

IPL Data Analysis Project

August 13, 2025

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

```
[2]: #Seasons
Seasons =_
    ["2010","2011","2012","2013","2014","2015","2016","2017","2018","2019"]
Sdict = {"2010":0,"2011":1,"2012":2,"2013":3,"2014":4,"2015":5,"2016":6,"2017":
    7,"2018":8,"2019":9}

#Players
Players =_
    ["Sachin","Rahul","Smith","Sami","Pollard","Morris","Samson","Dhoni","Kohli","Sky"]
Pdict = {"Sachin":0,"Rahul":1,"Smith":2,"Sami":3,"Pollard":4,"Morris":
    5,"Samson":6,"Dhoni":7,"Kohli":8,"Sky":9}

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

```

Salary = np.array([Sachin_Salary, Rahul_Salary, Smith_Salary, Sami_Salary,
↳Pollard_Salary, Morris_Salary, Samson_Salary, Dhoni_Salary, Kohli_Salary,
↳Sky_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, Dhoni_G, Kohli_G, Sky_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, Dhoni_PTS, Kohli_PTS, Sky_PTS])

```

[3]: Seasons

```

[3]: ['2010',
      '2011',
      '2012',
      '2013',
      '2014',
      '2015',
      '2016',
      '2017',
      '2018',
      '2019']

```

[8]: Salary

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

[5]: Games

```
[5]: 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]])
```

[10]: Points

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

```
[11]: Pdict
```

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

```
[12]: Salary/Games
```

```
/var/folders/w8/5124_l8n1md8s19brt04j5mr0000gn/T/ipykernel_62039/3709746658.py:1  
: RuntimeWarning: divide by zero encountered in divide  
Salary/Games
```

```
[12]: 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]])

```

```
[13]: Salary//Games
```

```

/var/folders/w8/5124_l8n1md8s19brt04j5mr0000gn/T/ipykernel_62039/1634212085.py:1
: RuntimeWarning: divide by zero encountered in floor_divide
Salary//Games

```

```

[13]: array([[ 199335,  230113,  237690,  259298,  315539,  302515,  435249,
          357040,  5075634,  671428],
 [ 146341,  223582,  164492,  180159,  197062,  226729,  300642,
          274342,  271730,  289759],
 [  58503,   74719,  173883,  177908,  207630,  183544,  258427,
          230855,  247629,  299194],
 [  46420,   72216,  169366,  218342,  228694,  222717,  336701,
          290298,  291006,  561450],
 [  54794,   58618,   73917,  174151,  185397,  213425,  335032,
          257057,  288918,  522835],
 [  47828,   61380,  185895,  187150,  225427,  188311,  281096,
          237094,  241360,  469190],
 [  40310,   52815,   45199,   58643,  300455,  186751,  272663,
          253992,  301103,  244738],
 [    0,    0,   52140,   60595,   58498,   77611,  234948,
          205797,  220155,  703541],
 [    0,    0,    0,   59540,   66467,   68471,  179325,
           0, 1763268,  369860],
 [  40425,   75322,  255710,  182412,  204933,  186842,  320224,
          249014,  345796,  241935]])

```

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

```

/var/folders/w8/5124_l8n1md8s19brt04j5mr0000gn/T/ipykernel_62039/3663165759.py:1
: RuntimeWarning: divide by zero encountered in floor_divide
np.round(Salary//Games)

```

```
[14]: array([[ 199335,  230113,  237690,  259298,  315539,  302515,  435249,
              357040, 5075634,  671428],
            [ 146341,  223582,  164492,  180159,  197062,  226729,  300642,
              274342,  271730,  289759],
            [  58503,   74719,  173883,  177908,  207630,  183544,  258427,
              230855,  247629,  299194],
            [  46420,   72216,  169366,  218342,  228694,  222717,  336701,
              290298,  291006,  561450],
            [  54794,   58618,   73917,  174151,  185397,  213425,  335032,
              257057,  288918,  522835],
            [  47828,   61380,  185895,  187150,  225427,  188311,  281096,
              237094,  241360,  469190],
            [  40310,   52815,   45199,   58643,  300455,  186751,  272663,
              253992,  301103,  244738],
            [     0,     0,   52140,   60595,   58498,   77611,  234948,
              205797,  220155,  703541],
            [     0,     0,     0,   59540,   66467,   68471,  179325,
               0, 1763268,  369860],
            [  40425,   75322,  255710,  182412,  204933,  186842,  320224,
              249014,  345796,  241935]])
```

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

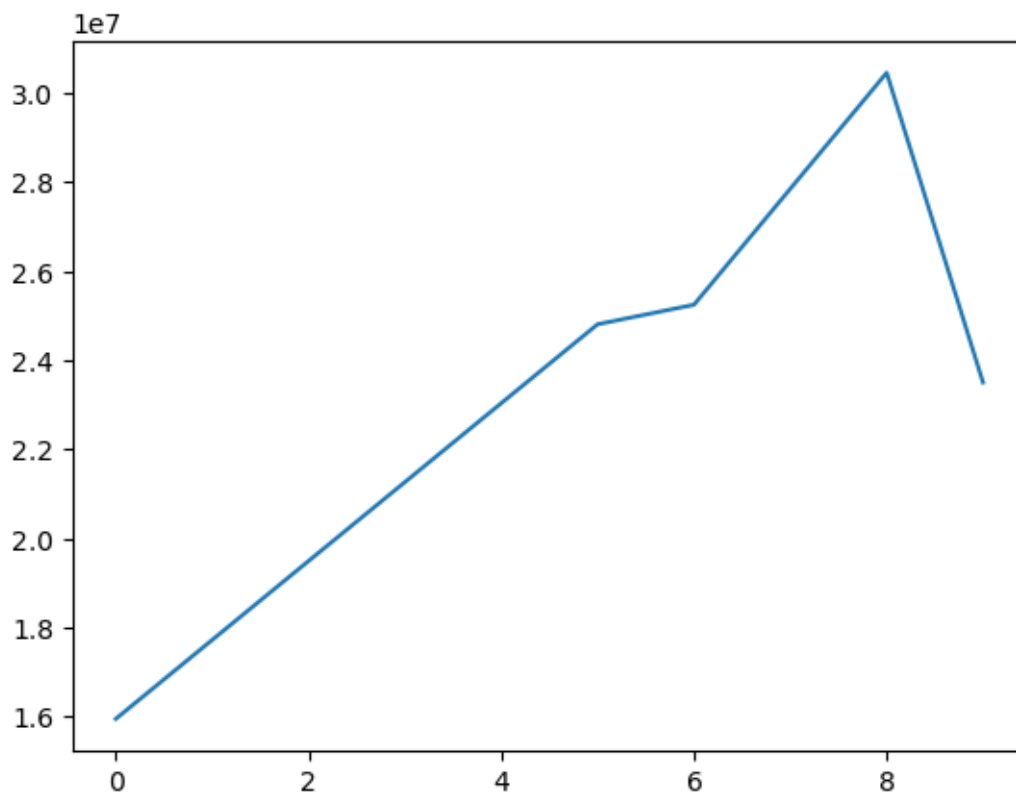
```
[16]: import matplotlib.pyplot as plt
```

```
[17]: Salary[0]
```

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

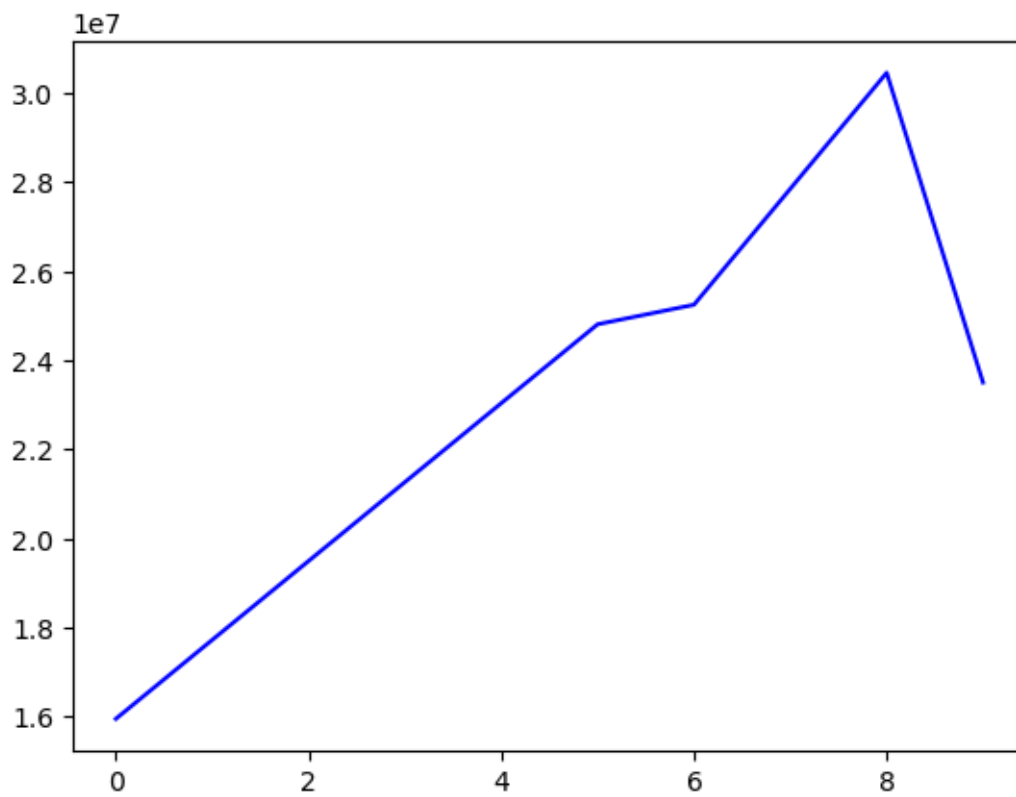
```
[18]: plt.plot(Salary[0])
```

