IPL Data Analysis

MATRICES / NUMPY -----

- Matrix is the tabular representation of the data
- Lot of datas are stored in table format,that shows Matrix importance in python
- as we working on dataframe so matrices are played a major rule
- List is one dimension & matrix is multidimension
- indexation is very important to plot the datapoints
- in this project we are analying top 10 IPL highest paid player in 2015-2024 season
- we will analyze how 10 players have been playing over the past 10 years & we had the data for past 10yrs yrs
- our main goal is to find trends,patterns & their performance for the past 10 yrs
- ultimately they haven't always been top 10 player & lets see their performance patterns

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

#Created last 10 years Seasons,top 10 Players and their salaries data using lis
#Seasons
Seasons = ["2015","2016","2017","2018","2019","2020","2021","2022","2023","202
Sdict = {"2015":0,"2016":1,"2017":2,"2018":3,"2019":4,"2020":5,"2021":6,"2022"

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

#Salaries
Sachin_Salary = [15946875,17718750,19490625,21262500,23034375,24806250,2524449
Rahul_Salary = [12000000,12744189,13488377,14232567,14976754,16324500,18038573
Smith_Salary = [4621800,5828090,13041250,14410581,15779912,14500000,16022500,1
Sami_Salary = [3713640,4694041,13041250,14410581,15779912,17149243,18518574,19
Pollard_Salary = [4493160,4806720,6061274,13758000,15202590,16647180,18091770,
Morris_Salary = [3348000,4235220,12455000,14410581,15779912,14500000,16022500,
Samson_Salary = [3144240,3380160,3615960,4574189,13520500,14940153,16359805,17
Dhoni_Salary = [0,0,4171200,4484040,4796880,6053663,15506632,16669630,17832627
Kohli_Salary = [0,0,0,4822800,5184480,5546160,6993708,16402500,17632688,188628
Sky_Salary = [3031920,3841443,13041250,14410581,15779912,14200000,15691000,171
#Matrix
Salary = np.array([Sachin_Salary, Rahul_Salary, Smith_Salary, Sami_Salary, Pol

#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, Sams

#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, Mo
```

In [2]:
```
Salary #displays in Matrix format
```

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,        0,  4822800,  5184480,  5546160,
         6993708, 16402500, 17632688, 18862875],
       [ 3031920,  3841443, 13041250, 14410581, 15779912, 14200000,
        15691000, 17182000, 18673000, 15000000]])
```

In [3]:
```
Games
```

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 [4]:
```
Points
```

Out[4]:
```
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 [72]:
```
Salary[Pdict['Sky']][Sdict['2019']]
```

Out[72]:
```
15779912
```

In [73]:
```
Salary/Games
```

Out[73]:
```
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 [74]:
```
np.round(Salary/Games)
```

