sami': 3,
           'Pollard': 4,
           'Morris': 5,
           'Samson': 6,
           'Dhoni': 7,
           'Kohli': 8,
           'Sky': 9}
```

```
In [ ]: import matplotlib.pyplot as plt
%matplotlib inline
```

```
In [9]: import numpy as np
```

```
#Seasons
Seasons = ["2015","2016","2017","2018","2019","2020","2021","2022","2023","2024"]
Sdict = {"2015":0,"2016":1,"2017":2,"2018":3,"2019":4,"2020":5,"2021":6,"2022":7

#Players
Players = ["Sachin","Rahul","Smith","Sami","Pollard","Morris","Samson","Dhoni",""
```

```

Pdict = {"Sachin":0,"Rahul":1,"Smith":2,"Sami":3,"Pollard":4,"Morris":5,"Samson":6}

#Salaries
Sachin_Salary = [15946875,17718750,19490625,21262500,23034375,24806250,25244493,26000000,2744189,288377,29232567,2976754,3034500,30838573,3121800,3282090,33041250,34410581,35779912,36500000,37022500,375,3713640,3894041,39041250,39410581,39779912,39149243,39518574,3945,39493160,39806720,39061274,39758000,39502590,396647180,398091770,399,39348000,39235220,392455000,394410581,395779912,394500000,396022500,397,393144240,39380160,393615960,394574189,3943520500,394940153,3916359805,391777,394796800,396053663,3915506632,3916669630,3917832627,391,3940,392171200,394484040,39479680,396053663,3915506632,3916669630,3917832627,391,394222800,395184480,395546160,3966993708,39616402500,39617632688,39618862875,3963031920,3963841443,3963041250,39634410581,39635779912,39634200000,396315691000,396317182,3963#Matrix
Salary = np.array([Sachin_Salary, Rahul_Salary, Smith_Salary, Sami_Salary, Pollard_Salary, Morris_Salary, Samson_Salary])

#Games
Sachin_G = [80,77,82,82,73,82,58,78,6,35]
Rahul_G = [82,57,82,79,76,72,60,72,79,80]
Smith_G = [79,78,75,81,76,79,62,76,77,69]
Sami_G = [80,65,77,66,69,77,55,67,77,40]
Pollard_G = [82,82,82,79,82,78,54,76,71,41]
Morris_G = [70,69,67,77,70,77,57,74,79,44]
Samson_G = [78,64,80,78,45,80,60,70,62,82]
Dhoni_G = [35,35,80,74,82,78,66,81,81,27]
Kohli_G = [40,40,40,81,78,81,39,0,10,51]
Sky_G = [75,51,51,79,77,76,49,69,54,62]
#Matrix
Games = np.array([Sachin_G, Rahul_G, Smith_G, Sami_G, Pollard_G, Morris_G, Samson_G])

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

```

In [10]: Salary

```
Out[10]: 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]])
```

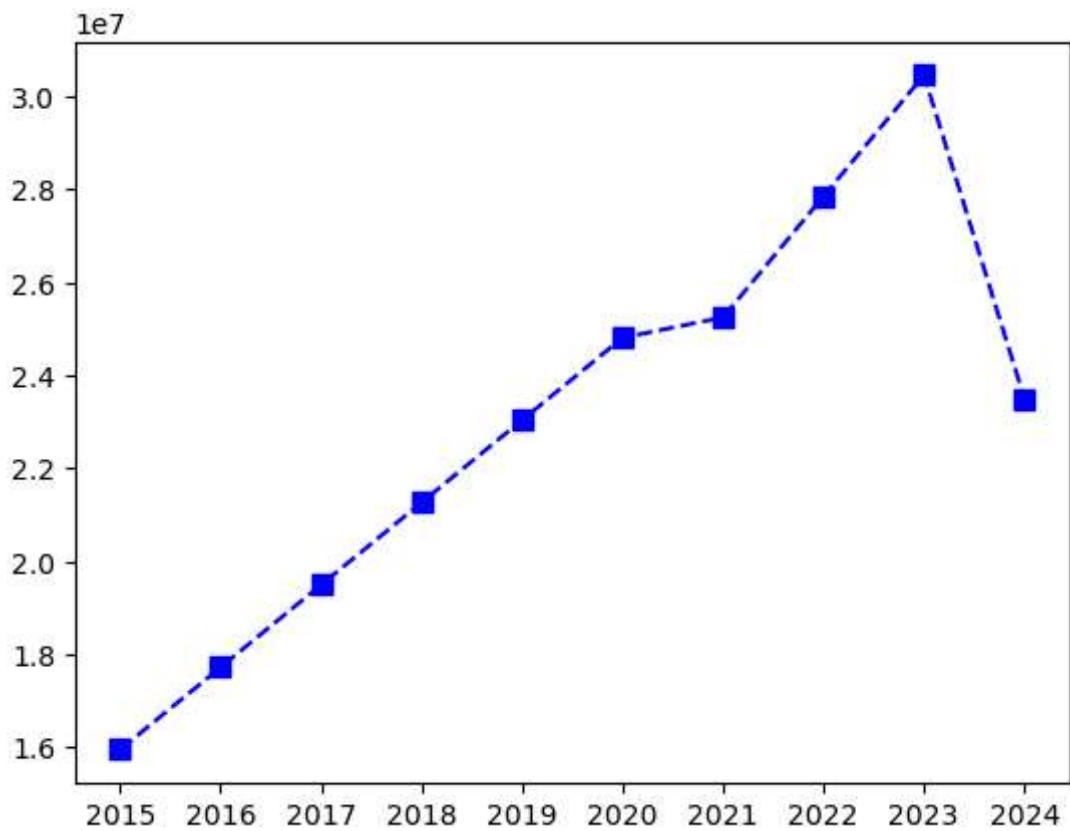
In [11]: Games