```
[18]: [<matplotlib.lines.Line2D at 0x1366039d0>]
```



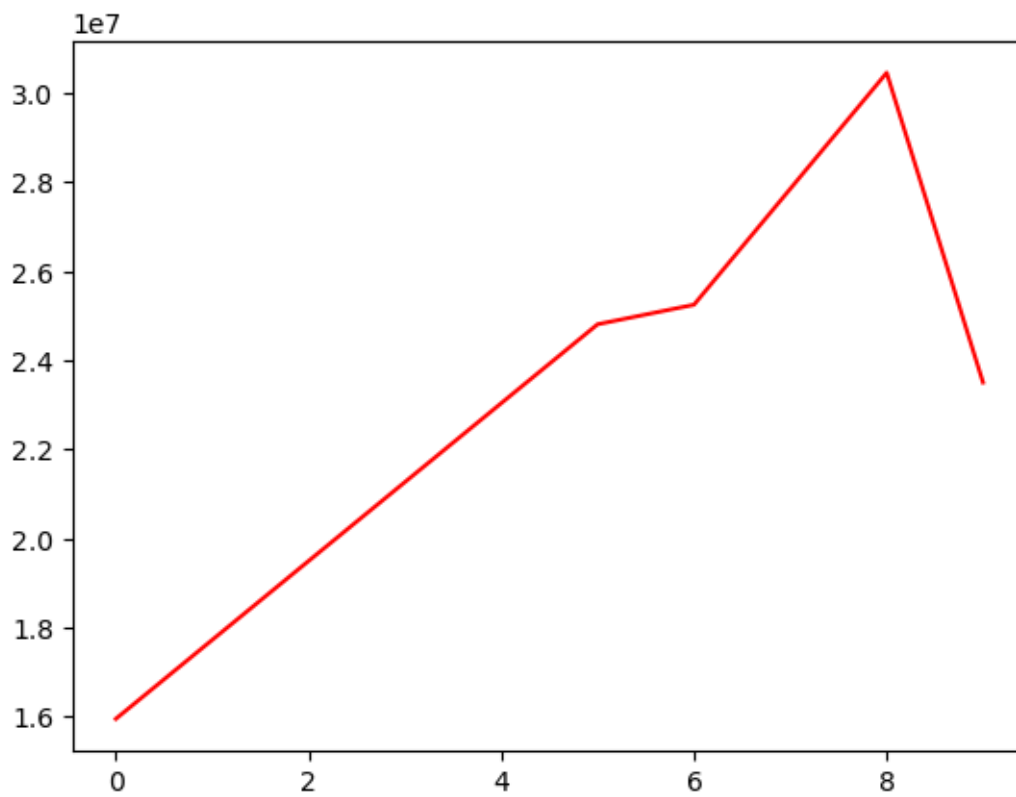
```
[19]: plt.plot(Salary[0], c = 'b')
```

```
[19]: [<matplotlib.lines.Line2D at 0x136935a90>]
```



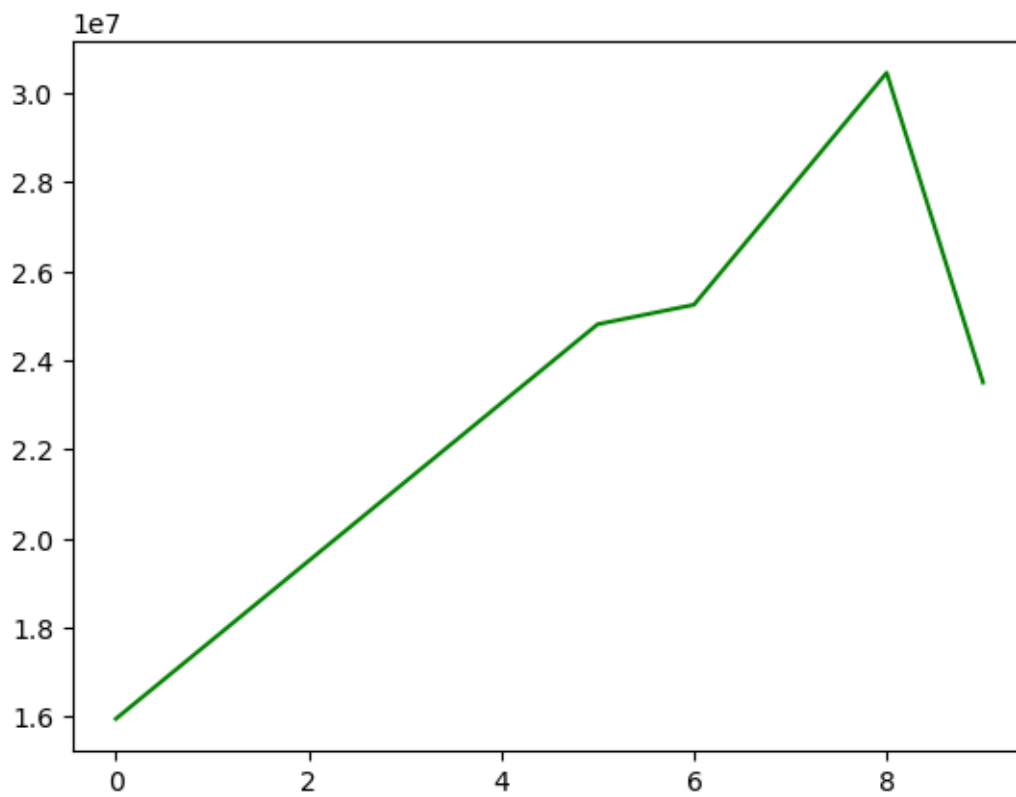
```
[20]: plt.plot(Salary[0], c = 'r')
```

```
[20]: [<matplotlib.lines.Line2D at 0x1369b4a50>]
```

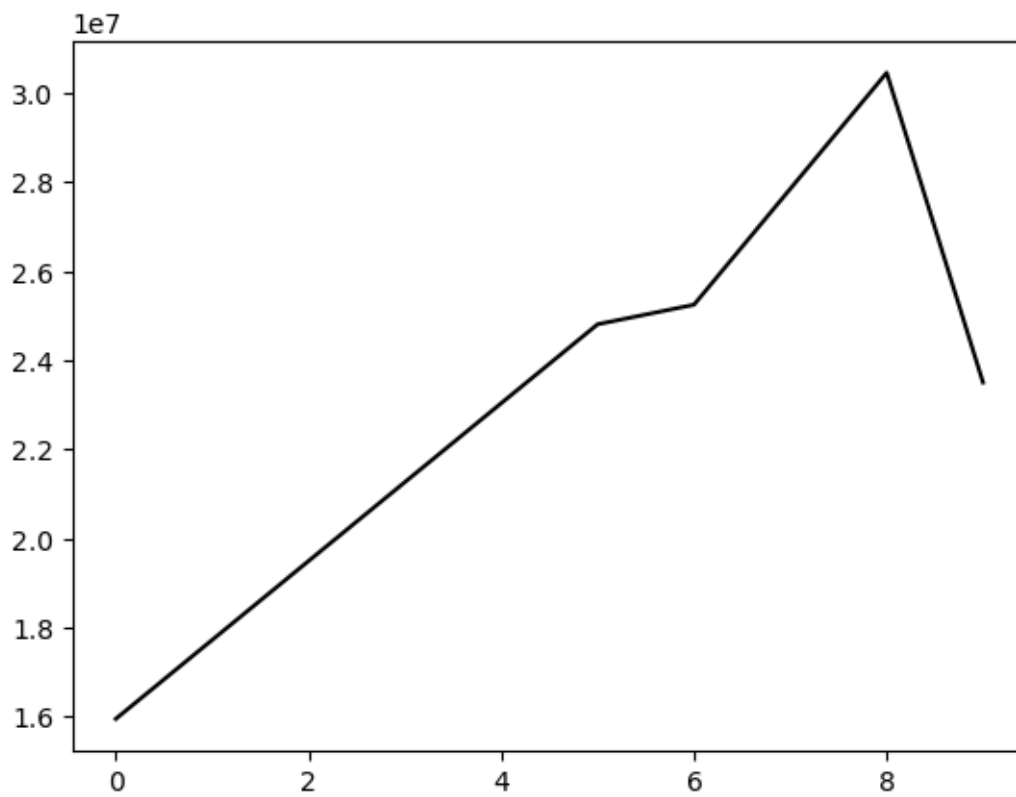
```
[21]: plt.plot(Salary[0], c = 'g')
```

