

In [1]:

```
#Import numpy
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","Pandya"]
Pdict = {"Sachin":0,"Rahul":1,"Smith":2,"Sami":3,"Pollard":4,"Morris":5,"Samson":6,"Dhoni":7,"Pandya":8

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

In [2]:

Salary

```
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]: Games[1]
```

```
Out[4]: array([82, 57, 82, 79, 76, 72, 60, 72, 79, 80])
```

```
In [5]: Games[:,6]
```

```
Out[5]: array([58, 60, 62, 55, 54, 57, 60, 66, 39, 49])
```

```
In [6]: Salary
```

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

```
Out[7]: 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 [8]: Salary//Games

```
C:\Users\sachi\AppData\Local\Temp\ipykernel_8216\1539389292.py:1: RuntimeWarning:
divide by zero encountered in floor_divide
    Salary//Games
```

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

In [9]: `np.round(Salary//Games)`

```
C:\Users\sachi\AppData\Local\Temp\ipykernel_8216\3663165759.py:1: RuntimeWarning:
divide by zero encountered in floor_divide
np.round(Salary//Games)
```

Out[9]: `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]])`

In [10]: `import warnings
warnings.filterwarnings('ignore')
#we are using above code to ignore unknown error due to by os update on monthly`

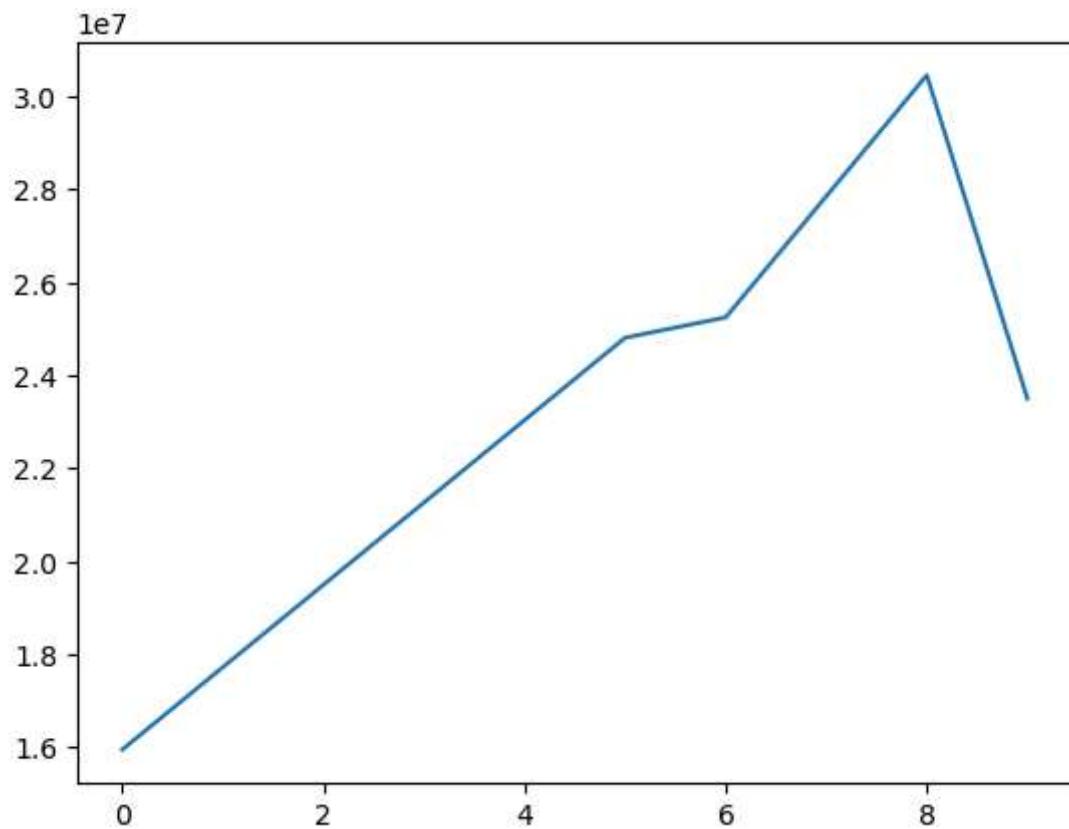
In [11]: `import matplotlib.pyplot as plt
import numpy as np`