```
Out[11]: 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]]])
```

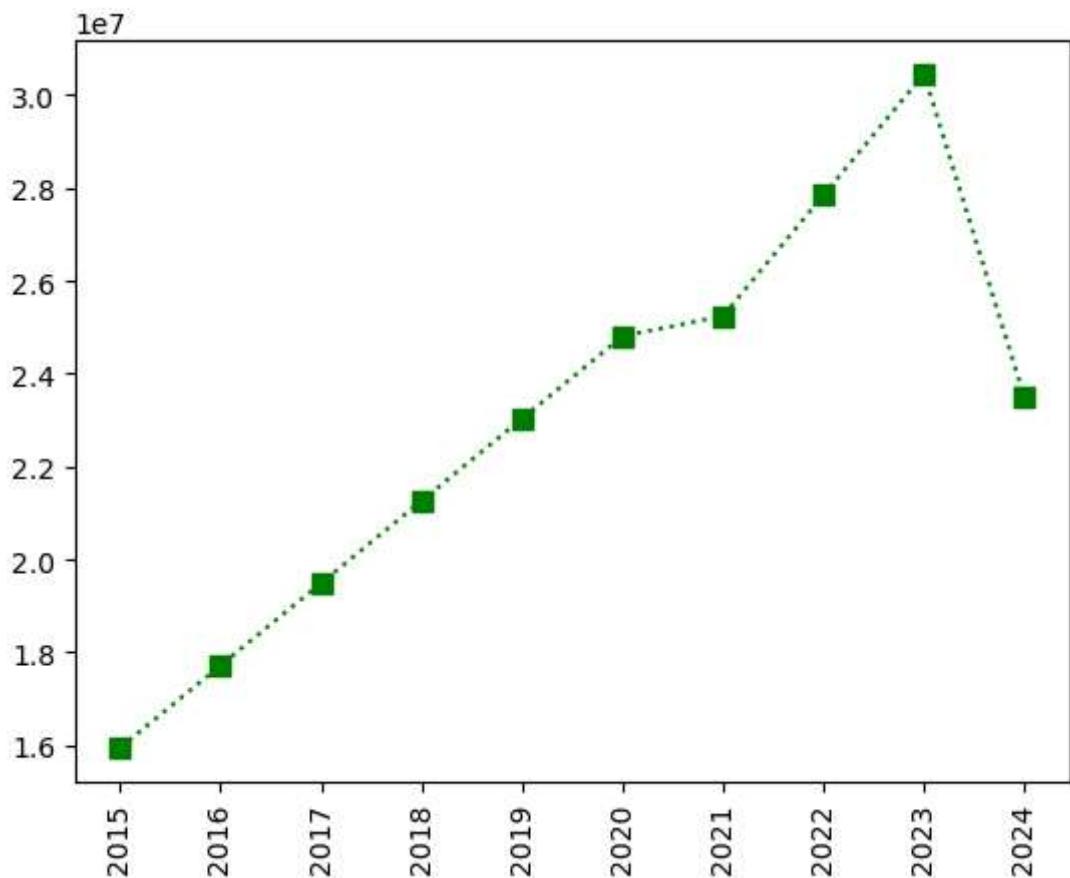
In [12]: Points

```
Out[12]: 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 [14]: plt.plot(Salary[0],c='blue',ls='--',marker='s',ms=7)
plt.xticks(list(range(0,10)),Seasons)
plt.show()
```



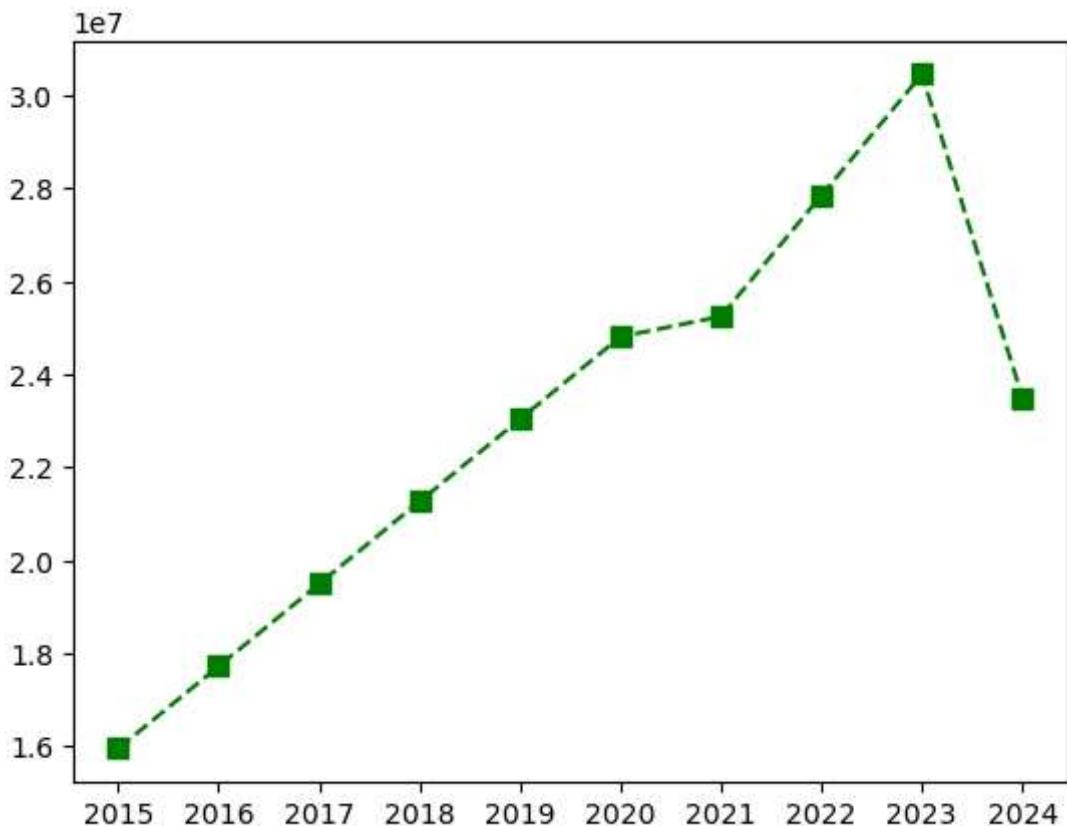
```
In [22]: plt.plot(Salary[0], c='Green', marker = 's', ls = ':', ms = 7, label = Players[0])
plt.xticks(list(range(0,10)), Seasons, rotation='vertical')
plt.show()
```



```
In [23]: Games
```

```
Out[23]: 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 [30]: plt.plot(Salary[0], c='Green', ls = '--', marker = 's', ms = 7, label = Players[0])  
plt.xticks(list(range(0,10)), Seasons, rotation='horizontal')  
plt.show()
```