```
[21]: [<matplotlib.lines.Line2D at 0x136a16fd0>]
```



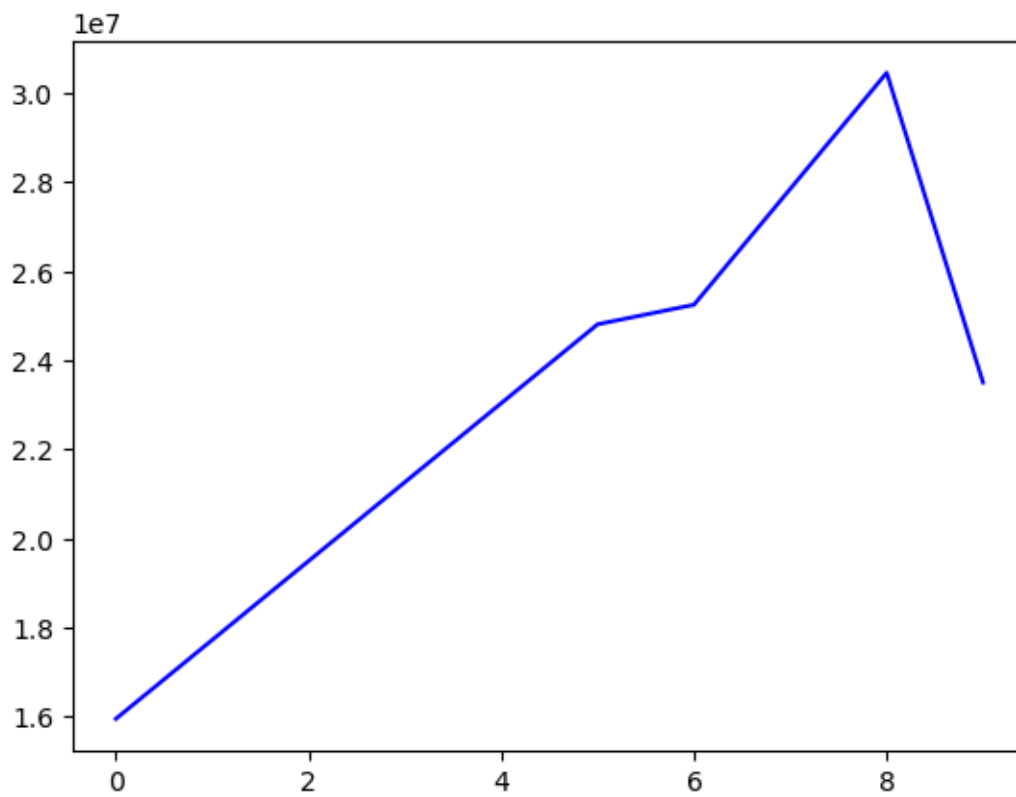
```
[22]: plt.plot(Salary[0], c = 'k')
```

```
[22]: [<matplotlib.lines.Line2D at 0x136aa5590>]
```



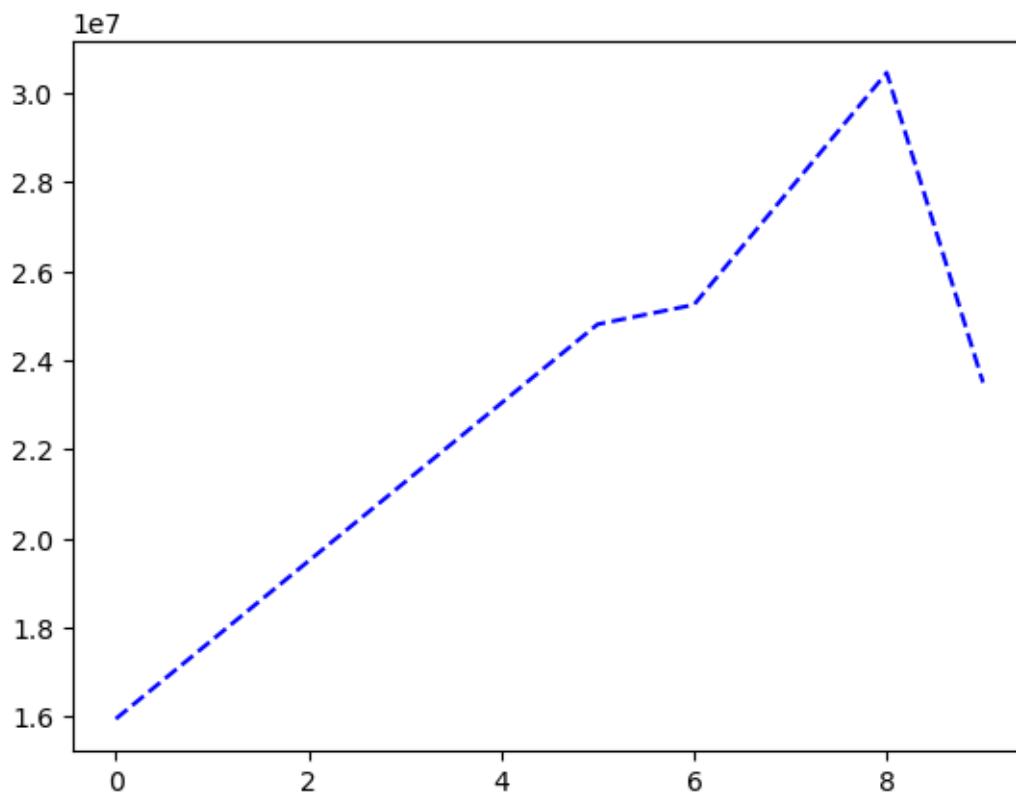
```
[23]: plt.plot(Salary[0], c = 'b')
```

```
[23]: [<matplotlib.lines.Line2D at 0x136affb10>]
```



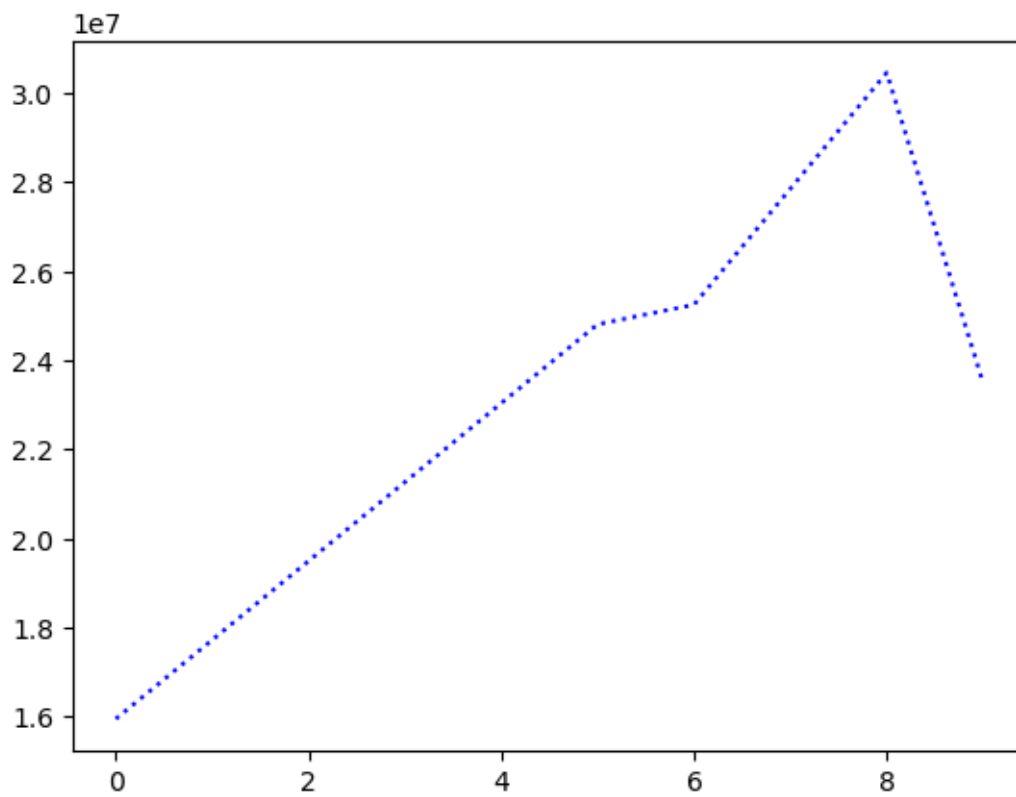
```
[24]: plt.plot(Salary[0], c = 'b', ls = '--')
```