In [12]: `Salary[0]`

Out[12]: `array([15946875, 17718750, 19490625, 21262500, 23034375, 24806250,
 25244493, 27849149, 30453805, 23500000])`

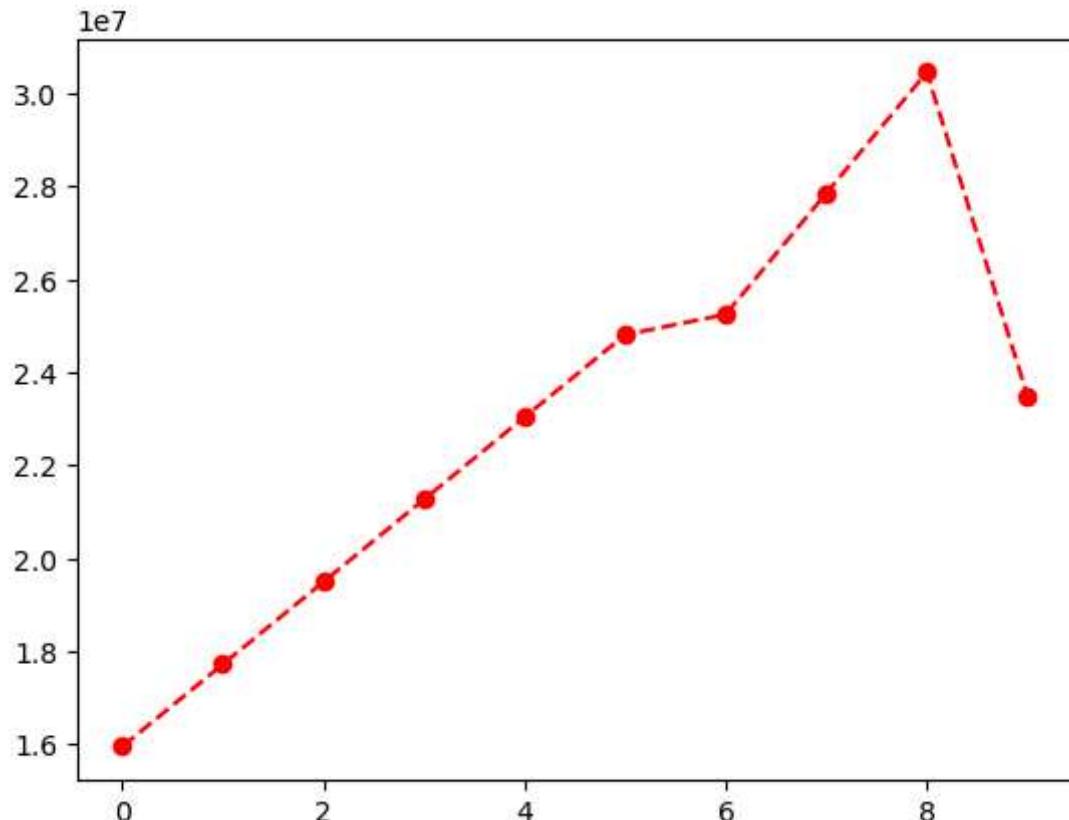
In [13]: `plt.plot(Salary[0],ls='--')
#plt.show()
#ls=line space
#'-','-.',':'`