```
In [31]: Salary[0]
```

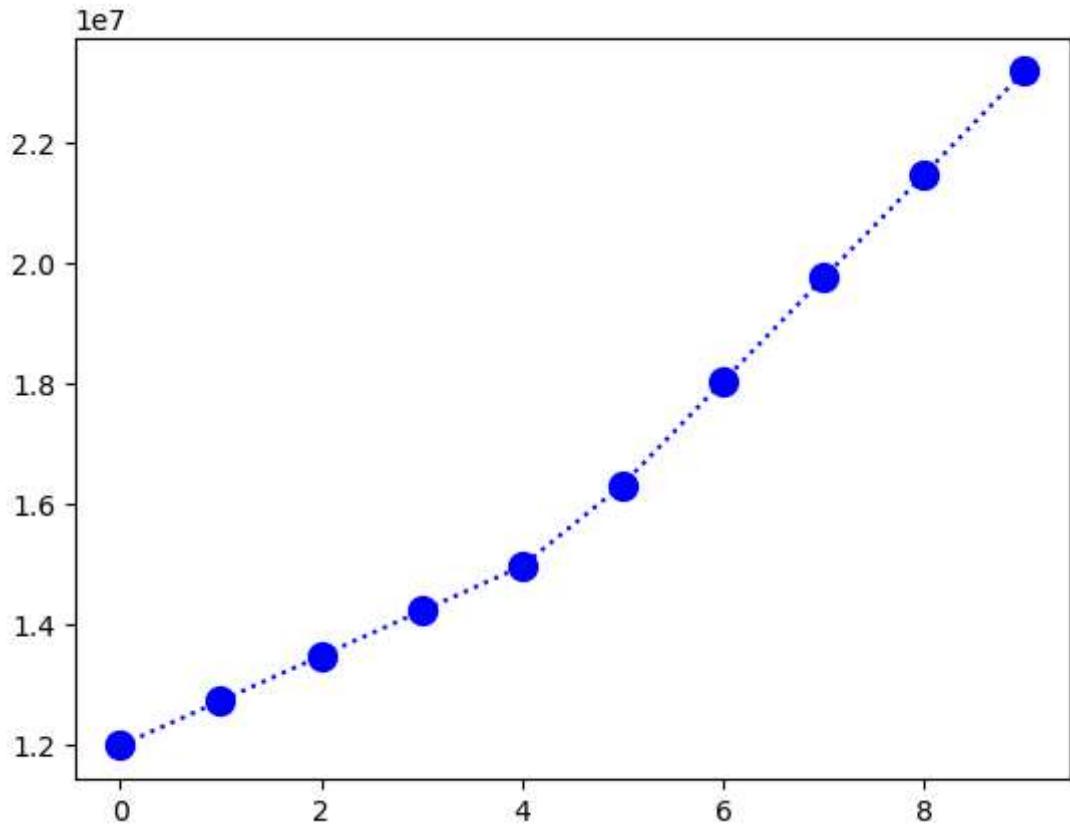
```
Out[31]: array([15946875, 17718750, 19490625, 21262500, 23034375, 24806250,  
 25244493, 27849149, 30453805, 23500000])
```

```
In [32]: Salary[1]
```

```
Out[32]: array([12000000, 12744189, 13488377, 14232567, 14976754, 16324500,  
 18038573, 19752645, 21466718, 23180790])
```

```
In [35]: plt.plot(Salary[1],c='Blue',ls=':',marker='o',ms=10,label=Players[1])
```

```
Out[35]: [
```

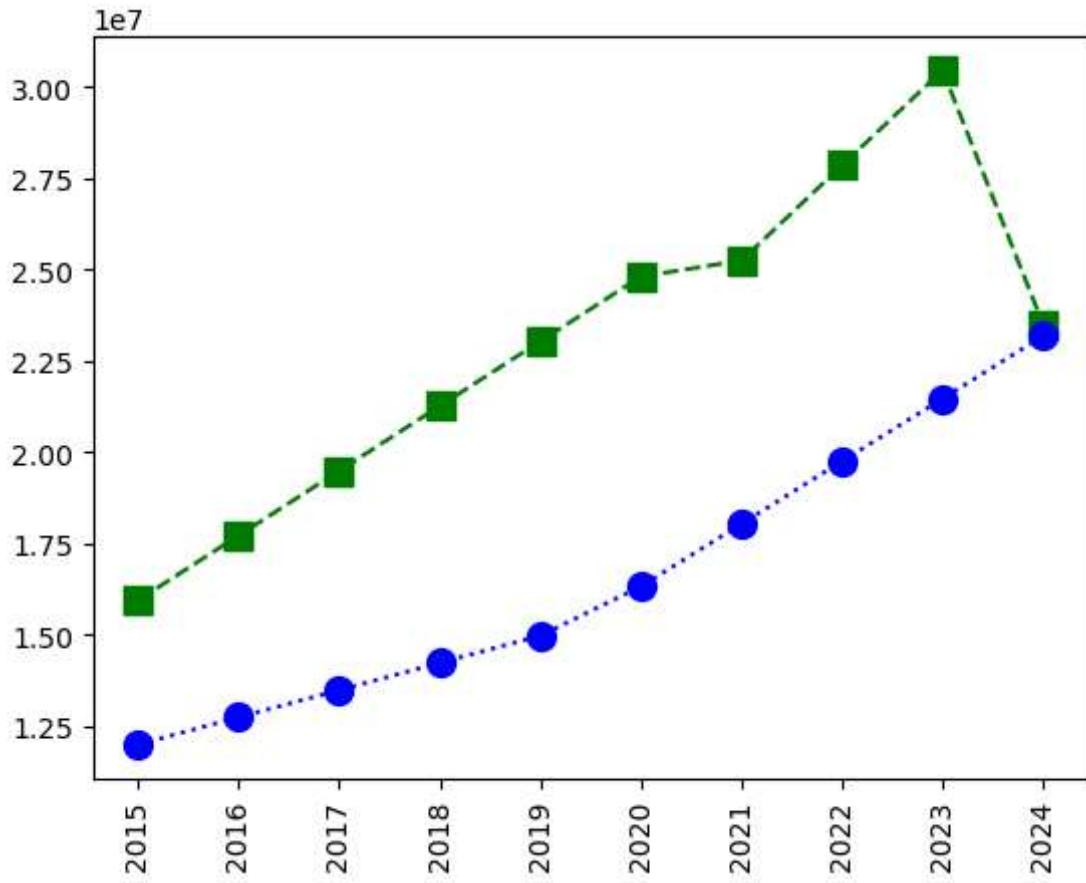


```
In [ ]: # More visualization
```

```
In [36]: plt.plot(Salary[0], c='Green', ls = '--', marker = 's', ms = 10, label = Players[0])
plt.plot(Salary[1], c='Blue', ls = ':', marker = 'o', ms = 10, label = Players[1])

plt.xticks(list(range(0,10)), Seasons, rotation='vertical')