```
[24]: [<matplotlib.lines.Line2D at 0x136b9a0d0>]
```



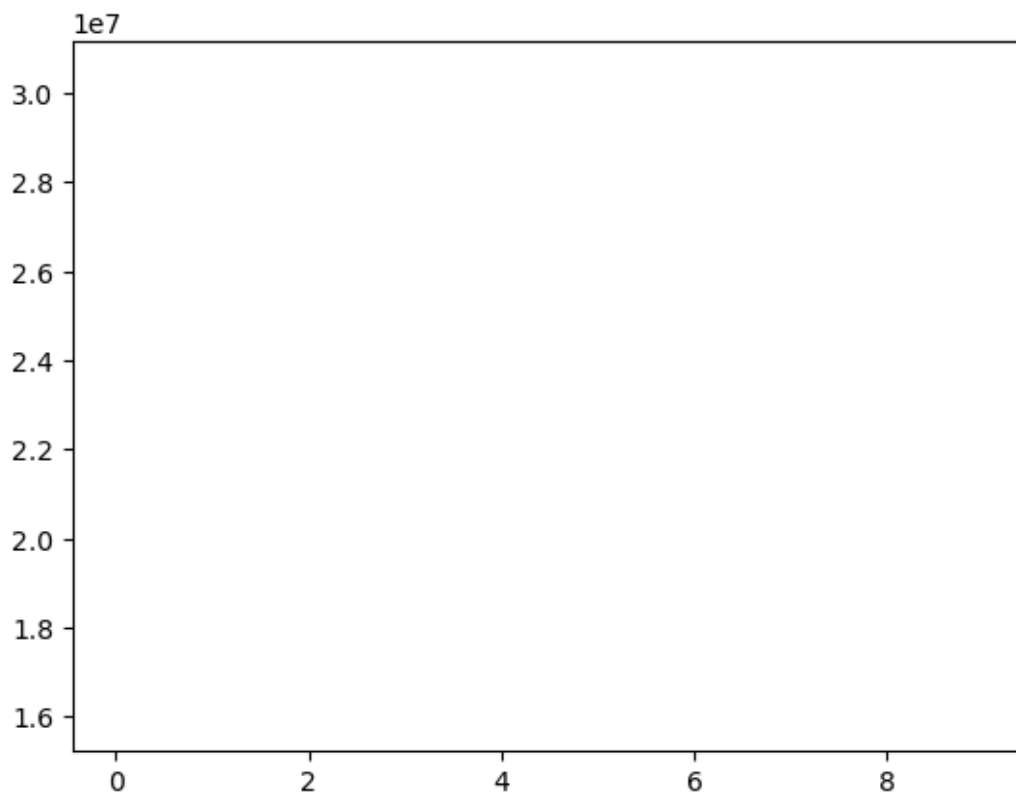
```
[25]: plt.plot(Salary[0], c = 'b', ls = ':')
```

```
[25]: [<matplotlib.lines.Line2D at 0x136c287d0>]
```



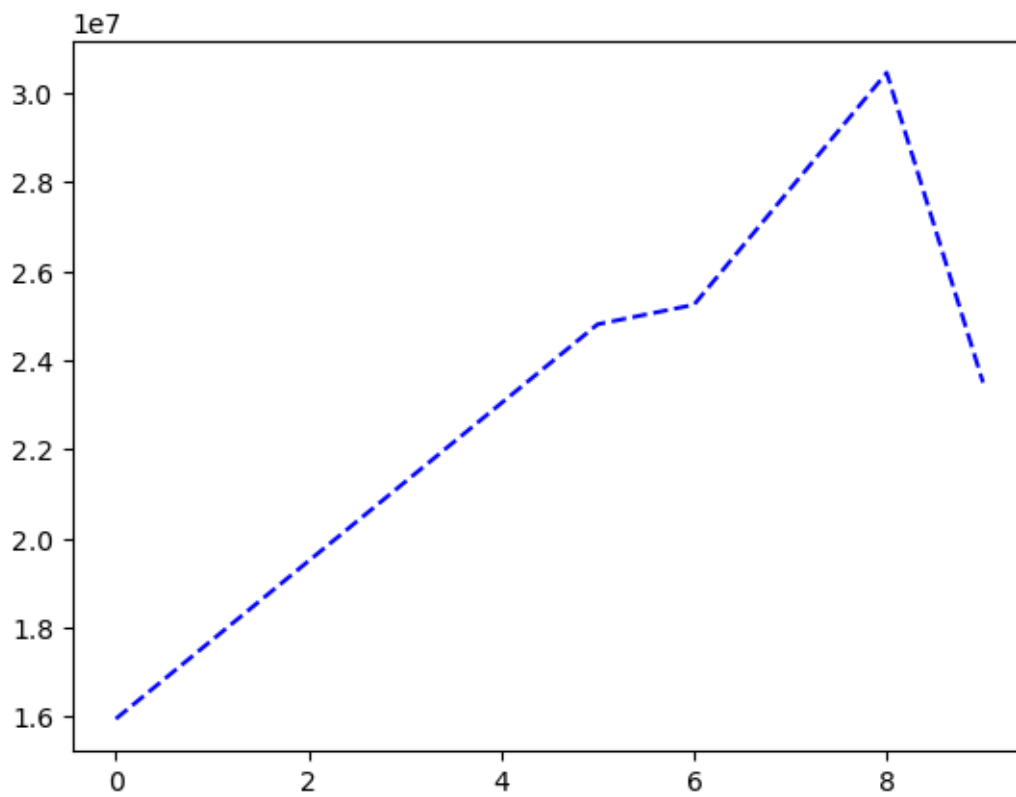
```
[26]: plt.plot(Salary[0], c = 'b', ls = 'none')
```

```
[26]: [<matplotlib.lines.Line2D at 0x136c7ed50>]
```



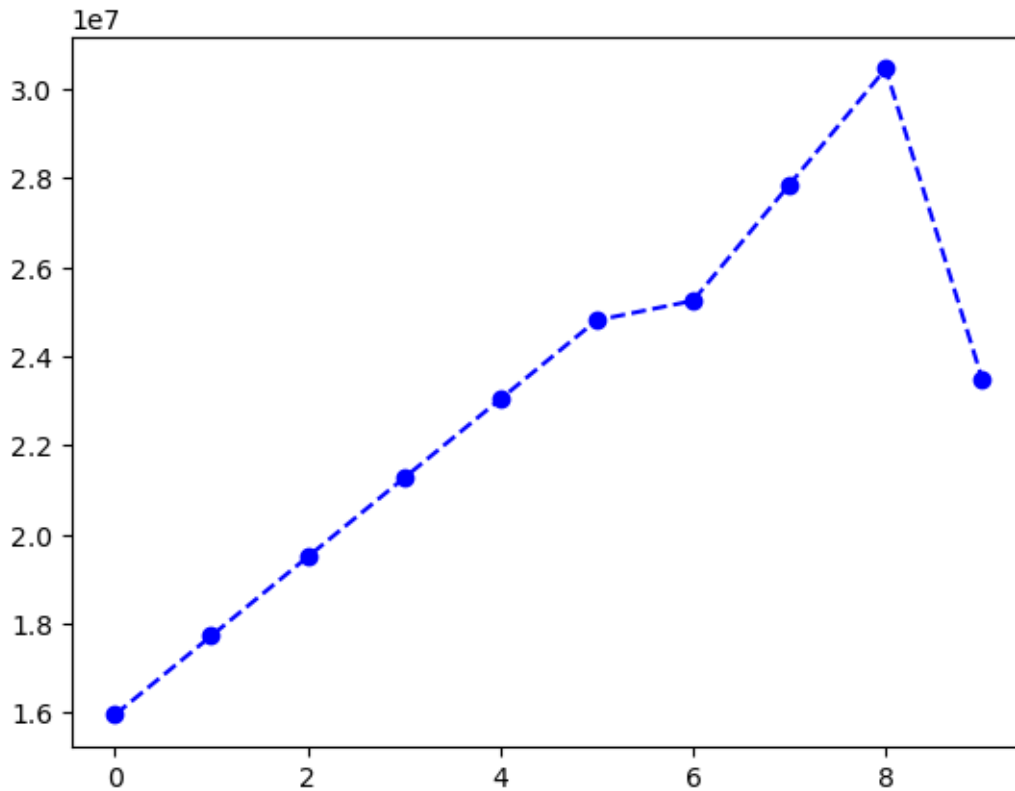
```
[27]: plt.plot(Salary[0], c = 'b', ls = '--')
```