Out[74]:
```
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 [6]:
```
import warnings
warnings.filterwarnings('ignore')
```

In [7]:
```
import matplotlib.pyplot as plt  #Visualization
```

In [8]:
```
%matplotlib inline #keep the plot inside the jupter note instead of getting in
```

In [9]:
```
Salary[0]
```

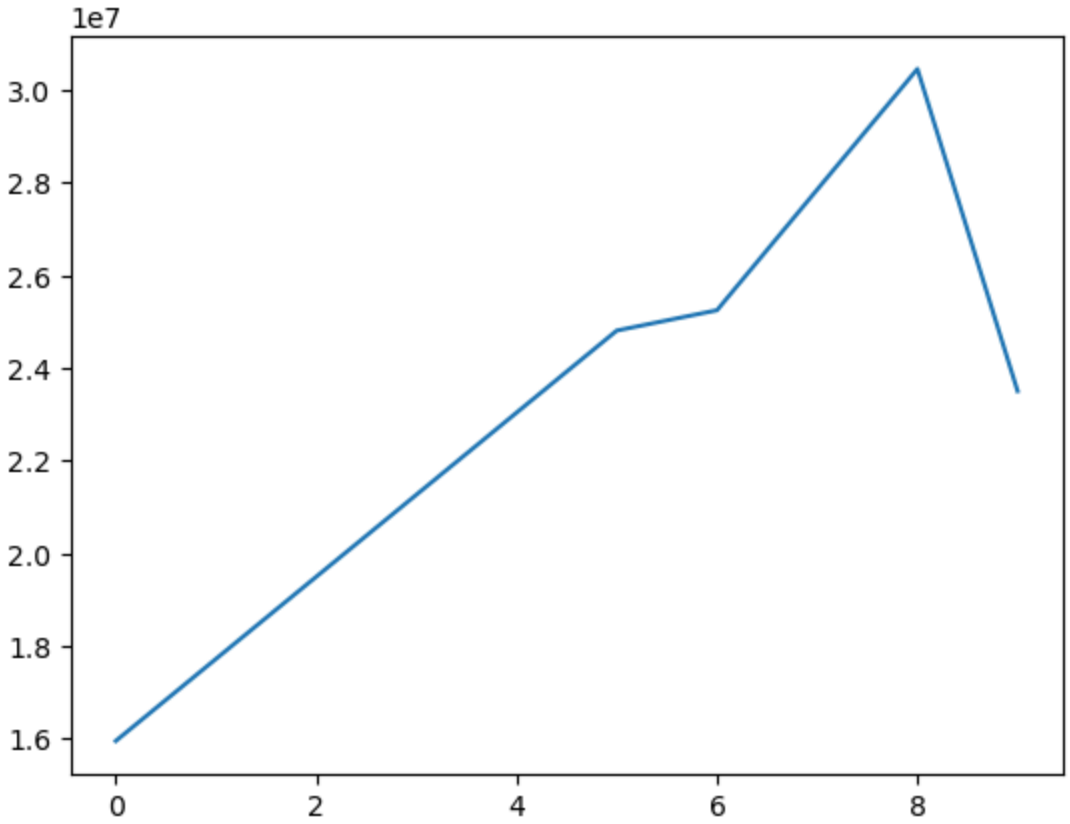
Out[9]:
```
array([15946875, 17718750, 19490625, 21262500, 23034375, 24806250,
       25244493, 27849149, 30453805, 23500000])
```

In [10]:
```
min(Salary[0])
```

Out[10]:
```
15946875
```

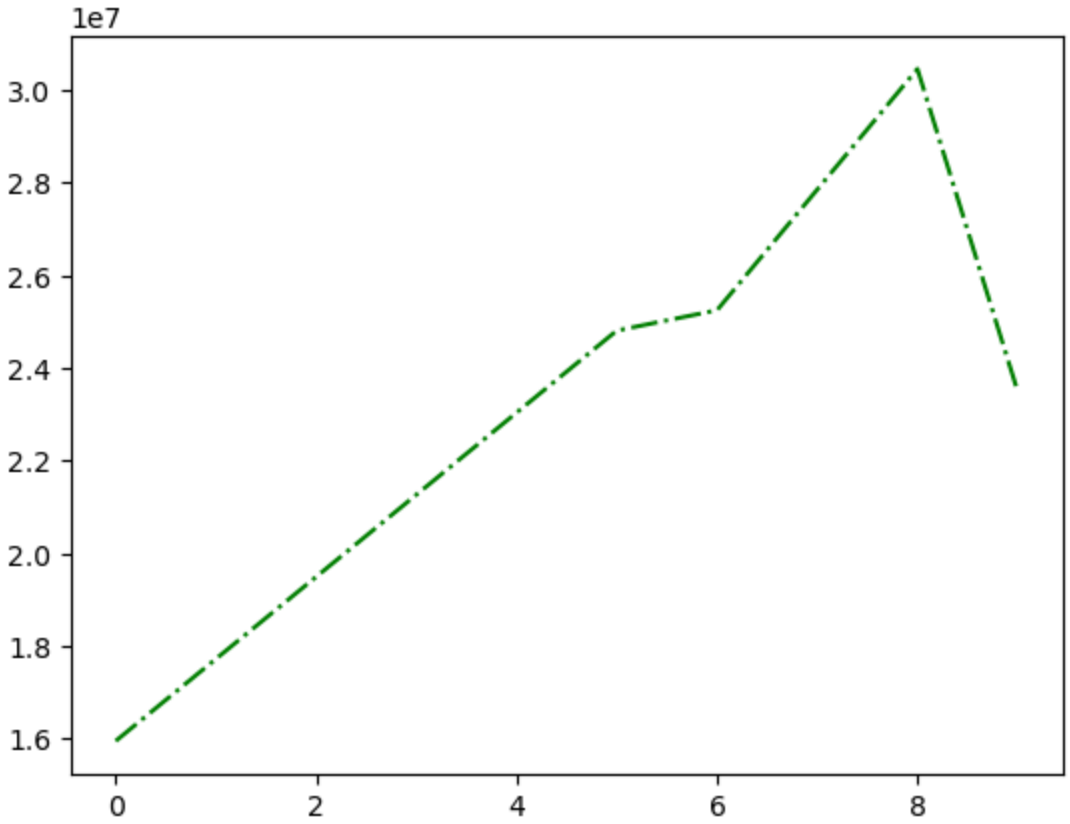
In [11]:
```
plt.plot(Salary[0])
```

Out[11]:
```
[<matplotlib.lines.Line2D at 0x113498410>]
```



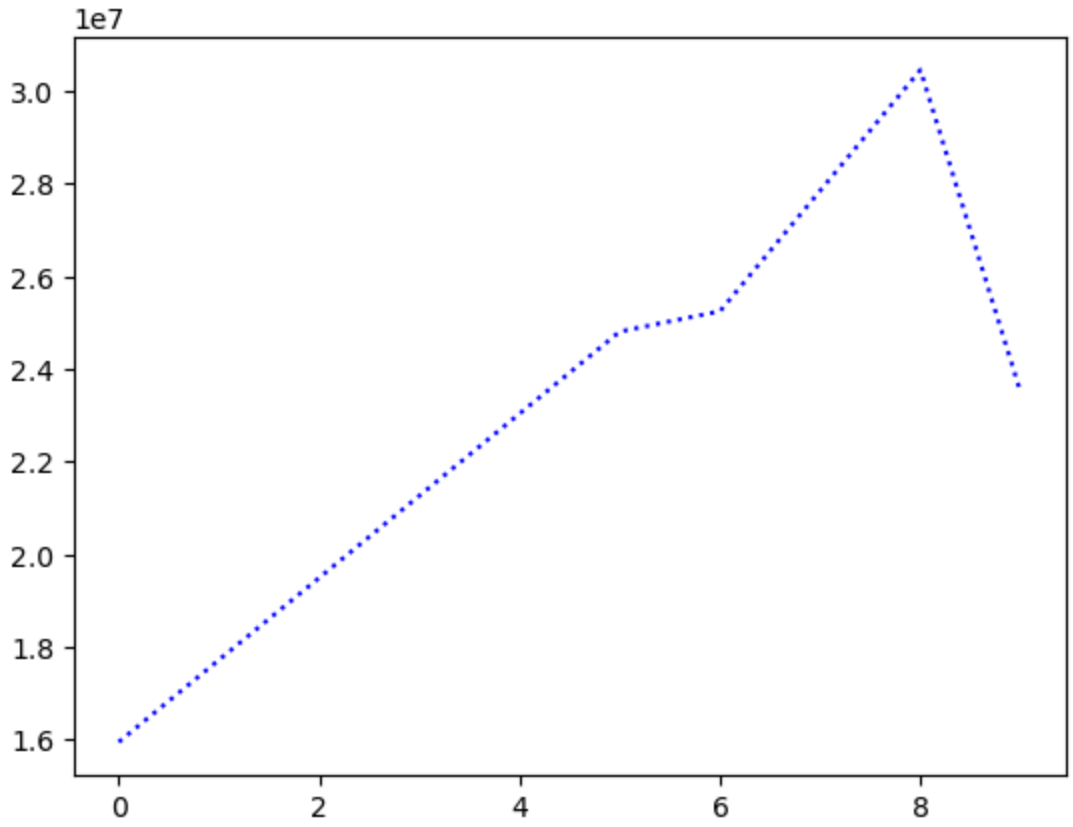
In [18]:
```
plt.plot(Salary[0],ls='-.',c= 'green')  # ls = --,-,:,-. # c is color
```

Out[18]:
```
[<matplotlib.lines.Line2D at 0x114c4bf50>]
```



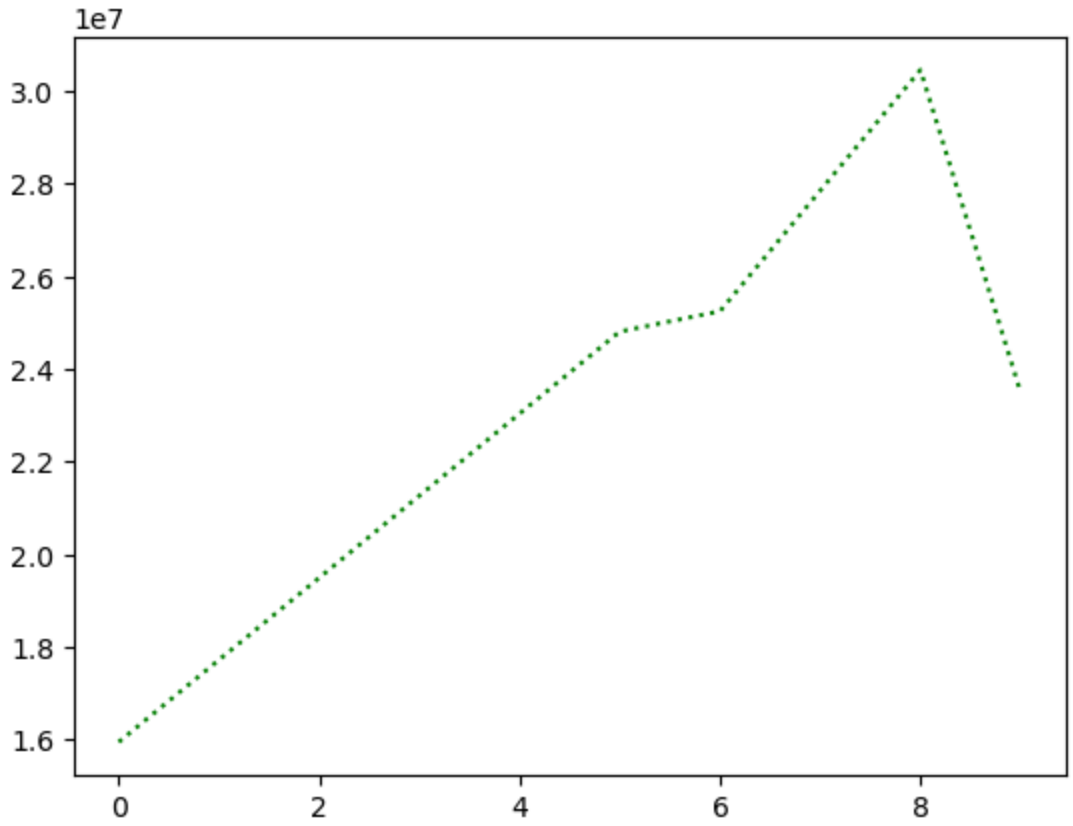
In [21]:
```
plt.plot(Salary[0],ls=':',c= 'b')
```

Out[21]: [<matplotlib.lines.Line2D at 0x113eee290>]



In [22]:
```