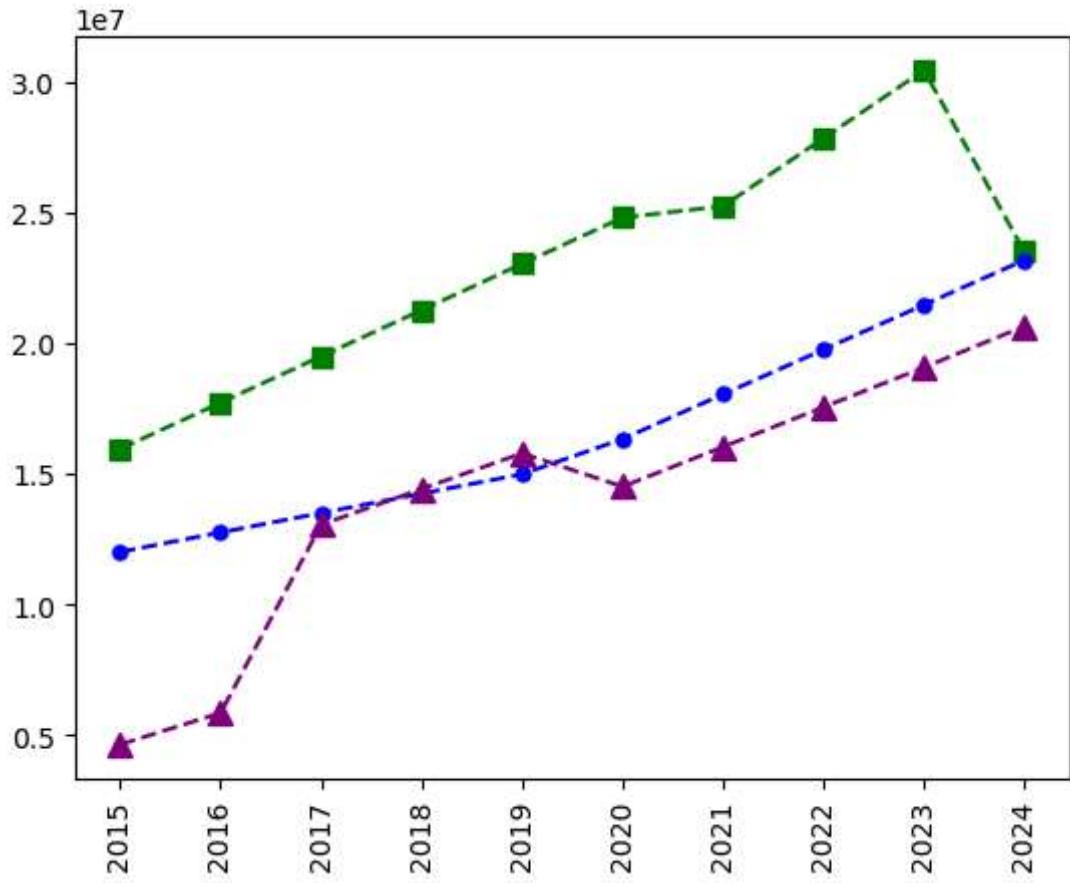
plt.show()
```



```
In [37]: plt.plot(Salary[0], c='Green', ls = '--', marker = 's', ms = 7, label = Players[0])
plt.plot(Salary[1], c='Blue', ls = '--', marker = 'o', ms = 5, label = Players[1])
plt.plot(Salary[2], c='purple', ls = '--', marker = '^', ms = 8, label = Players[2])

plt.xticks(list(range(0,10)), Seasons, rotation='vertical')

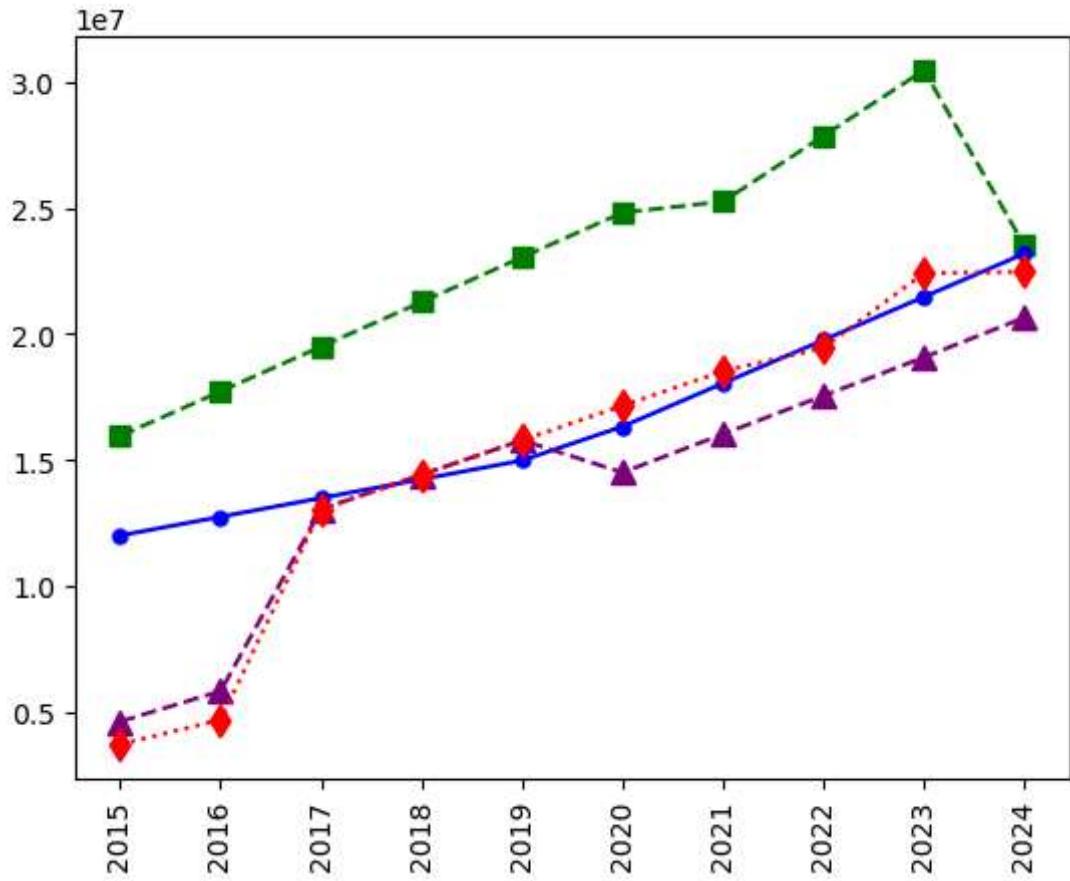
plt.show()
```



```
In [38]: plt.plot(Salary[0], c='Green', ls = '--', marker = 's', ms = 7, label = Players[0])
plt.plot(Salary[1], c='Blue', ls = '-.', marker = 'o', ms = 5, label = Players[1])
plt.plot(Salary[2], c='purple', ls = '--', marker = '^', ms = 8, label = Players[2])
plt.plot(Salary[3], c='Red', ls = ':', marker = 'd', ms = 8, label = Players[3])

plt.xticks(list(range(0,10)), Seasons, rotation='vertical')