```
[27]: [<matplotlib.lines.Line2D at 0x136d15310>]
```



```
[28]: plt.plot(Salary[0], c = 'b', ls = '--', marker = 'o')
```

```
[28]: [<matplotlib.lines.Line2D at 0x136d67890>]
```

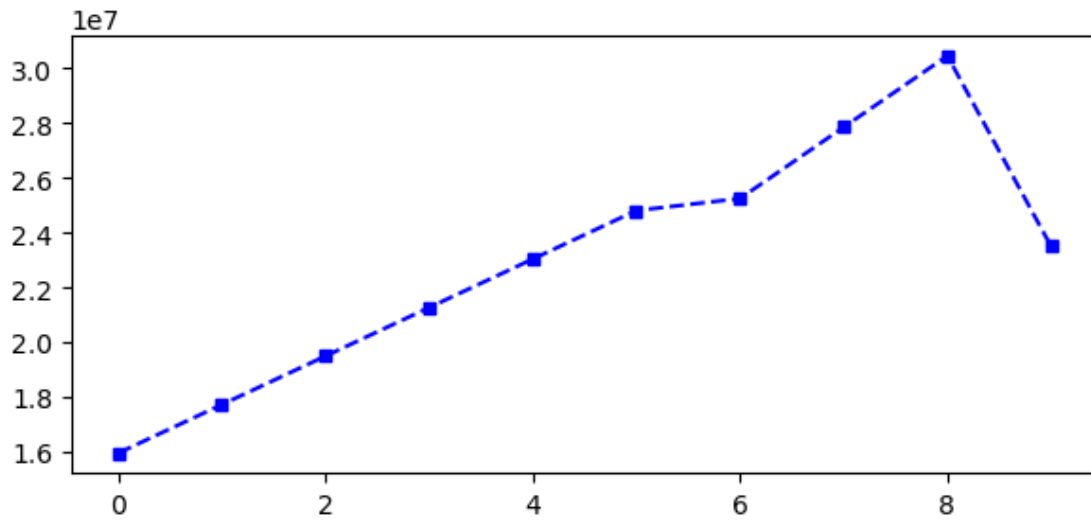
```
[ ]: # The salary is increasing but last year decreased. Linear trend and downward trend
```

```
[29]: Games[0]
```

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

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

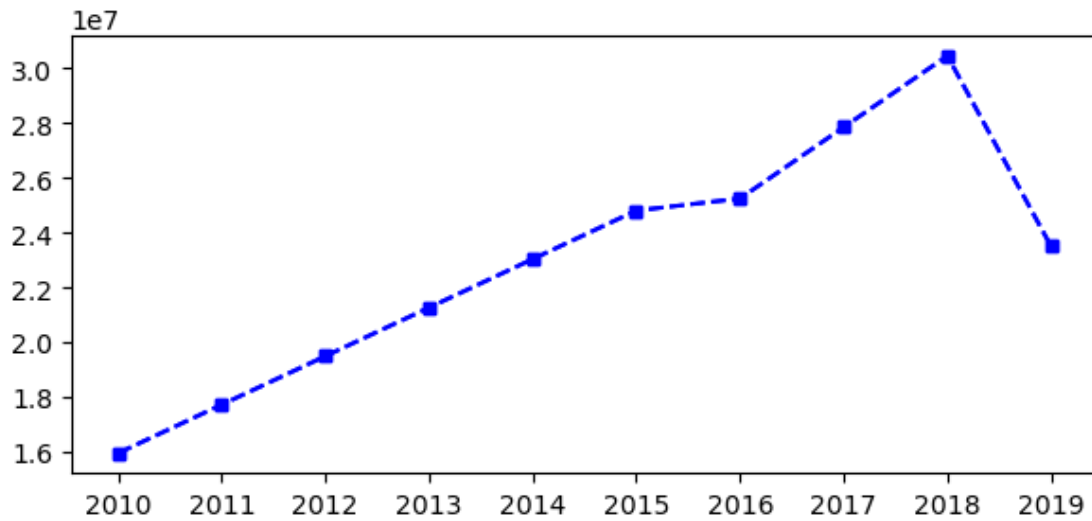
```
[39]: plt.plot(Salary[0], c = 'b', ls = '--', marker = 's', ms = 5)
plt.show()
```



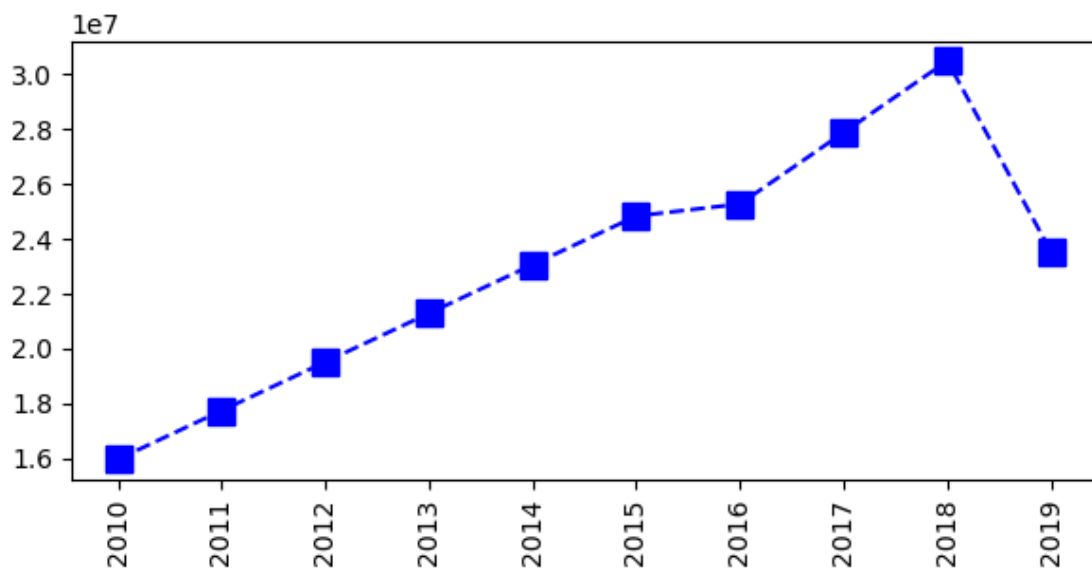
```
[40]: Sdict
```

```
[40]: {'2010': 0,  
      '2011': 1,  
      '2012': 2,  
      '2013': 3,  
      '2014': 4,  
      '2015': 5,  
      '2016': 6,  
      '2017': 7,  
      '2018': 8,  
      '2019': 9}
```

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



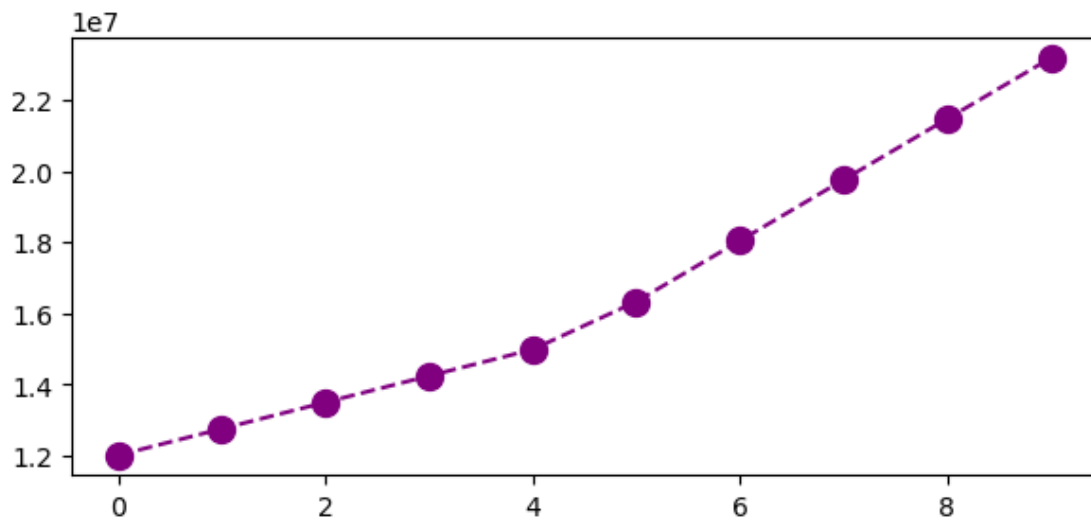
```
[47]: plt.plot(Salary[0], c = 'b', ls = '--', marker = 's', ms = 10)
plt.xticks(list(range(0,10)),Seasons,rotation = 'vertical')
plt.show()
```



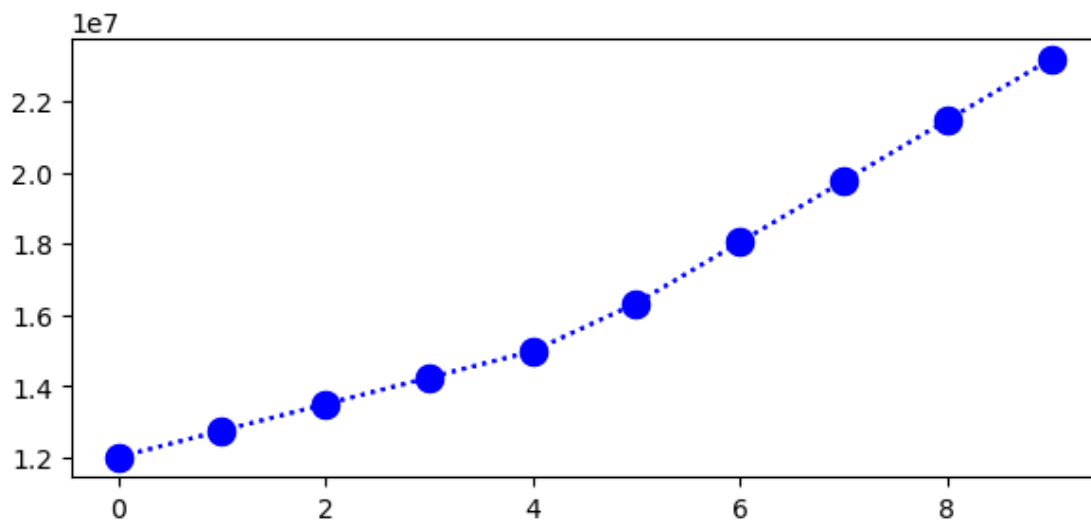
```
[44]: Salary[1]
```

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