plt.plot(Salary[0],c='g',ls='dotted') #Parameter tuning or variables
```

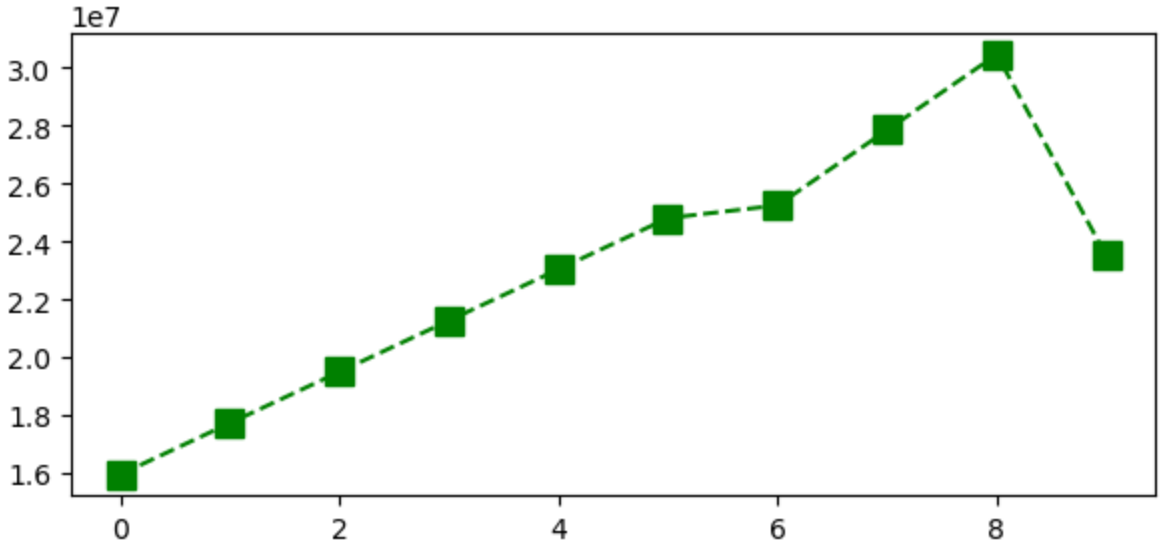
Out[22]: [<matplotlib.lines.Line2D at 0x114dc0f50>]



In [23]:
```
%matplotlib inline
plt.rcParams['figure.figsize']= 7,3
```

In [24]:
```
plt.plot(Salary[0],c='Green',ls='--',marker = 's', ms = 10)
```

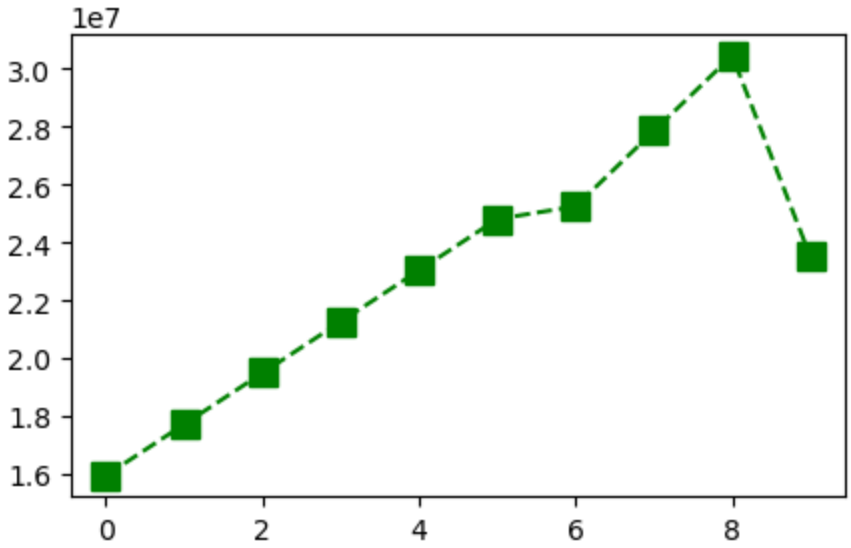
Out[24]:
```
[<matplotlib.lines.Line2D at 0x114e31190>]
```



In [27]:
```
plt.rcParams['figure.figsize']= 5,3
```

In [28]:
```
plt.plot(Salary[0],c='Green',ls='--',marker = 's', ms = 10)
```

Out[28]:
```
[<matplotlib.lines.Line2D at 0x114f19a10>]
```



In [29]:
```
Sdict
```

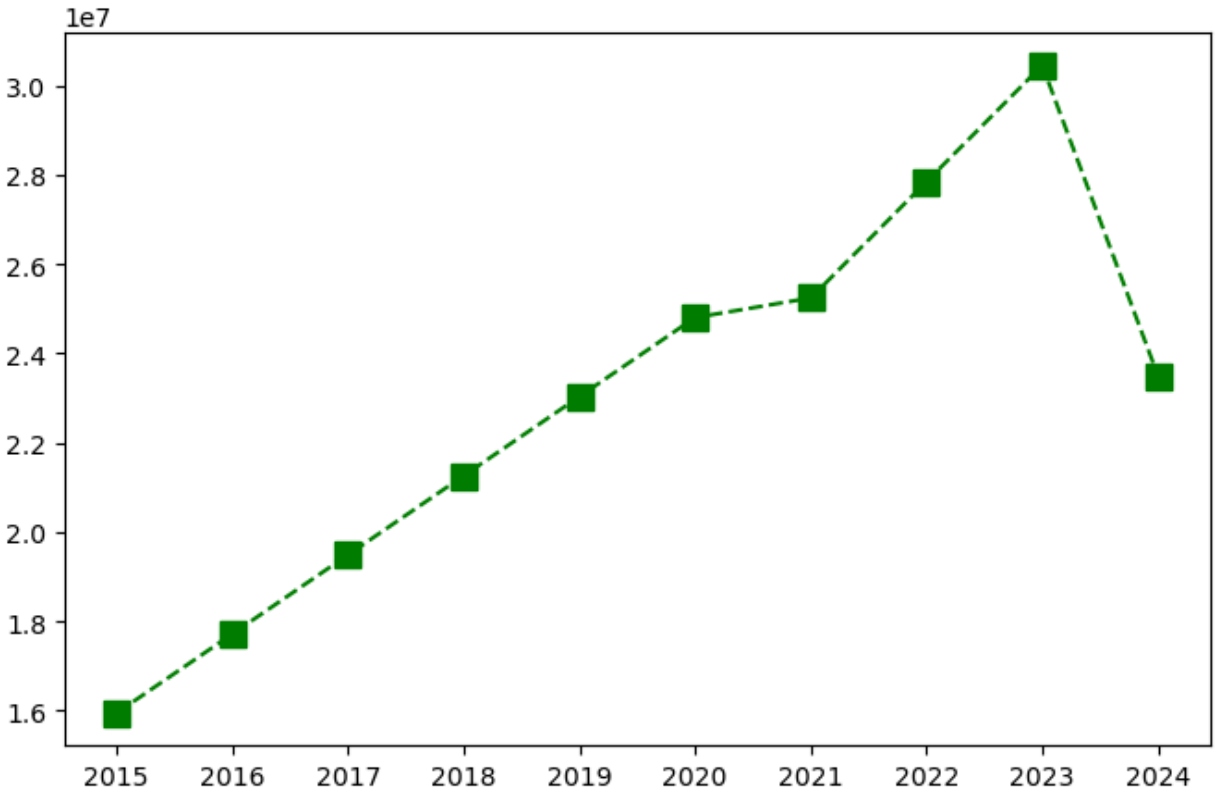
Out[29]:
```
{'2015': 0,
 '2016': 1,
 '2017': 2,
 '2018': 3,
 '2019': 4,
 '2020': 5,
 '2021': 6,
 '2022': 7,
 '2023': 8,
 '2024': 9}
```

In [30]:
```
Pdict
```

Out[30]:
```
{'Sachin': 0,
 'Rahul': 1,
 'Smith': 2,
 'Sami': 3,
 'Pollard': 4,
 'Morris': 5,
 'Samson': 6,
 'Dhoni': 7,
 'Kohli': 8,
 'Sky': 9}
```

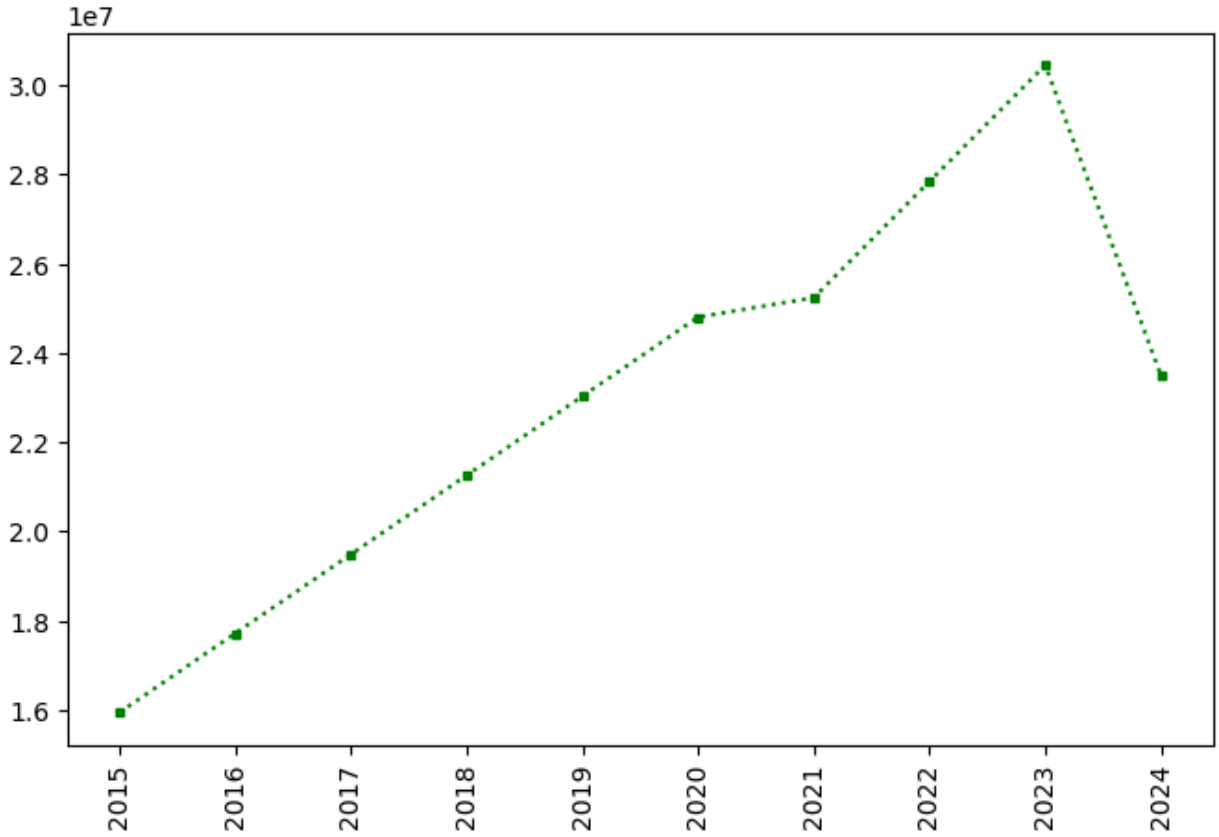
In [40]:
```
plt.rcParams['figure.figsize']= 8,5