Out[13]: `[<matplotlib.lines.Line2D at 0x2bc0eb83ed0>]`



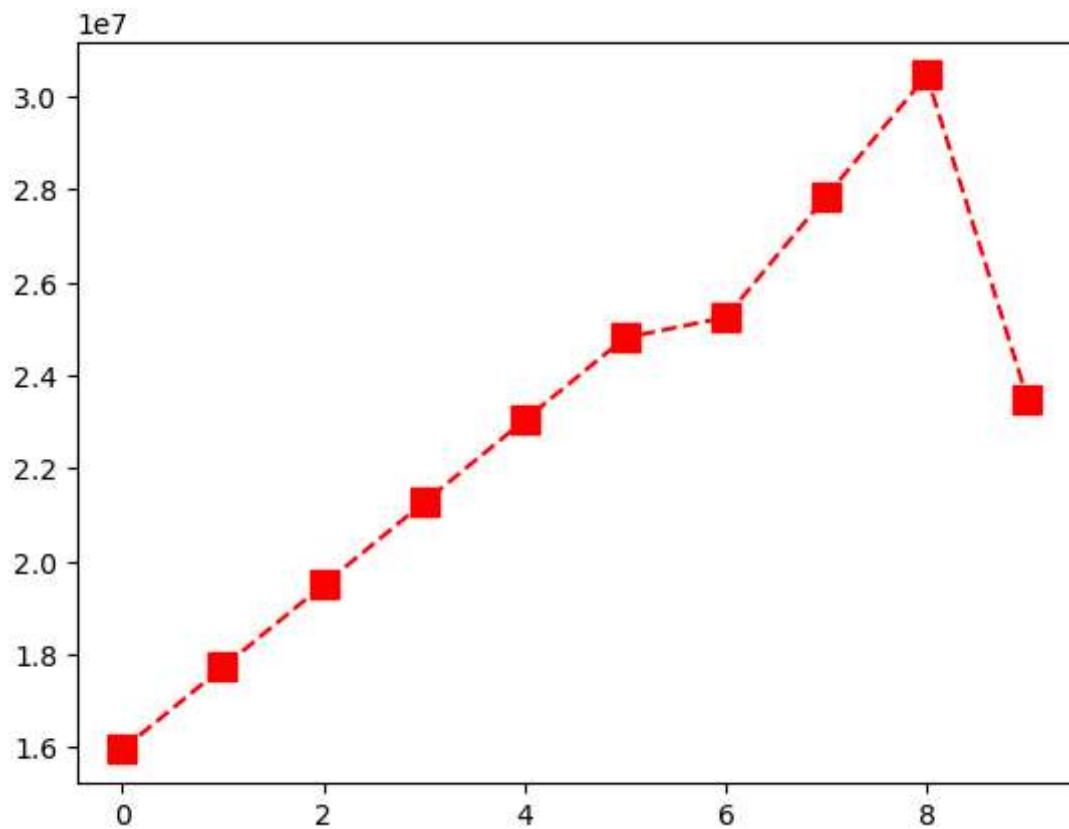
```
In [14]: plt.plot(Salary[0],ls='--',color='red',marker='o')
```

```
Out[14]: []
```



```
In [15]: plt.plot(Salary[0],ls='--',color='red',marker='s',ms='10')  
#ms=marker size ls=line style
```

```
Out[15]: []
```



```
In [16]: Sdict
```