```
[46]: plt.plot(Salary[1], c = 'purple', ls = '--', marker = 'o', ms = 10)
plt.show()
```

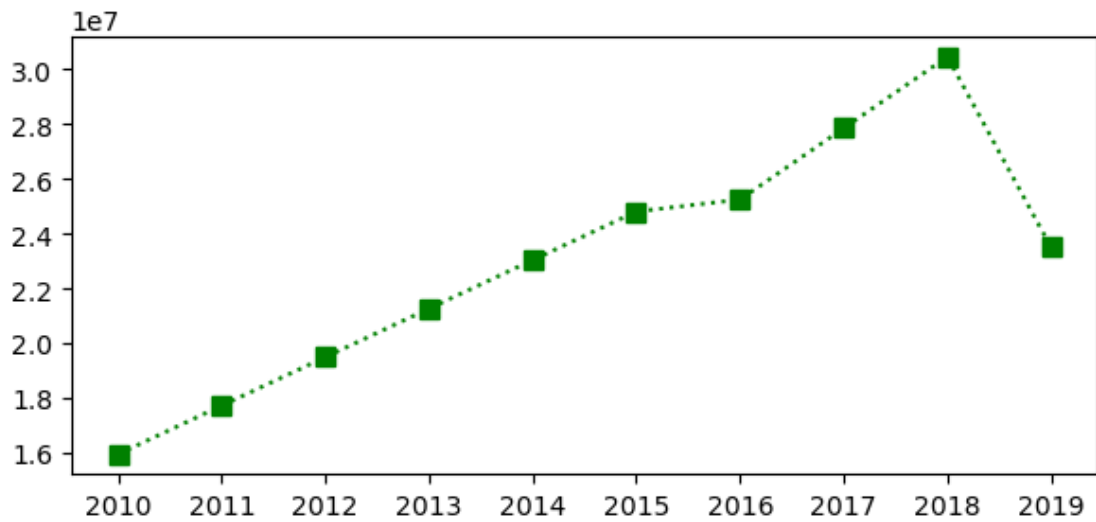


```
[49]: plt.plot(Salary[1], c='Blue', ls = ':', marker = 'o', ms = 10, label = "
↳Players[1])
plt.show()
```

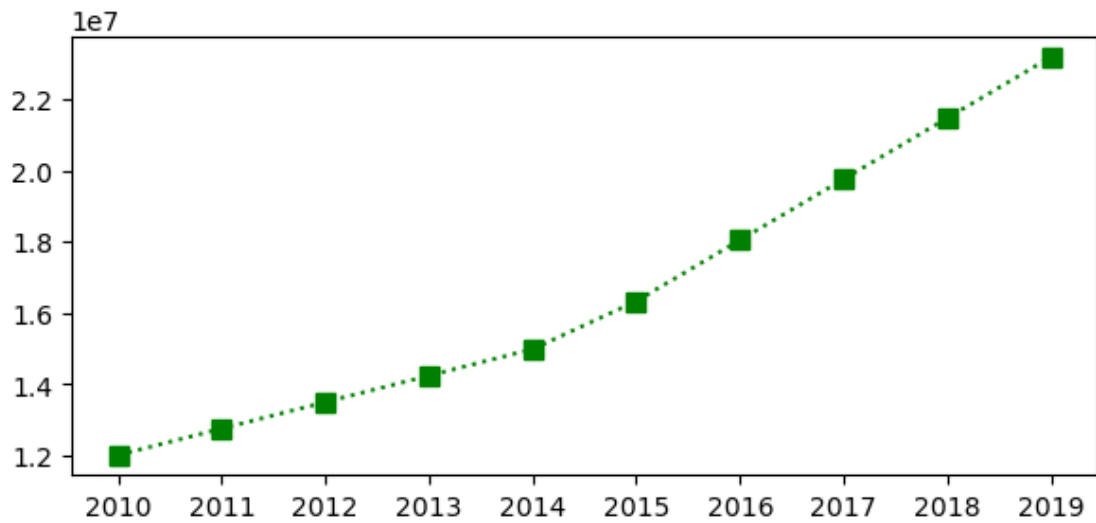


```
[50]: plt.plot(Salary[0], c='Green', ls = ':', marker = 's', ms = 7, label = "
↳Players[0])
plt.xticks(list(range(0,10)), Seasons,rotation='horizontal')
```

```
plt.show()
```



```
[51]: plt.plot(Salary[1], c='Green', ls = ':', marker = 's', ms = 7, label = ↵  
        ↵Players[1])  
plt.xticks(list(range(0,10)), Seasons,rotation='horizontal')  
plt.show()
```

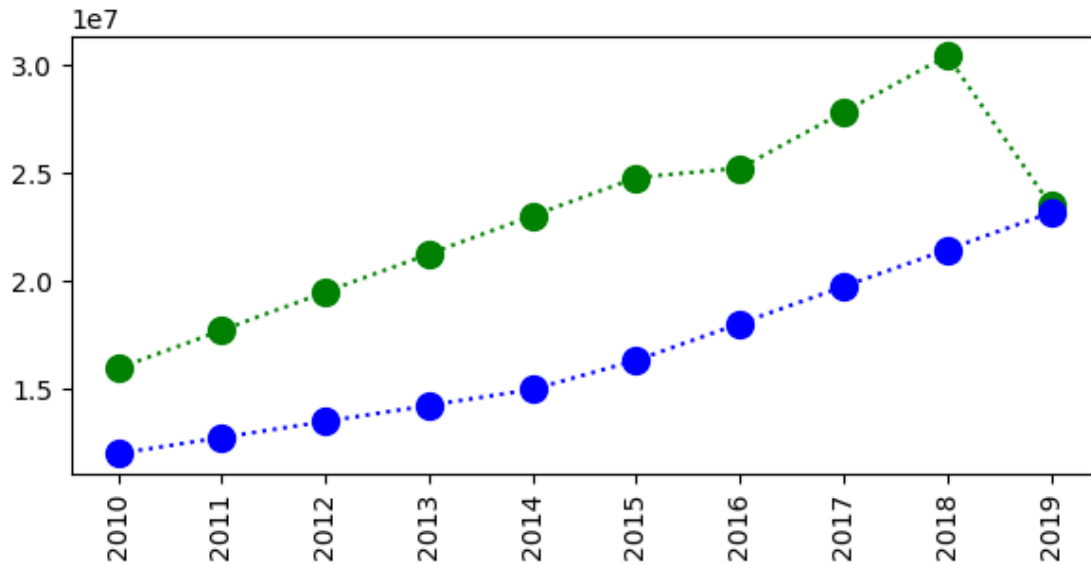