plt.plot(Salary[0],c='Green',ls='--',marker = 's', ms = 10)
plt.xticks(list(range(0,10)),Seasons)
plt.show
```

Out[40]:
```
<function matplotlib.pyplot.show(close=None, block=None)>
```



In [44]:
```
plt.plot(Salary[0],c='Green',ls=':',marker='s',ms='3')
plt.xticks(list(range(0,10)),Seasons,rotation='vertical')
plt.show
```

Out[44]:
```
<function matplotlib.pyplot.show(close=None, block=None)>
```

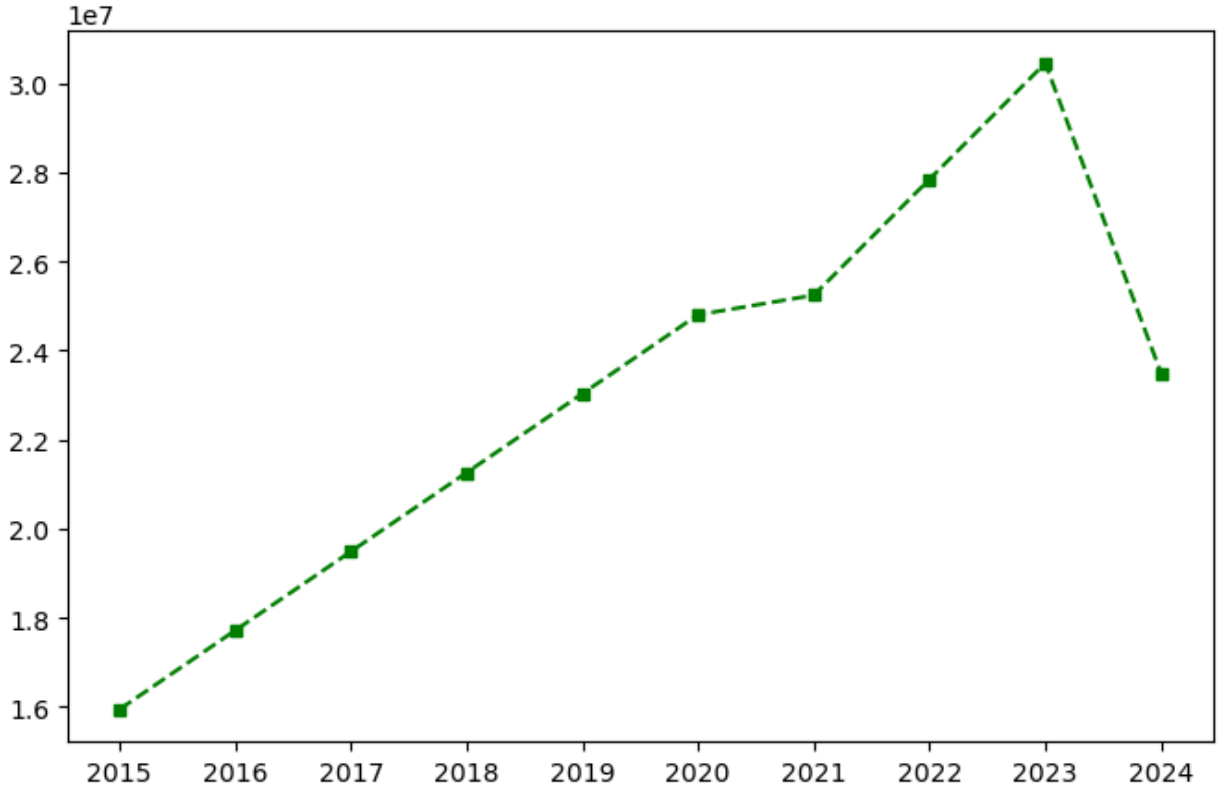


In [45]:
```
Games
```

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 [48]:
```
plt.plot(Salary[0],c='Green',ls='--',marker= 's',ms='5')
plt.xticks(list(range(0,10)),Seasons,rotation='horizontal')
plt.show
```

Out[48]:
```
<function matplotlib.pyplot.show(close=None, block=None)>
```



In [49]:
```
Salary[0]
```

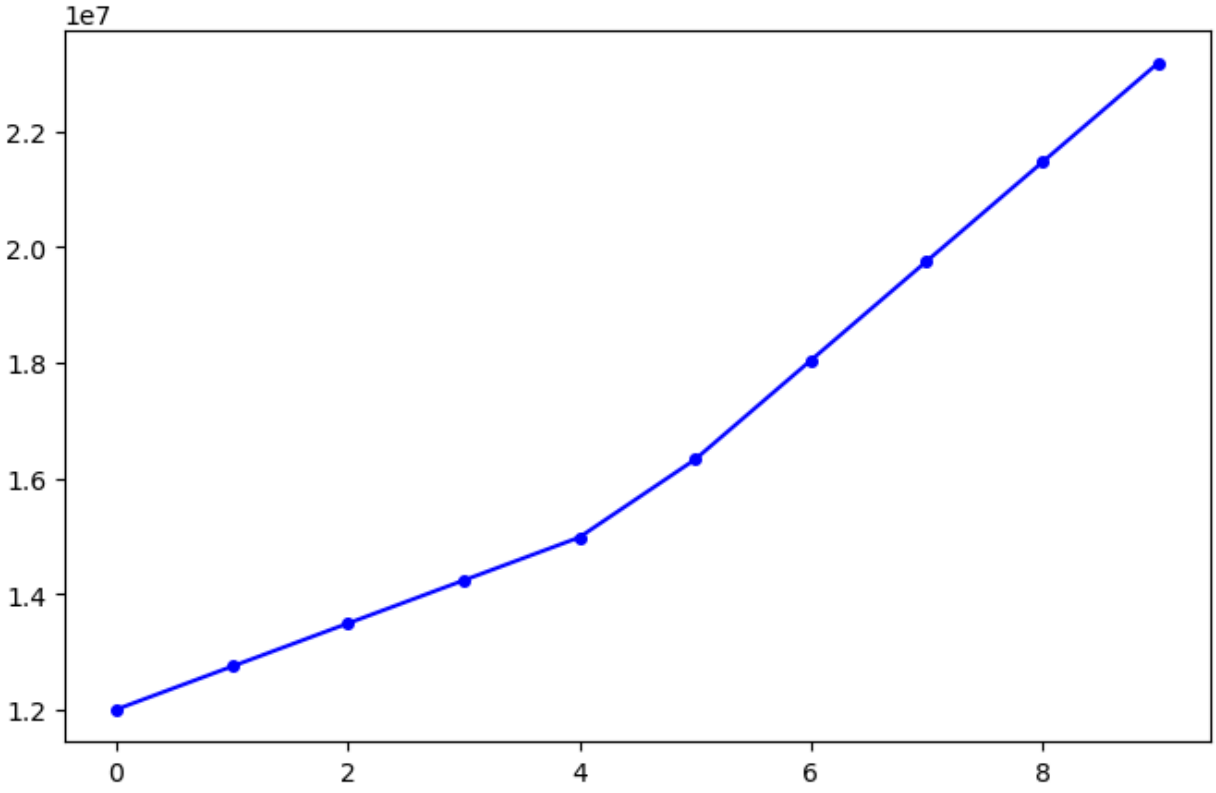
Out[49]:
```
array([15946875, 17718750, 19490625, 21262500, 23034375, 24806250,
       25244493, 27849149, 30453805, 23500000])
```

In [50]:
```
Salary[1]
```

Out[50]:
```
array([12000000, 12744189, 13488377, 14232567, 14976754, 16324500,
       18038573, 19752645, 21466718, 23180790])
```