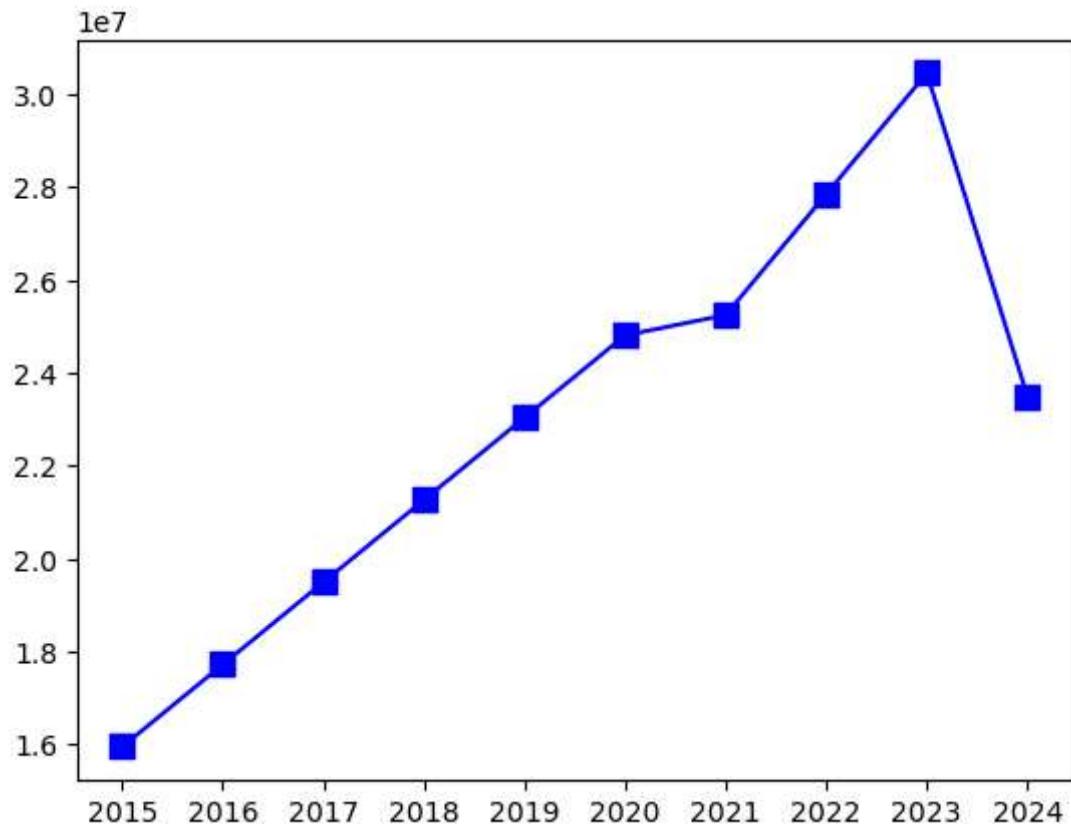
```
Out[16]: {'2015': 0,
           '2016': 1,
           '2017': 2,
           '2018': 3,
           '2019': 4,
           '2020': 5,
           '2021': 6,
           '2022': 7,
           '2023': 8,
           '2024': 9}
```

```
In [17]: Pdict
```

```
Out[17]: {'Sachin': 0,
           'Rahul': 1,
           'Smith': 2,
           'Sami': 3,
           'Pollard': 4,
           'Morris': 5,
           'Samson': 6,
           'Dhoni': 7,
           'Kohli': 8,
           'Sky': 9}
```