```
[54]: plt.plot(Salary[0], c='Green', ls = ':', marker = 'o', ms = 10, label = ↵  
        ↵Players[0])
```

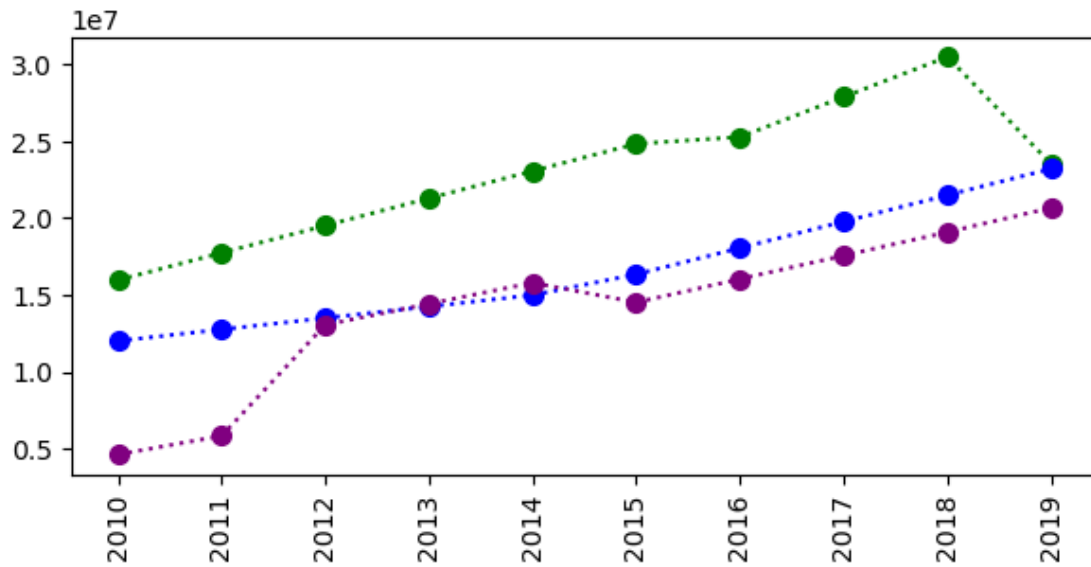
```
plt.plot(Salary[1], c='Blue', ls = ':', marker = 'o', ms = 10, label = Players[1])

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

plt.show()
```



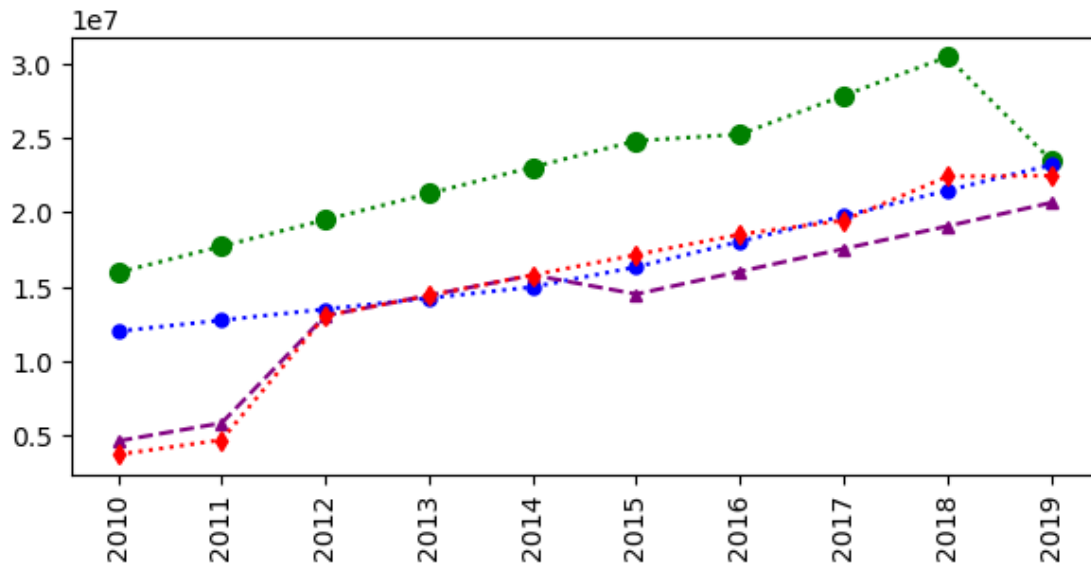
```
[57]: plt.plot(Salary[0], c='Green', ls = ':', marker = 'o', ms = 7, label = Players[0])
plt.plot(Salary[1], c='Blue', ls = ':', marker = 'o', ms = 7, label = Players[1])
plt.plot(Salary[2], c='Purple', ls = ':', marker = 'o', ms = 7, label = Players[2])
plt.xticks(list(range(0,10)), Seasons,rotation='vertical')
plt.show()
```



```
[59]: plt.plot(Salary[0], c='Green', ls = ':', marker = 'o', 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 = 5, label = Players[2])
      plt.plot(Salary[3], c='Red', ls = ':', marker = 'd', ms = 5, label = Players[3])

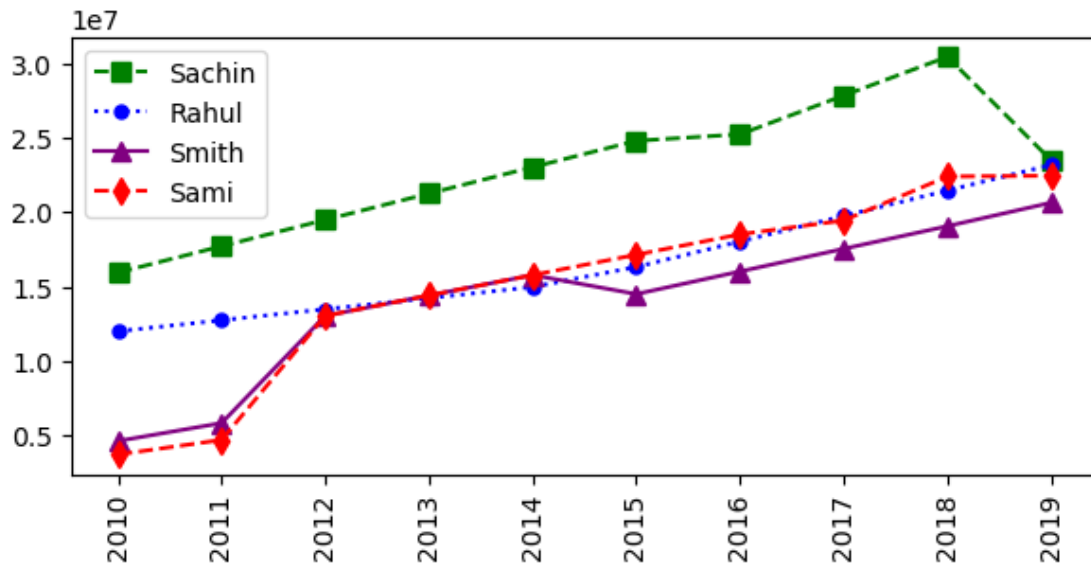
      plt.xticks(list(range(0,10)), Seasons,rotation='vertical')

      plt.show()
```



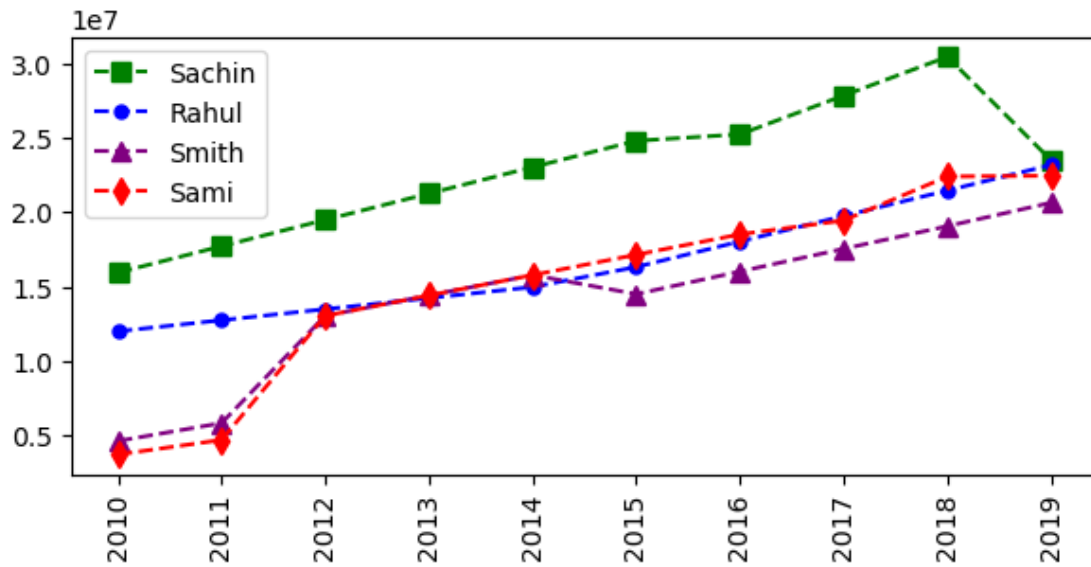
```
[63]: plt.plot(Salary[0], c='Green', ls = '--', marker = 's', ms = 7, label = "↳Players[0]")
plt.plot(Salary[1], c='Blue', ls = ':', marker = 'o', ms = 5, label = "↳Players[1]")
plt.plot(Salary[2], c='purple', ls = '-', marker = '^', ms = 7, label = "↳Players[2]")
plt.plot(Salary[3], c='Red', ls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