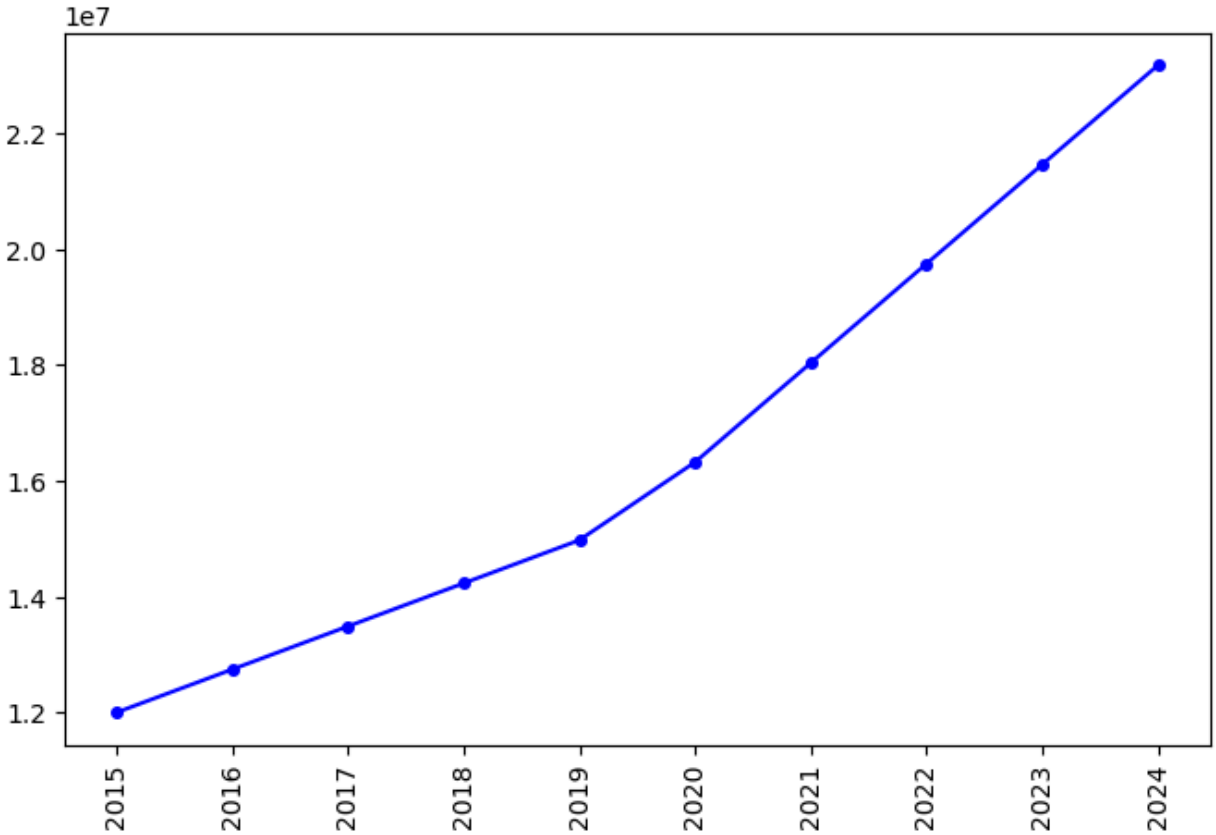
In [56]:
```
plt.plot(Salary[1],c='Blue',ls='-',marker='o',ms=4)
```

Out[56]:
```
[<matplotlib.lines.Line2D at 0x14c97a8d0>]
```



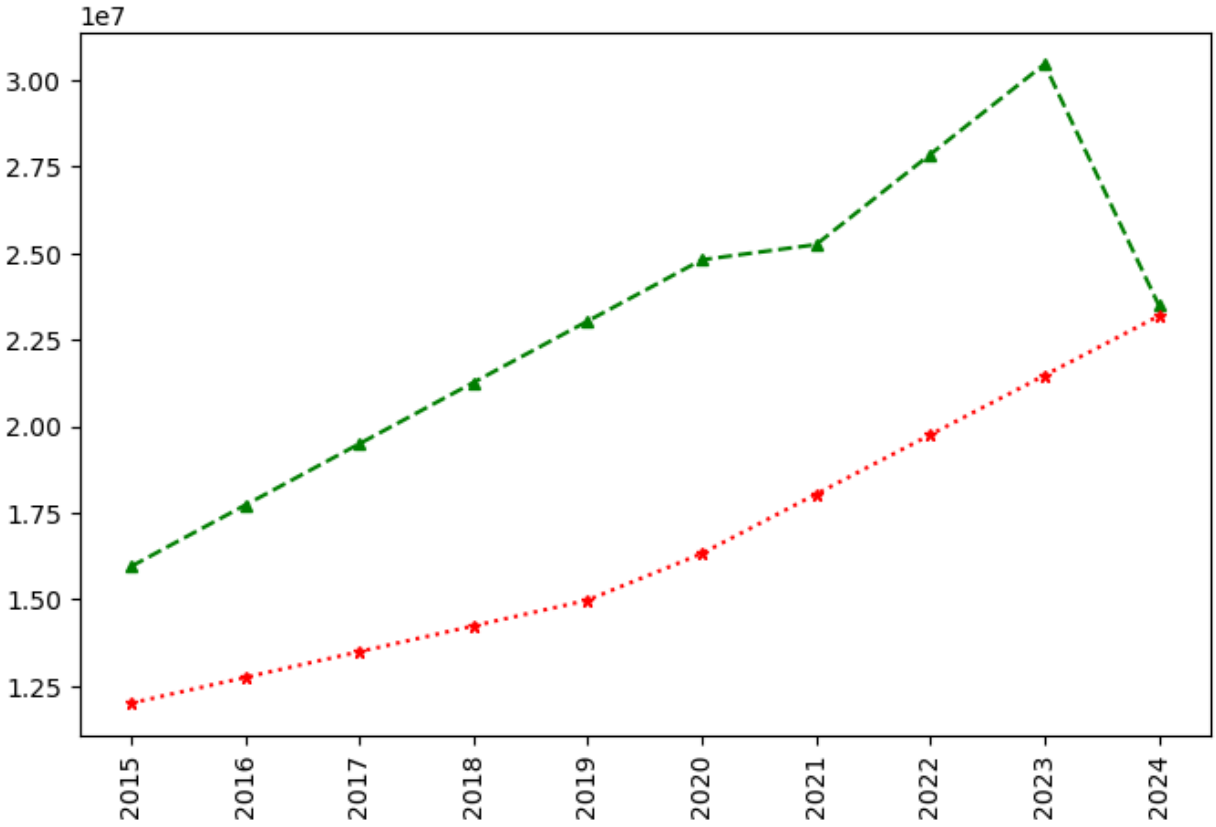
In [57]:
```
plt.plot(Salary[1],c='Blue',ls='-',marker='o',ms=4)
plt.xticks(list(range(0,10)),Seasons,rotation ='vertical')
plt.show
```

Out[57]:
```
<function matplotlib.pyplot.show(close=None, block=None)>
```

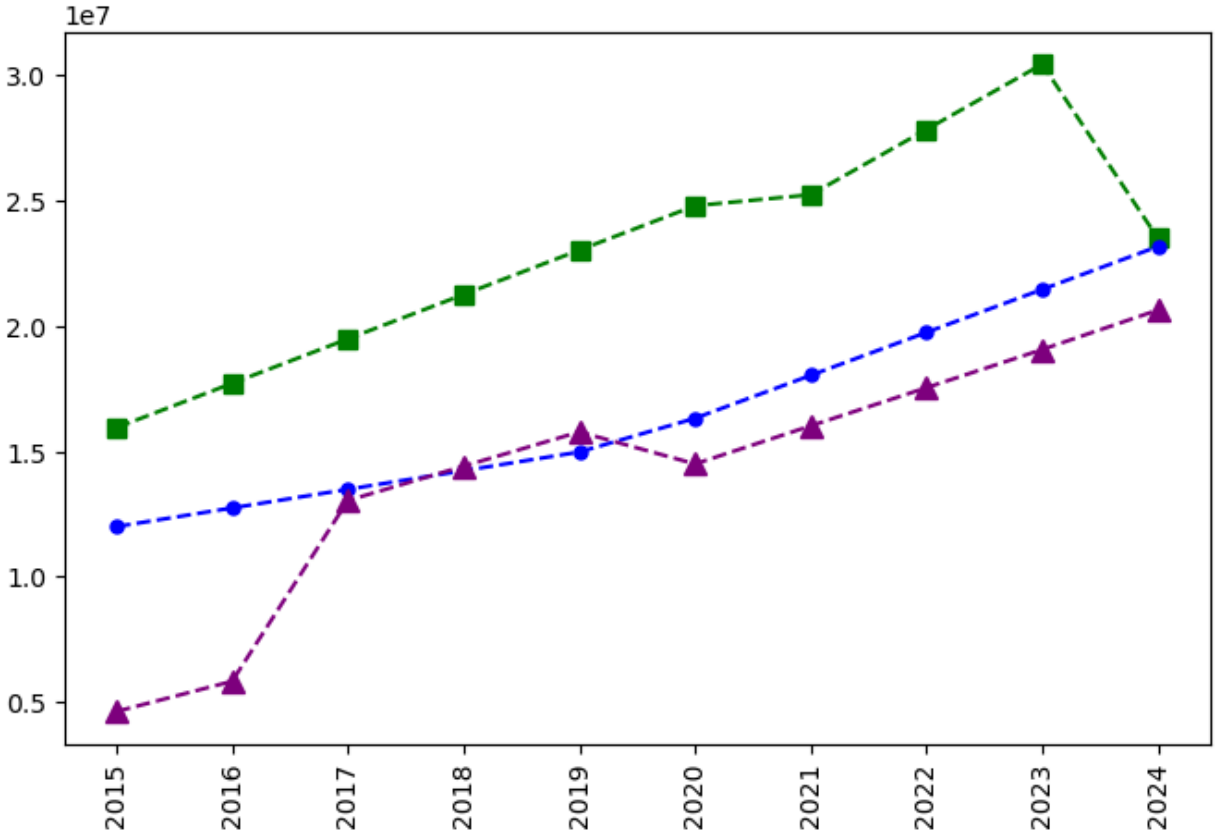


In [59]:
```
plt.plot(Salary[0],c='Green',ls='--',marker= '^',ms = 5)
plt.plot(Salary[1],c='Red',ls=':',marker='*',ms=5)
plt.xticks(list(range(0,10)),Seasons,rotation='vertical')
plt.show
```

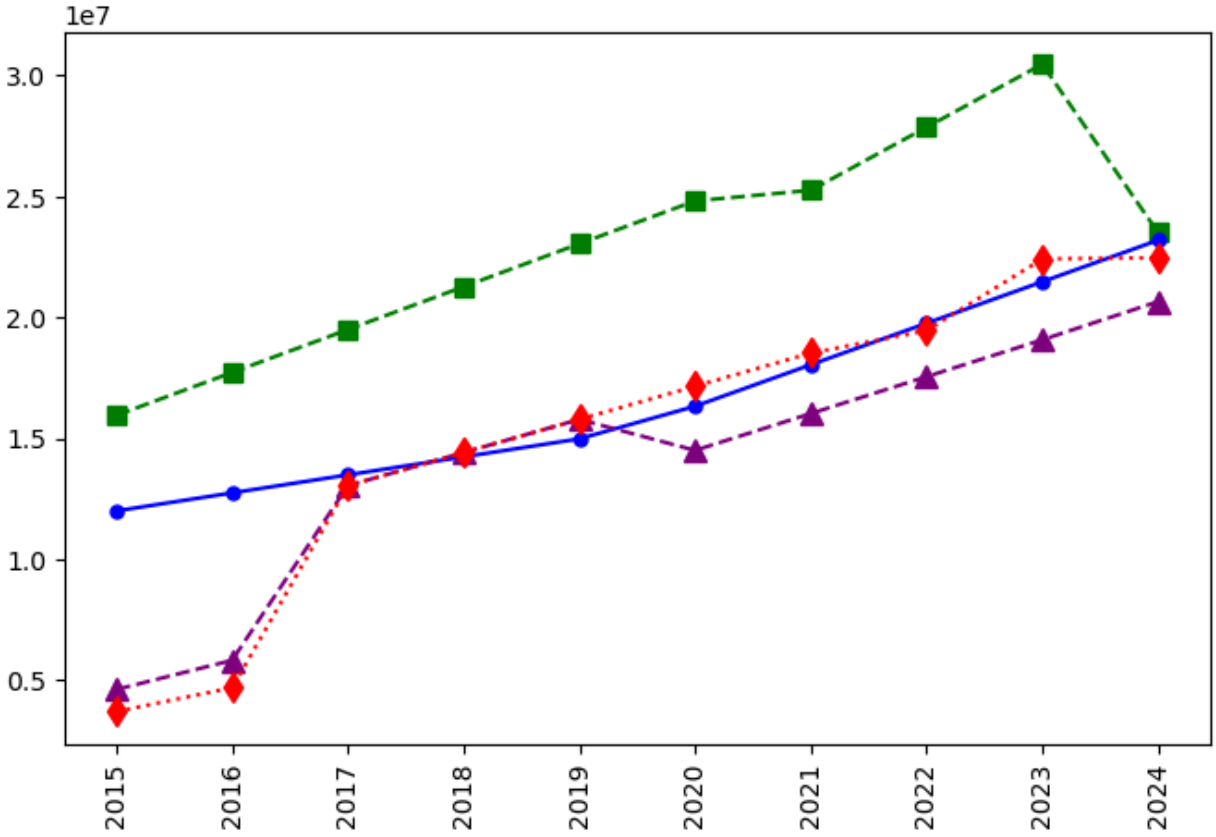
Out[59]:
```
<function matplotlib.pyplot.show(close=None, block=None)>
```



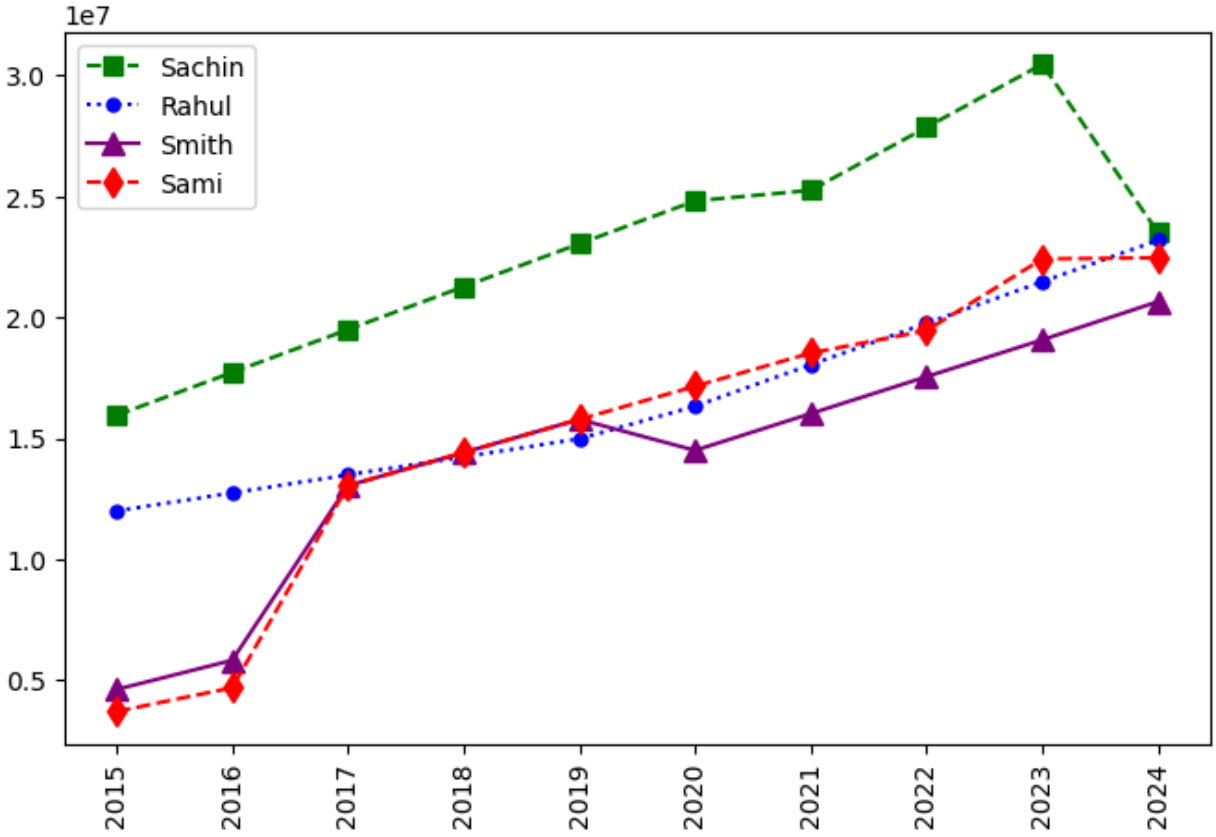
In [60]:
```
plt.plot(Salary[0], c='Green', ls = '--', marker = 's', ms = 7, label = Players
plt.plot(Salary[1], c='Blue', ls = '--', marker = 'o', ms = 5, label = Players
plt.plot(Salary[2], c='purple', ls = '--', marker = '^', ms = 8, label = Playe