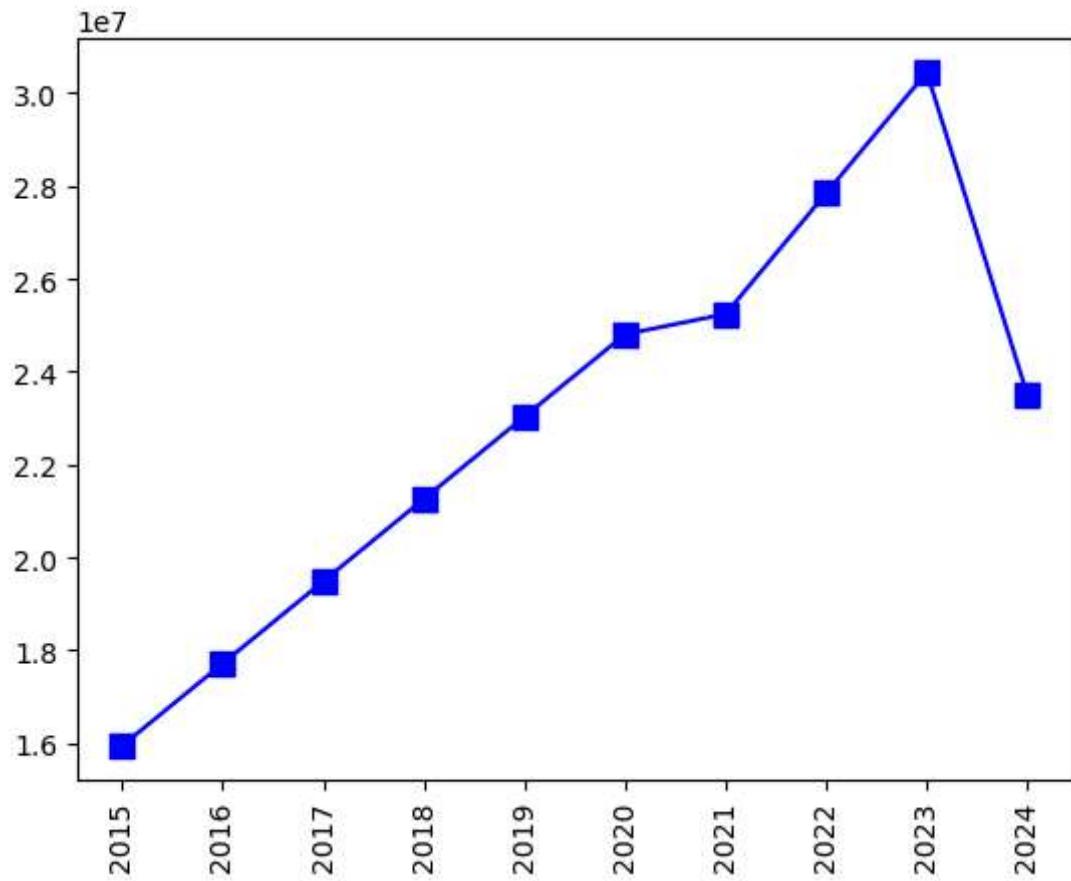
```
In [18]: plt.plot(Salary[0],c='blue',ls='-',marker='s',ms=8)
plt.xticks(list(range(0,10)),Seasons)
#xticks is x axis
```

```
Out[18]: ([<matplotlib.axis.XTick at 0x2bc104c8a50>,
<matplotlib.axis.XTick at 0x2bc104b9110>,
<matplotlib.axis.XTick at 0x2bc0ebce890>,
<matplotlib.axis.XTick at 0x2bc104efa90>,
<matplotlib.axis.XTick at 0x2bc104f9390>,
<matplotlib.axis.XTick at 0x2bc104fb2d0>,
<matplotlib.axis.XTick at 0x2bc10501510>,
<matplotlib.axis.XTick at 0x2bc10503650>,
<matplotlib.axis.XTick at 0x2bc10505910>,
<matplotlib.axis.XTick at 0x2bc10500110>],
[Text(0, 0, '2015'),
Text(1, 0, '2016'),
Text(2, 0, '2017'),
Text(3, 0, '2018'),
Text(4, 0, '2019'),
Text(5, 0, '2020'),
Text(6, 0, '2021'),
Text(7, 0, '2022'),
Text(8, 0, '2023'),
Text(9, 0, '2024')])
```



```
In [19]: plt.plot(Salary[0],c='blue',ls='-',marker='s',ms=8,label=Players[0])
plt.xticks(list(range(0,10)),Seasons,rotation='vertical')
```

```
Out[19]: ([<matplotlib.axis.XTick at 0x2bc10554850>,
<matplotlib.axis.XTick at 0x2bc10546ad0>,
<matplotlib.axis.XTick at 0x2bc10554250>,
<matplotlib.axis.XTick at 0x2bc10573d50>,
<matplotlib.axis.XTick at 0x2bc1057e050>,
<matplotlib.axis.XTick at 0x2bc10580150>,
<matplotlib.axis.XTick at 0x2bc105810d0>,
<matplotlib.axis.XTick at 0x2bc105830d0>,
<matplotlib.axis.XTick at 0x2bc10589210>,
<matplotlib.axis.XTick at 0x2bc1058b390>],
[Text(0, 0, '2015'),
Text(1, 0, '2016'),
Text(2, 0, '2017'),
Text(3, 0, '2018'),
Text(4, 0, '2019'),
Text(5, 0, '2020'),
Text(6, 0, '2021'),
Text(7, 0, '2022'),
Text(8, 0, '2023'),
Text(9, 0, '2024')])
```