plt.show()
```

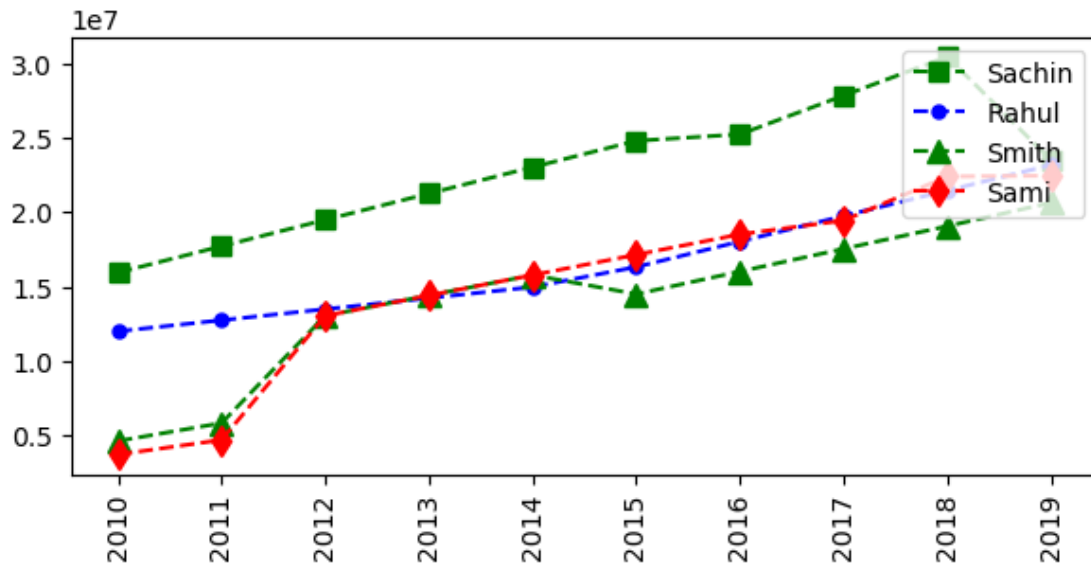
```
[80]: plt.plot(Salary[0], c='Green', ls = '--', marker = 's', ms = 7, label = Players[0])
      plt.plot(Salary[1], c='Blue', ls = '--', marker = 'o', ms = 5, label = Players[1])
      plt.plot(Salary[2], c='purple', ls = '--', marker = '^', ms = 7, label = Players[2])
      plt.plot(Salary[3], c='Red',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

      plt.show()
```



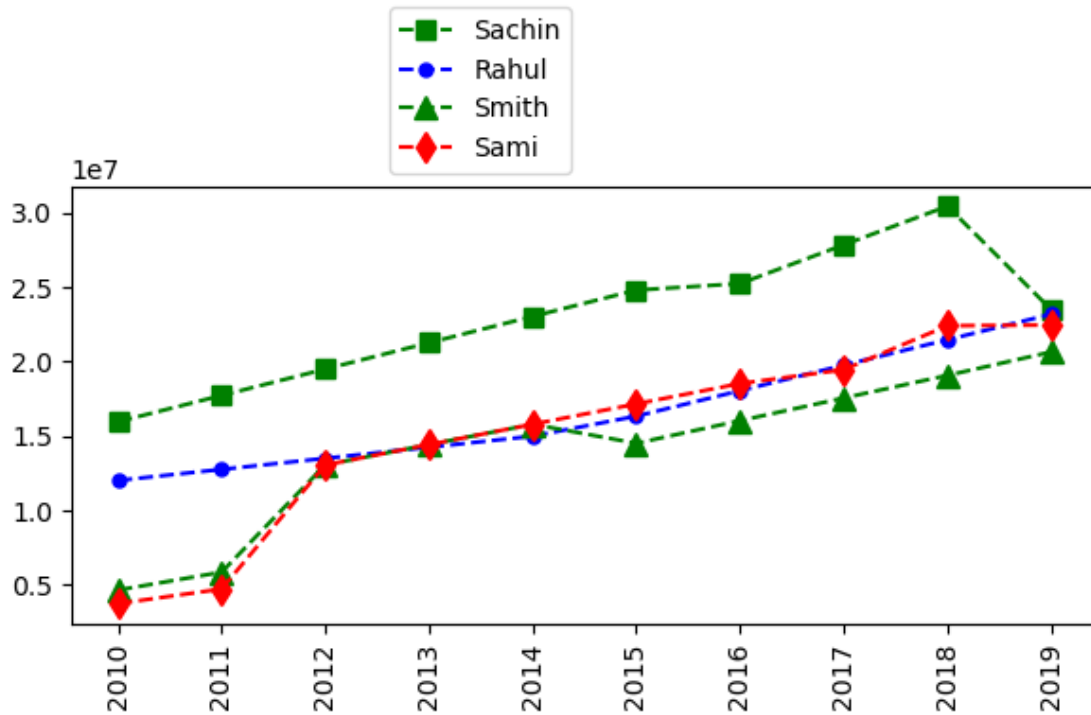
```
[97]: plt.plot(Salary[0], c='Green', ls = '--', marker = 's', ms = 7, label = Players[0])
      plt.plot(Salary[1], c='Blue', ls = '--', marker = 'o', ms = 5, label = Players[1])
      plt.plot(Salary[2], c='Green', ls = '--', marker = '^', ms = 8, label = Players[2])
      plt.plot(Salary[3], c='Red',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

      plt.show()
```



```
[98]: 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')

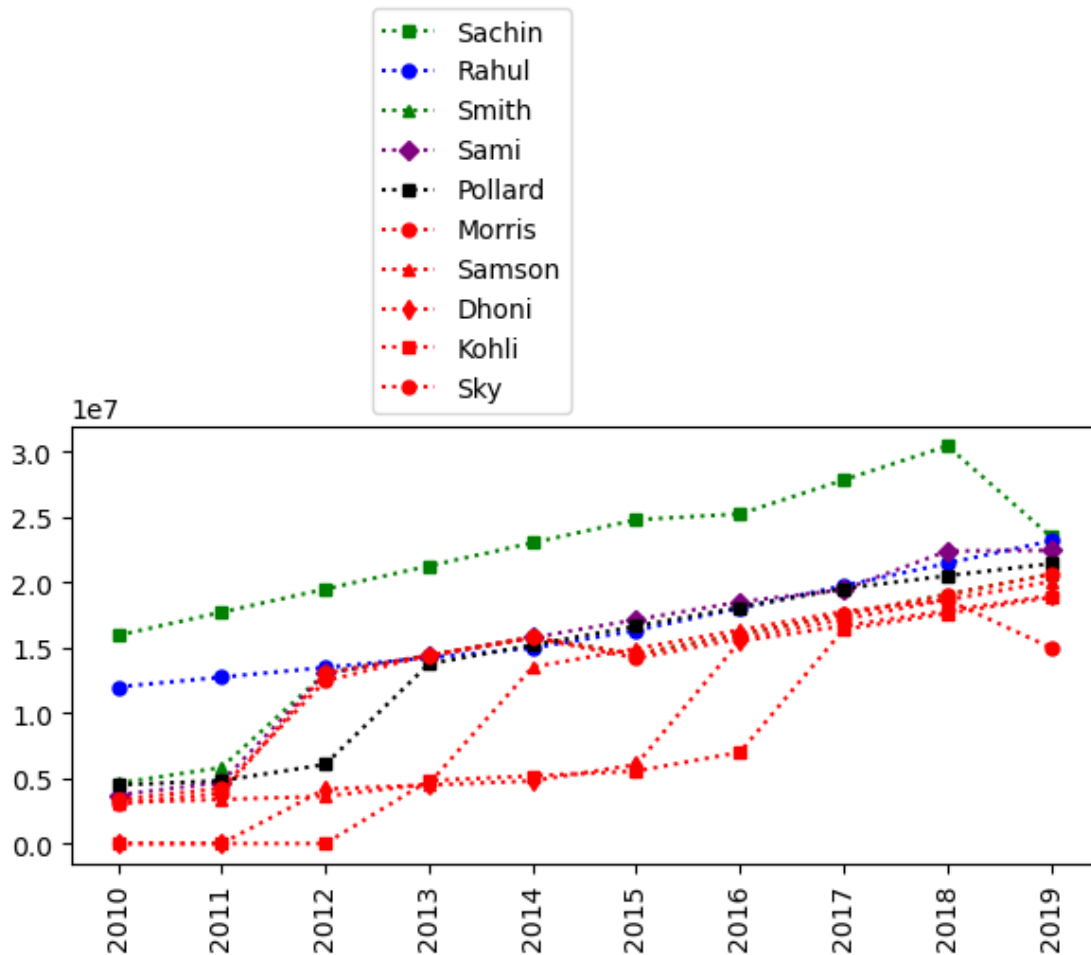
plt.show()
```



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



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