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

plt.show()
```



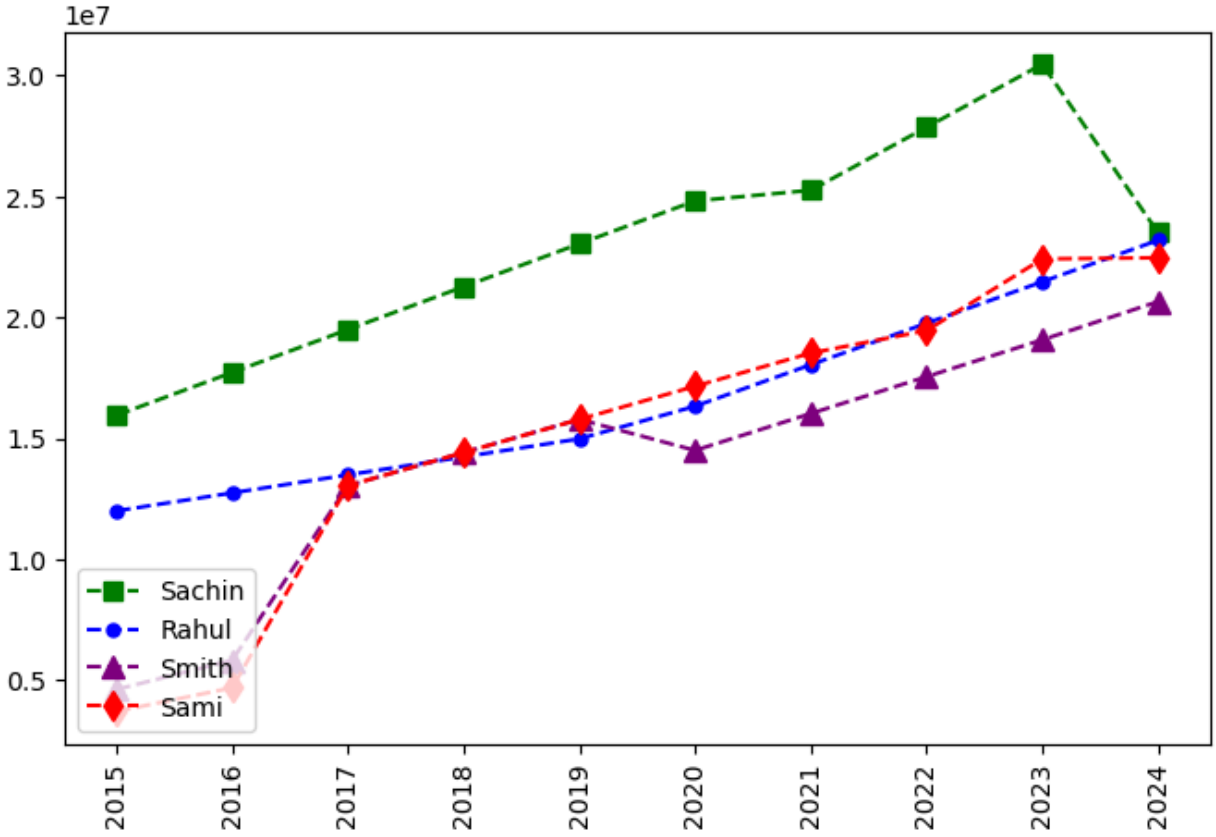
In [61]:
```
plt.plot(Salary[0], c='Green', ls = '--', marker = 's', ms = 7, label = Players
plt.plot(Salary[1], c='Blue', ls = '-', marker = 'o', ms = 5, label = Players[
plt.plot(Salary[2], c='purple', ls = '--', marker = '^', ms = 8, label = Playe
plt.plot(Salary[3], c='Red', ls = ':', marker = 'd', ms = 8, label = Players[3

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

plt.show()
```



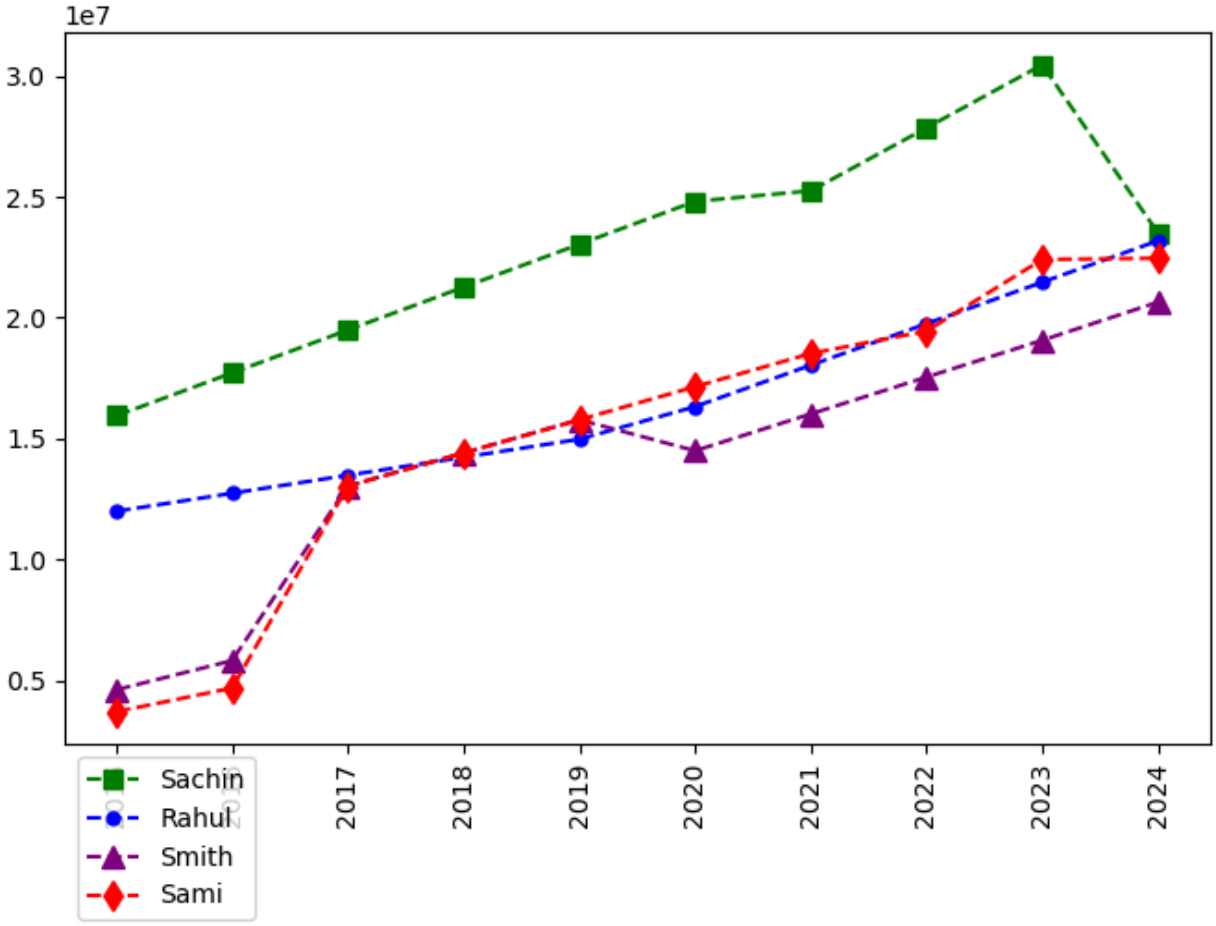
In [62]:
```
# how to add legned in visualisation