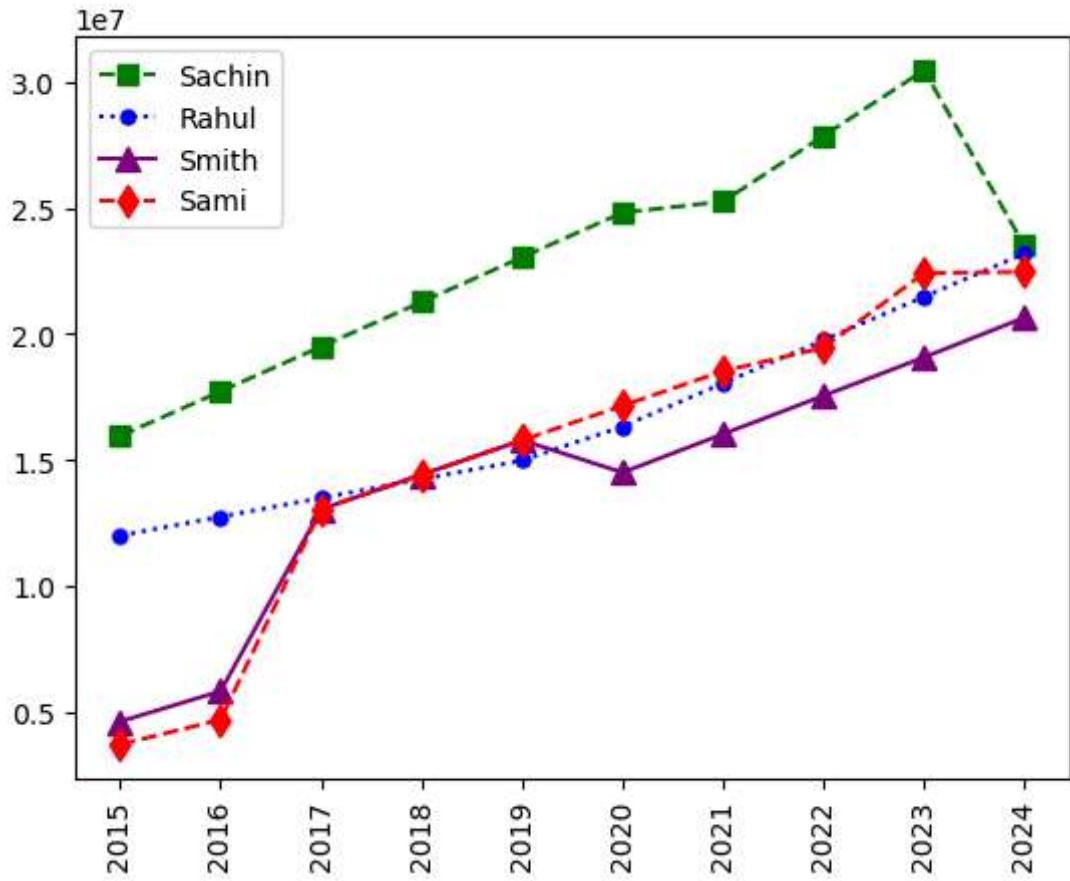
plt.show()
```



```
In [39]: # how to add Legned in visualisation
```

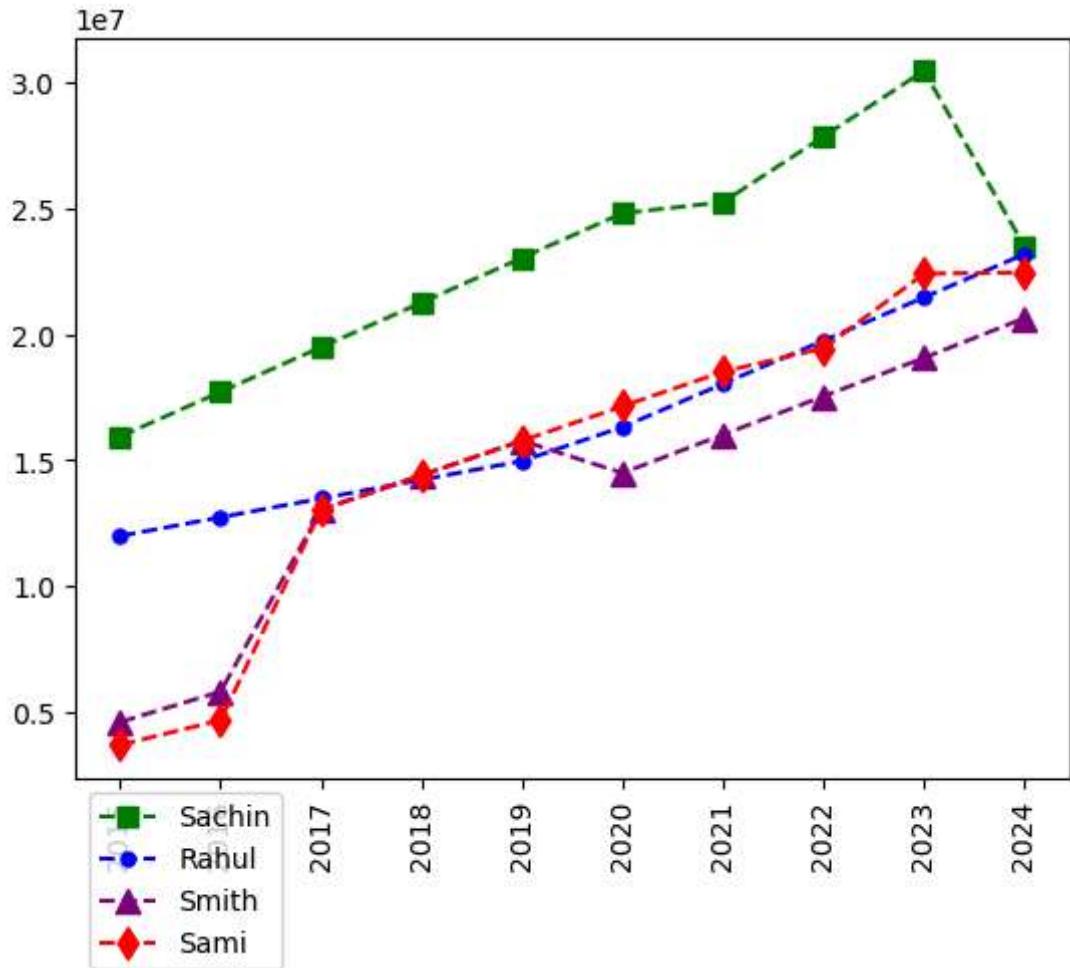
```
plt.plot(Salary[0], c='Green', ls = '--', marker = 's', ms = 7, label = Players[0])
plt.plot(Salary[1], c='Blue', ls = ':', marker = 'o', ms = 5, label = Players[1])
plt.plot(Salary[2], c='purple', ls = '-.', marker = '^', ms = 8, label = Players[2])
plt.plot(Salary[3], c='Red', ls = '--', marker = 'd', ms = 8, label = Players[3])
plt.legend()
plt.xticks(list(range(0,10)), Seasons, rotation='vertical')