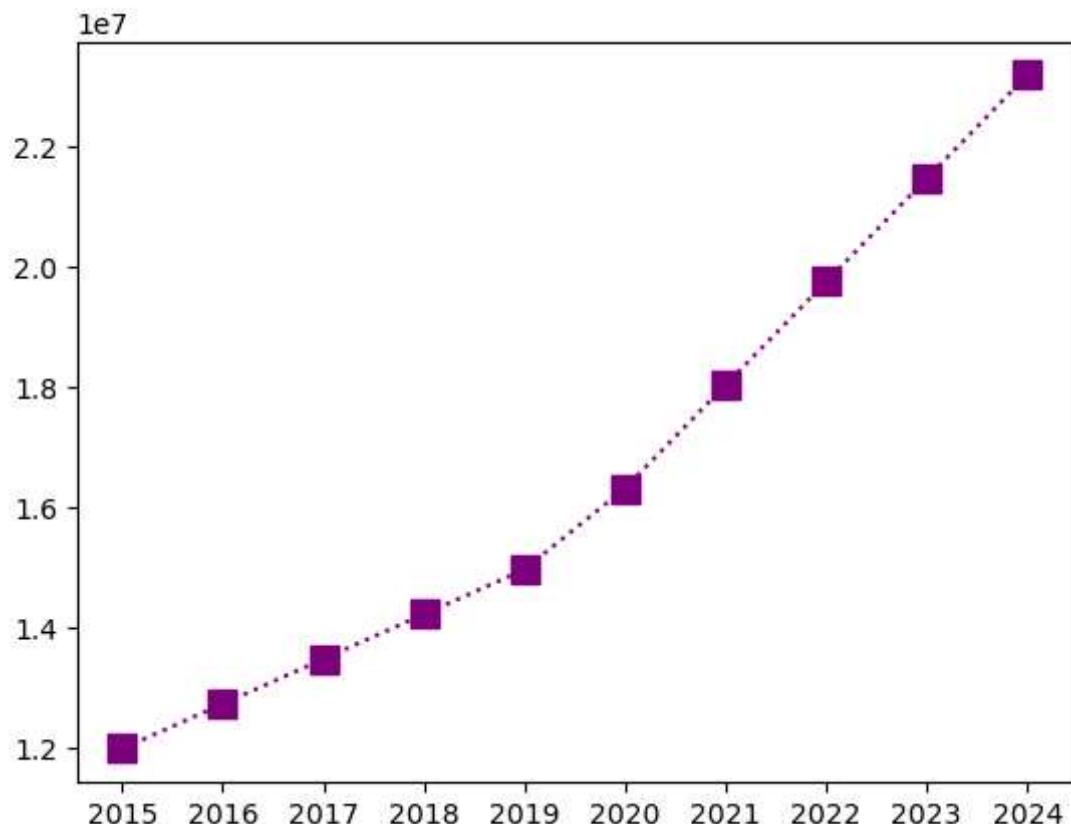


```
In [20]: Salary[1]
```

```
Out[20]: array([12000000, 12744189, 13488377, 14232567, 14976754, 16324500,
18038573, 19752645, 21466718, 23180790])
```