plt.plot(Salary[0], c='Green', ls = '--', marker = 's', ms = 7, label = Players
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
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()
```



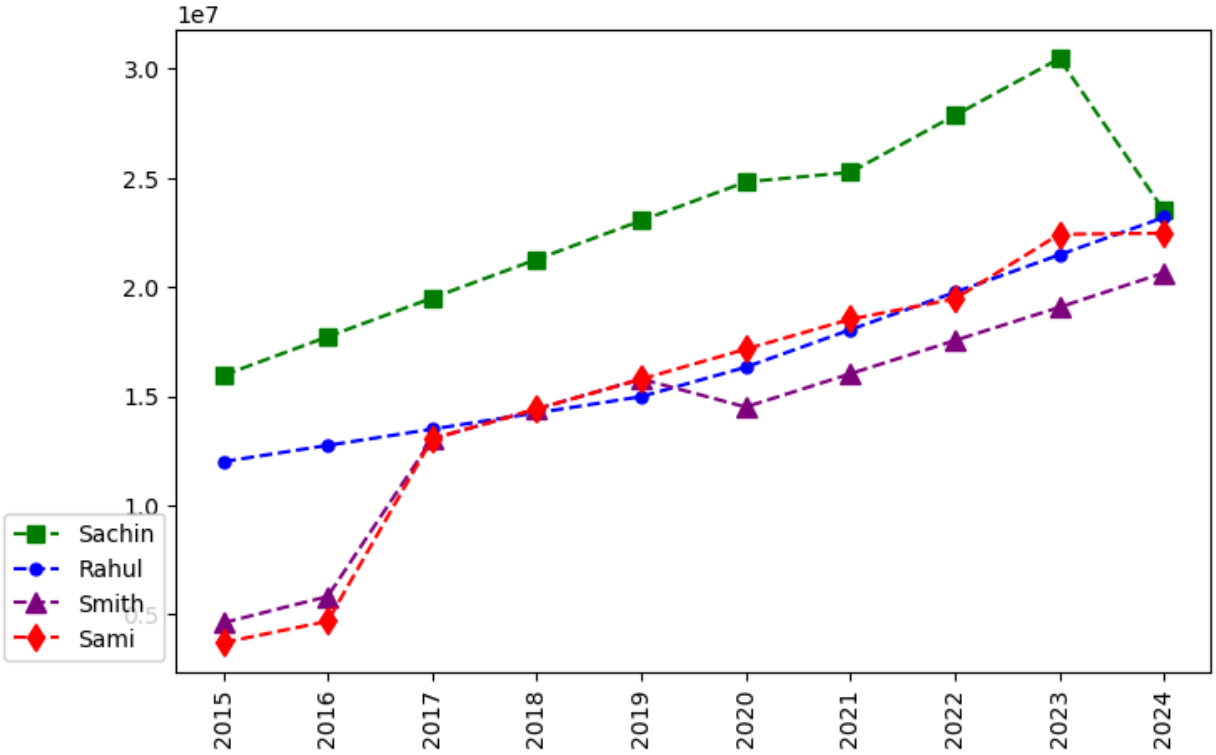
In [65]:
```
plt.plot(Salary[0], c='Green', ls = '--', marker = 's', ms = 7, label = Players
plt.plot(Salary[1], c='Blue', ls = '--', marker = 'o', ms = 5, label = Players
plt.plot(Salary[2], c='purple', ls = '--', marker = '^', ms = 8, label = Playe
plt.plot(Salary[3], c='Red', ls = '--', marker = 'd', ms = 8, label = Players[
#plt.legend(loc = 'upper left',bbox_to_anchor=(0,0) )
plt.legend(loc = 'lower left',bbox_to_anchor=(0,0))
plt.xticks(list(range(0,10)), Seasons,rotation='vertical')

plt.show()
```



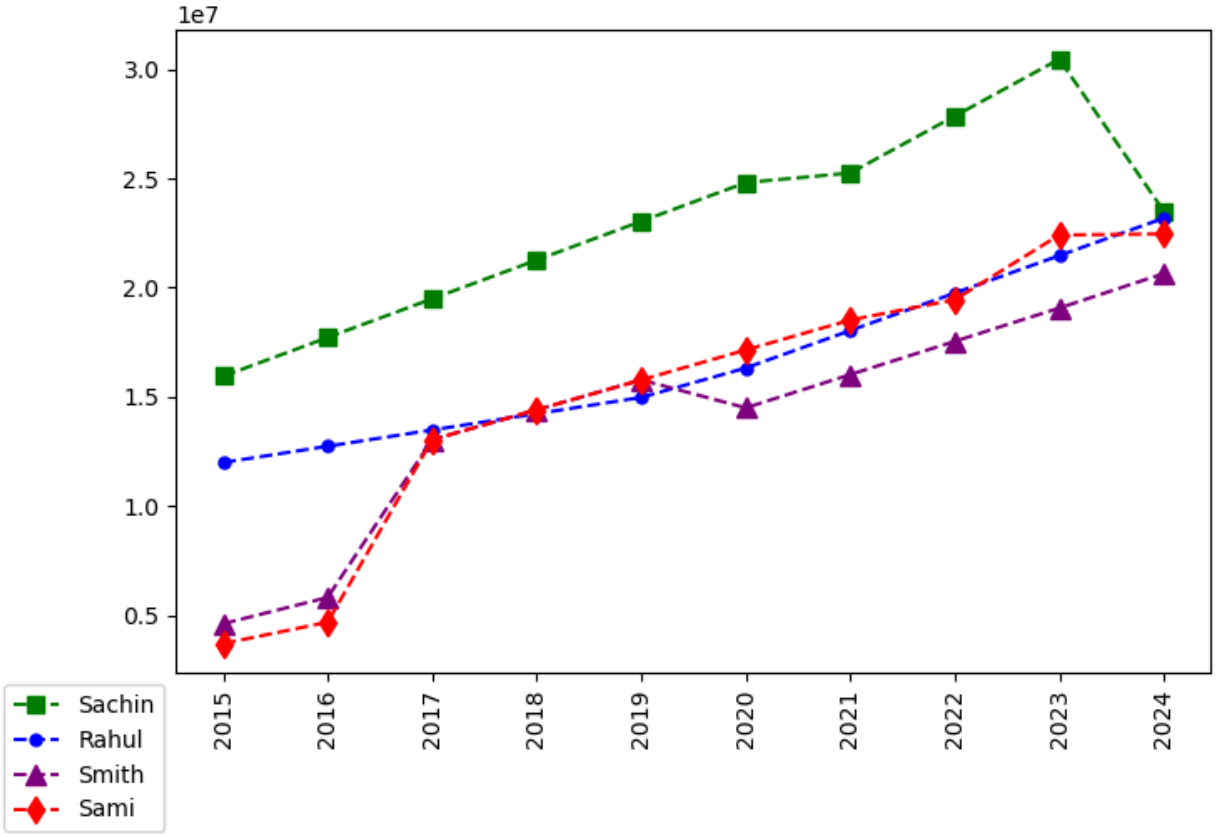
In [66]:
```
plt.plot(Salary[0], c='Green', ls = '--', marker = 's', ms = 7, label = Players
plt.plot(Salary[1], c='Blue', ls = '--', marker = 'o', ms = 5, label = Players
plt.plot(Salary[2], c='purple', ls = '--', marker = '^', ms = 8, label = Playe
plt.plot(Salary[3], c='Red', ls = '--', marker = 'd', ms = 8, label = Players[
#plt.legend(loc = 'upper left',bbox_to_anchor=(0,0) )
plt.legend(loc = 'upper left',bbox_to_anchor=(0,0))
plt.xticks(list(range(0,10)), Seasons,rotation='vertical')