plt.show()
```



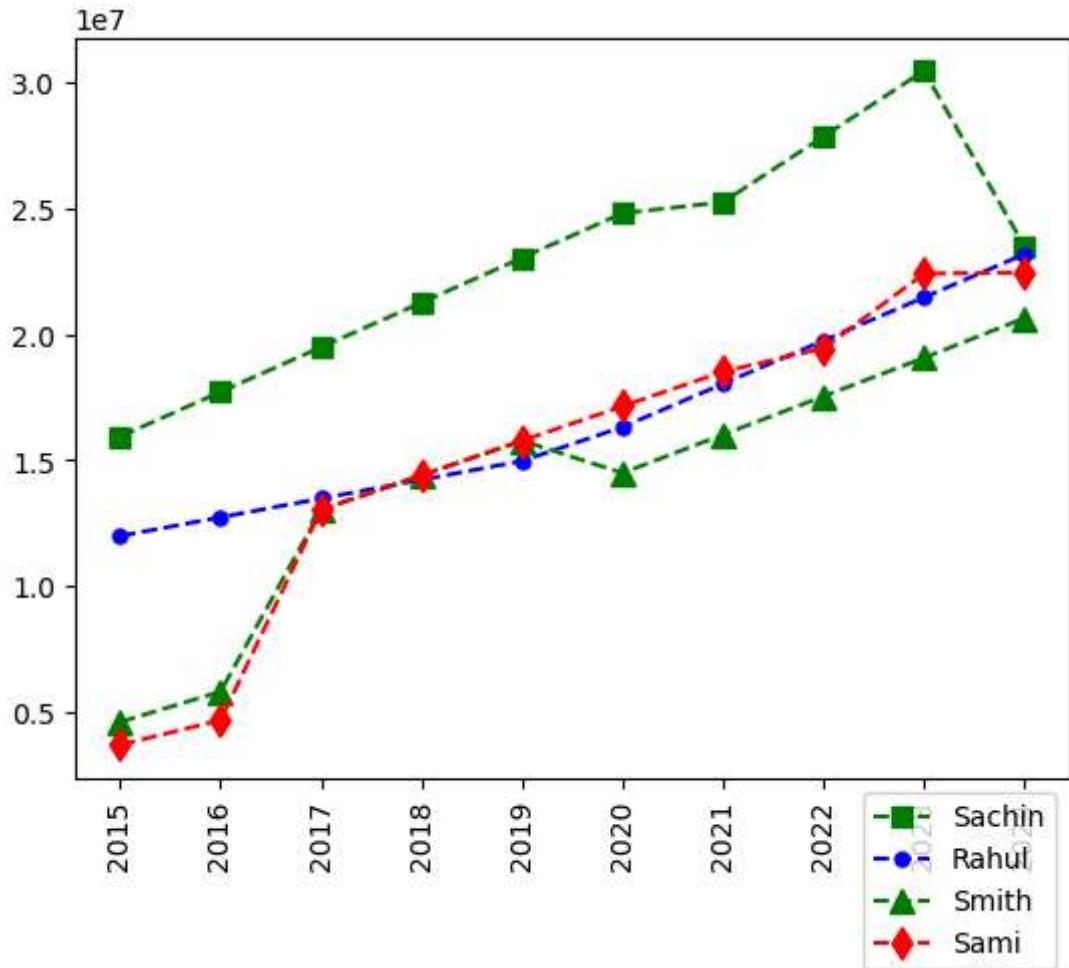
```
In [40]: plt.plot(Salary[0], c='Green', ls = '--', marker = 's', ms = 7, label = Players[0])
plt.plot(Salary[1], c='Blue', ls = '--', marker = 'o', ms = 5, label = Players[1]
plt.plot(Salary[2], c='purple', ls = '--', marker = '^', ms = 8, label = Players[2]
plt.plot(Salary[3], c='Red', ls = '--', marker = 'd', ms = 8, label = Players[3]
plt.legend(loc = 'upper left',bbox_to_anchor=(0,0) )
plt.xticks(list(range(0,10)), Seasons,rotation='vertical')