plt.show()
```



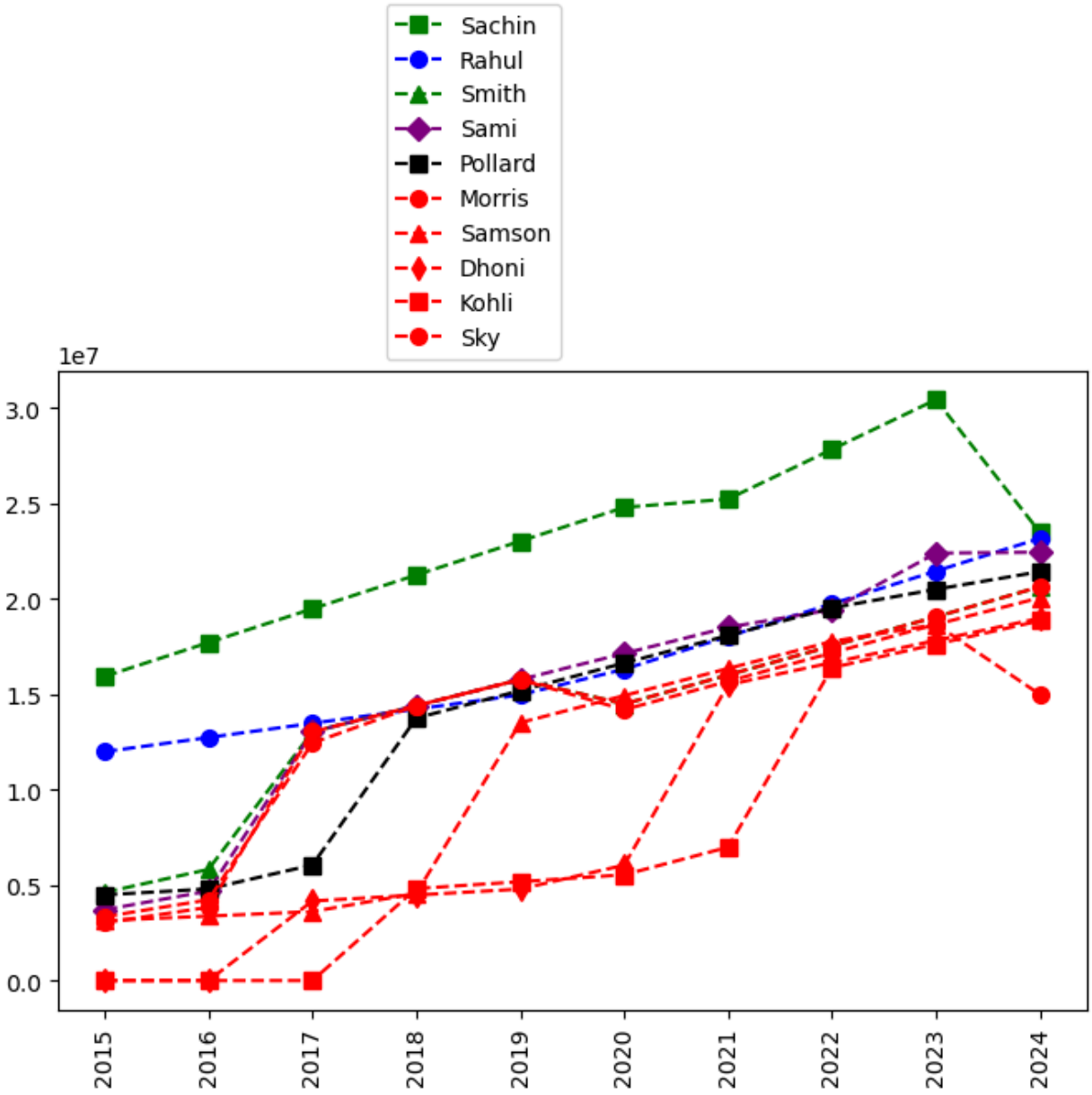
In [67]:
```
plt.plot(Salary[0], c='Green', ls = '--', marker = 's', ms = 7, label = Players
plt.plot(Salary[1], c='Blue', ls = '--', marker = 'o', ms = 5, label = Players
plt.plot(Salary[2], c='purple', ls = '--', marker = '^', ms = 8, label = Playe
plt.plot(Salary[3], c='Red', ls = '--', marker = 'd', ms = 8, label = Players[
#plt.legend(loc = 'upper left',bbox_to_anchor=(0,0) )
plt.legend(loc = 'lower right',bbox_to_anchor=(0,0))
plt.xticks(list(range(0,10)), Seasons,rotation='vertical')

plt.show()
```



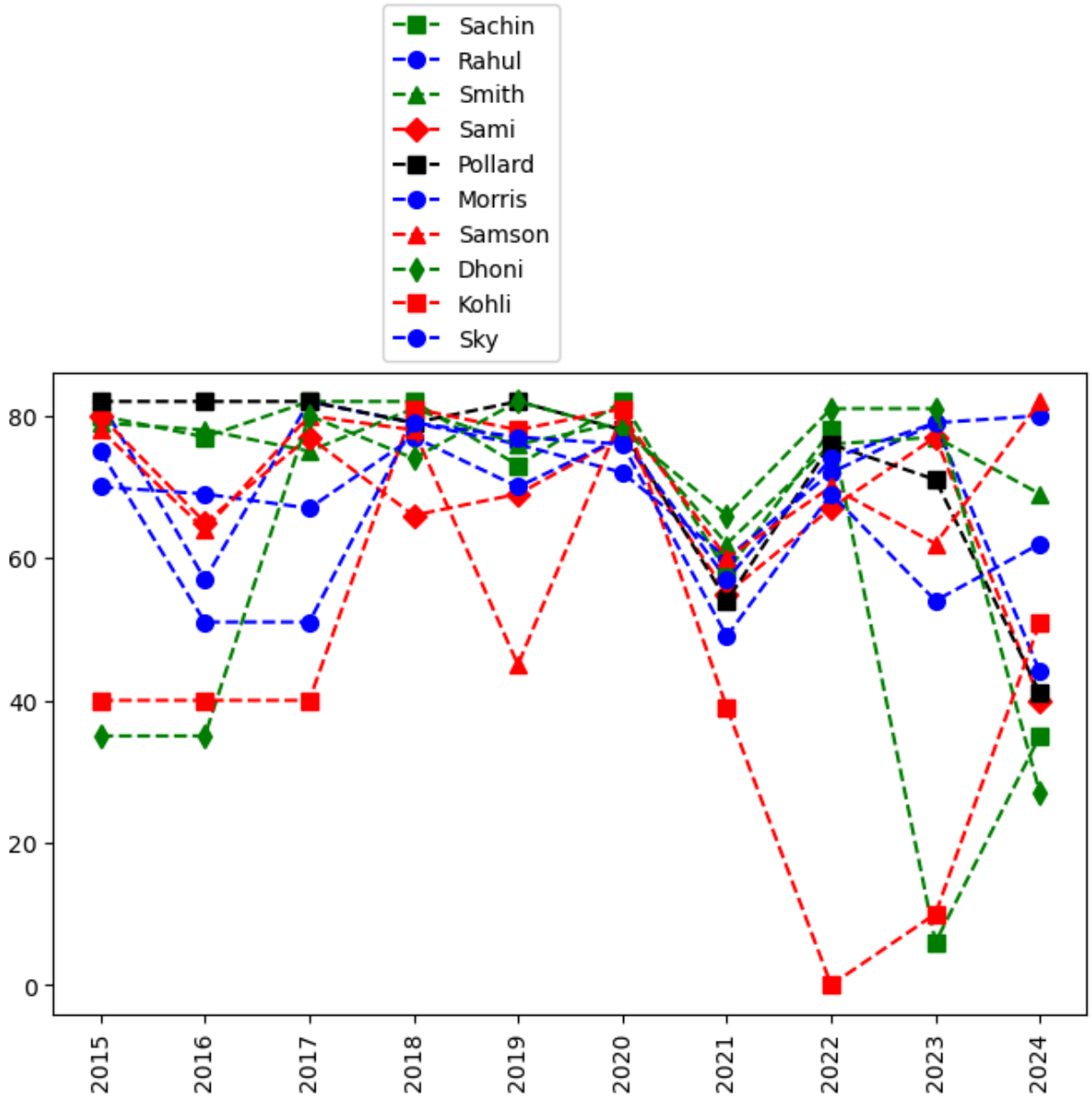
In [68]:
```
plt.plot(Salary[0], c='Green', ls = '--', marker = 's', ms = 7, label = Players
plt.plot(Salary[1], c='Blue', ls = '--', marker = 'o', ms = 5, label = Players
plt.plot(Salary[2], c='purple', ls = '--', marker = '^', ms = 8, label = Playe
plt.plot(Salary[3], c='Red', ls = '--', marker = 'd', ms = 8, label = Players[
plt.legend(loc = 'upper right',bbox_to_anchor=(0,0) )
#plt.legend(loc = 'lower left',bbox_to_anchor=(0,0))
plt.xticks(list(range(0,10)), Seasons,rotation='vertical')

plt.show()
```



In [70]:
```
plt.plot(Salary[0], c='Green', ls = '--', marker = 's', ms = 7, label = Players
plt.plot(Salary[1], c='Blue', ls = '--', marker = 'o', ms = 7, label = Players
plt.plot(Salary[2], c='Green', ls = '--', marker = '^', ms = 7, label = Players
plt.plot(Salary[3], c='Purple', ls = '--', marker = 'D', ms = 7, label = Playe
plt.plot(Salary[4], c='Black', ls = '--', marker = 's', ms = 7, label = Players
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 [71]:
```
# we can visualize the how many games played by a player

plt.plot(Games[0], c='Green', ls = '--', marker = 's', ms = 7, label = Players
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
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
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
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 doesn't mater) (keys & values) 4>visualizaing using pyplot 5>IPL analysis