plt.show()
```



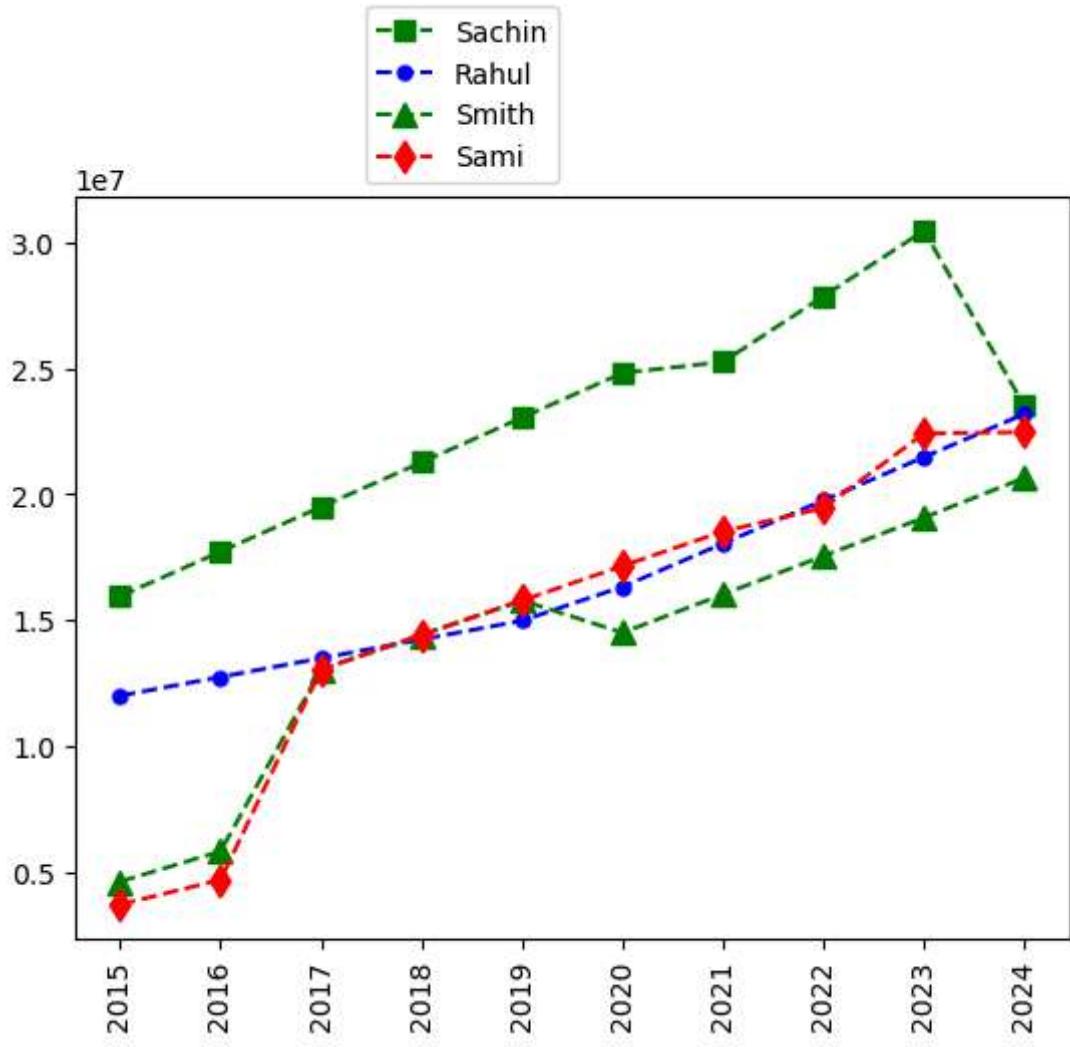
```
In [41]: plt.plot(Salary[0], c='Green', ls = '--', marker = 's', ms = 7, label = Players[0]
plt.plot(Salary[1], c='Blue', ls = '--', marker = 'o', ms = 5, label = Players[1]
plt.plot(Salary[2], c='Green', ls = '--', marker = '^', ms = 8, label = Players[2]
plt.plot(Salary[3], c='Red', ls = '--', marker = 'd', ms = 8, label = Players[3])
plt.legend(loc = 'upper right',bbox_to_anchor=(1,0) )
plt.xticks(list(range(0,10)), Seasons,rotation='vertical')

plt.show()
```



```
In [42]: plt.plot(Salary[0], c='Green', ls = '--', marker = 's', ms = 7, label = Players[0])
plt.plot(Salary[1], c='Blue', ls = '--', marker = 'o', ms = 5, label = Players[1])
plt.plot(Salary[2], c='Green', ls = '--', marker = '^', ms = 8, label = Players[2])
plt.plot(Salary[3], c='Red', ls = '--', marker = 'd', ms = 8, label = Players[3])
plt.legend(loc = 'lower right',bbox_to_anchor=(0.5,1) )
plt.xticks(list(range(0,10)), Seasons,rotation='vertical')

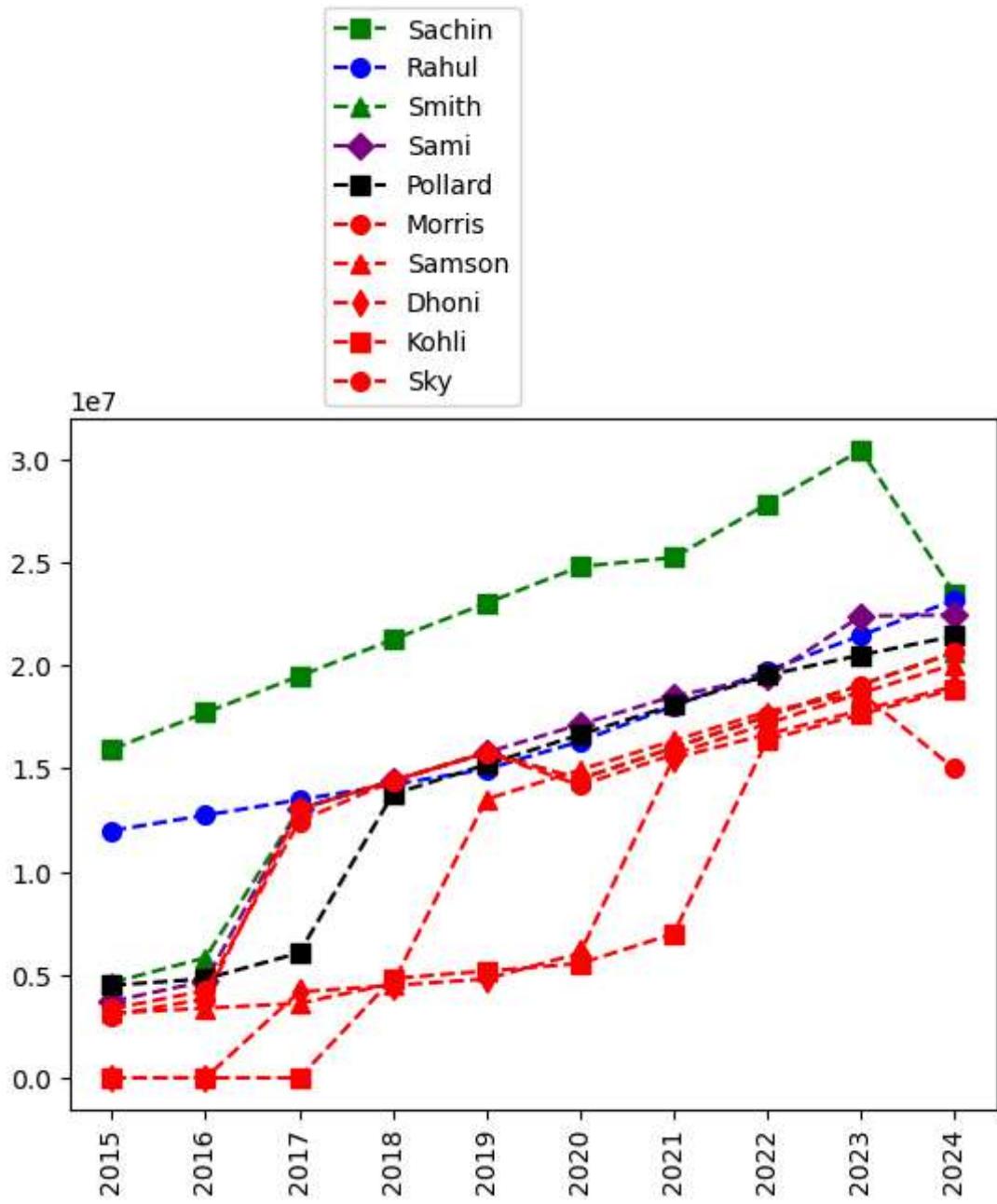
plt.show()
```



```
In [46]: plt.plot(Salary[0], c='Green', ls = '--', marker = 's', ms = 7, label = Players[0]
plt.plot(Salary[1], c='Blue', ls = '--', marker = 'o', ms = 7, label = Players[1]
plt.plot(Salary[2], c='Green', ls = '--', marker = '^', ms = 7, label = Players[2]
plt.plot(Salary[3], c='Purple', ls = '--', marker = 'D', ms = 7, label = Players[3]
plt.plot(Salary[4], c='Black', ls = '--', marker = 's', ms = 7, label = Players[4]
plt.plot(Salary[5], c='Red', ls = '--', marker = 'o', ms = 7, label = Players[5]
plt.plot(Salary[6], c='Red', ls = '--', marker = '^', ms = 7, label = Players[6]
plt.plot(Salary[7], c='Red', ls = '--', marker = 'd', ms = 7, label = Players[7]
plt.plot(Salary[8], c='Red', ls = '--', marker = 's', ms = 7, label = Players[8]
plt.plot(Salary[9], c='Red', ls = '--', marker = 'o', ms = 7, label = Players[9]

plt.legend(loc = 'lower right',bbox_to_anchor=(0.5,1) )
plt.xticks(list(range(0,10)), Seasons, rotation='vertical')

plt.show()
```



In [49]: # we can visualize the how many games played by a player

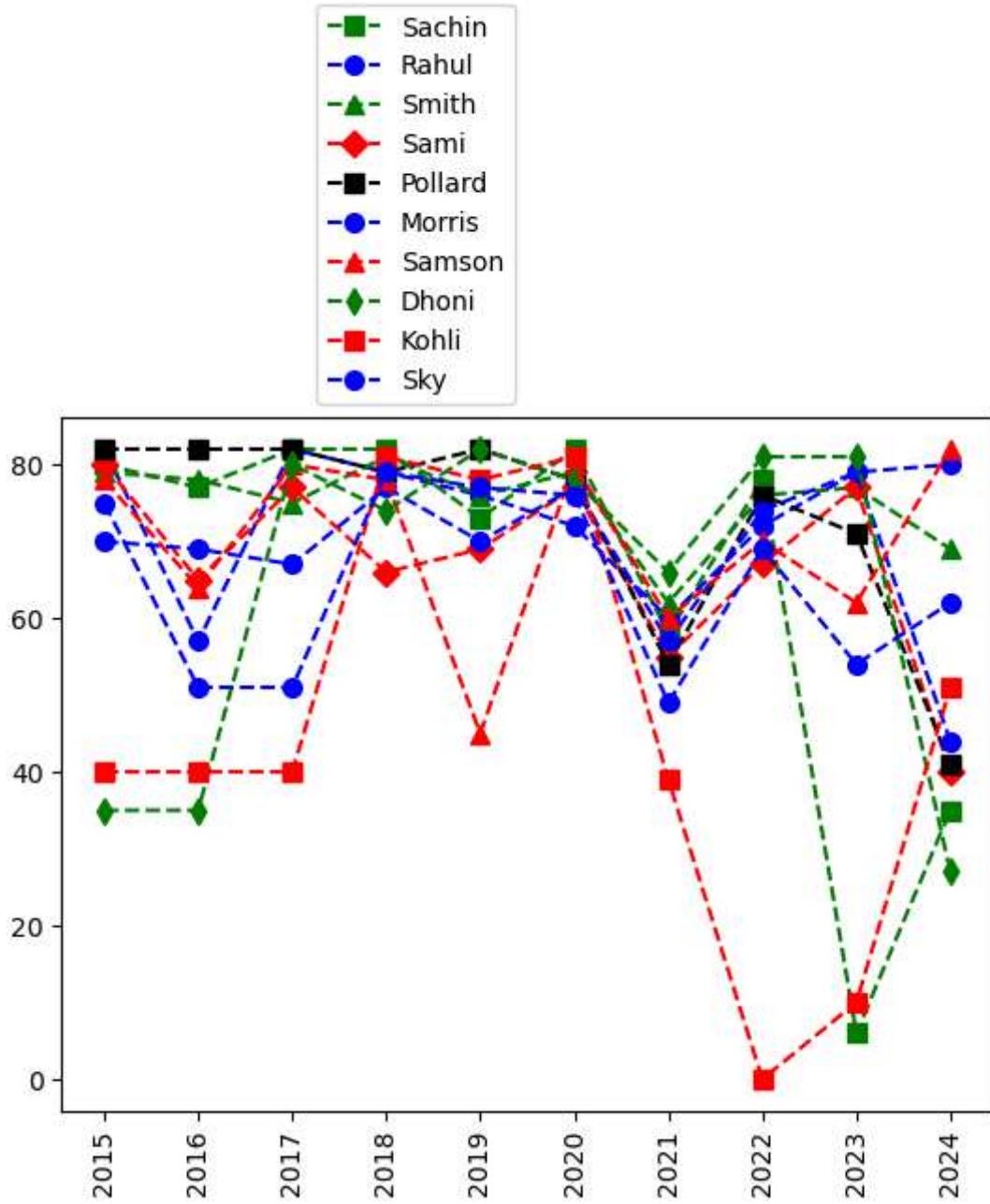
```

plt.plot(Games[0], c='Green', ls = '--', marker = 's', ms = 7, label = Players[0]
plt.plot(Games[1], c='Blue', ls = '--', marker = 'o', ms = 7, label = Players[1]
plt.plot(Games[2], c='Green', ls = '--', marker = '^', ms = 7, label = Players[2]
plt.plot(Games[3], c='Red', ls = '--', marker = 'D', ms = 7, label = Players[3])
plt.plot(Games[4], c='Black', ls = '--', marker = 's', ms = 7, label = Players[4]
plt.plot(Games[5], c='Blue', ls = '--', marker = 'o', ms = 7, label = Players[5]
plt.plot(Games[6], c='red', ls = '--', marker = '^', ms = 7, label = Players[6])
plt.plot(Games[7], c='Green', ls = '--', marker = 'd', ms = 7, label = Players[7]
plt.plot(Games[8], c='Red', ls = '--', marker = 's', ms = 7, label = Players[8])
plt.plot(Games[9], c='Blue', ls = '--', marker = 'o', ms = 7, label = Players[9]

plt.legend(loc = 'lower right',bbox_to_anchor=(0.5,1) )
plt.xticks(list(range(0,10)), Seasons, rotation='vertical')

plt.show()

```



In this section we learned -
1>Matrices
2>Building matrices - np.reshape
3>Dictionaried in python (order doesnot matter) (keys & values)
4>visualizaing using pyplot
5>Basket ball analysis