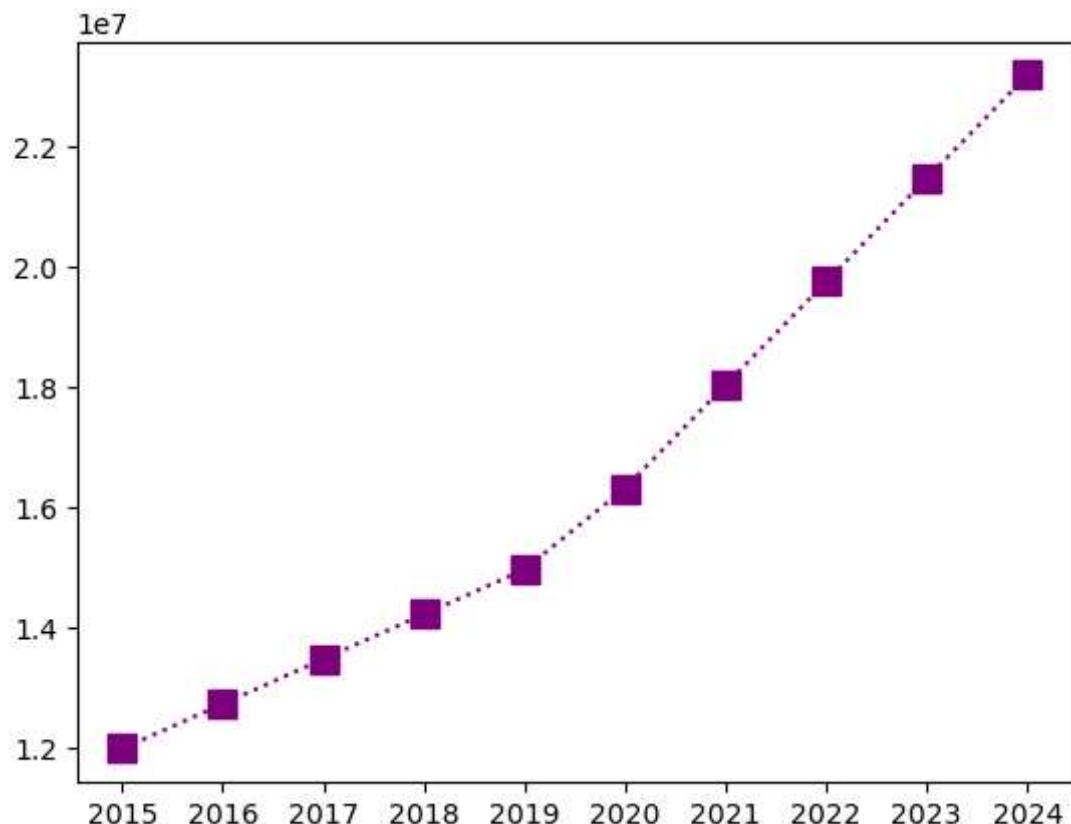
```
In [21]: plt.plot(Salary[1],c='purple',ls=':',marker='s',ms=10,)
plt.xticks(list(range(0,10)),Seasons)
```

```
Out[21]: ([<matplotlib.axis.XTick at 0x2bc105bfed0>,
<matplotlib.axis.XTick at 0x2bc105a9110>,
<matplotlib.axis.XTick at 0x2bc104b8090>,
<matplotlib.axis.XTick at 0x2bc105f9a10>,
<matplotlib.axis.XTick at 0x2bc105fba10>,
<matplotlib.axis.XTick at 0x2bc105fdc10>,
<matplotlib.axis.XTick at 0x2bc105ffd10>,
<matplotlib.axis.XTick at 0x2bc105ebe90>,
<matplotlib.axis.XTick at 0x2bc1060e150>,
<matplotlib.axis.XTick at 0x2bc10614b90>],
[Text(0, 0, '2015'),
Text(1, 0, '2016'),
Text(2, 0, '2017'),
Text(3, 0, '2018'),
Text(4, 0, '2019'),
Text(5, 0, '2020'),
Text(6, 0, '2021'),
Text(7, 0, '2022'),
Text(8, 0, '2023'),
Text(9, 0, '2024')])
```



```
In [22]: plt.plot(Salary[1],c='purple',ls=':',marker='s',ms=10,label=Players[1])
plt.xticks(list(range(0,10)),Seasons)
```

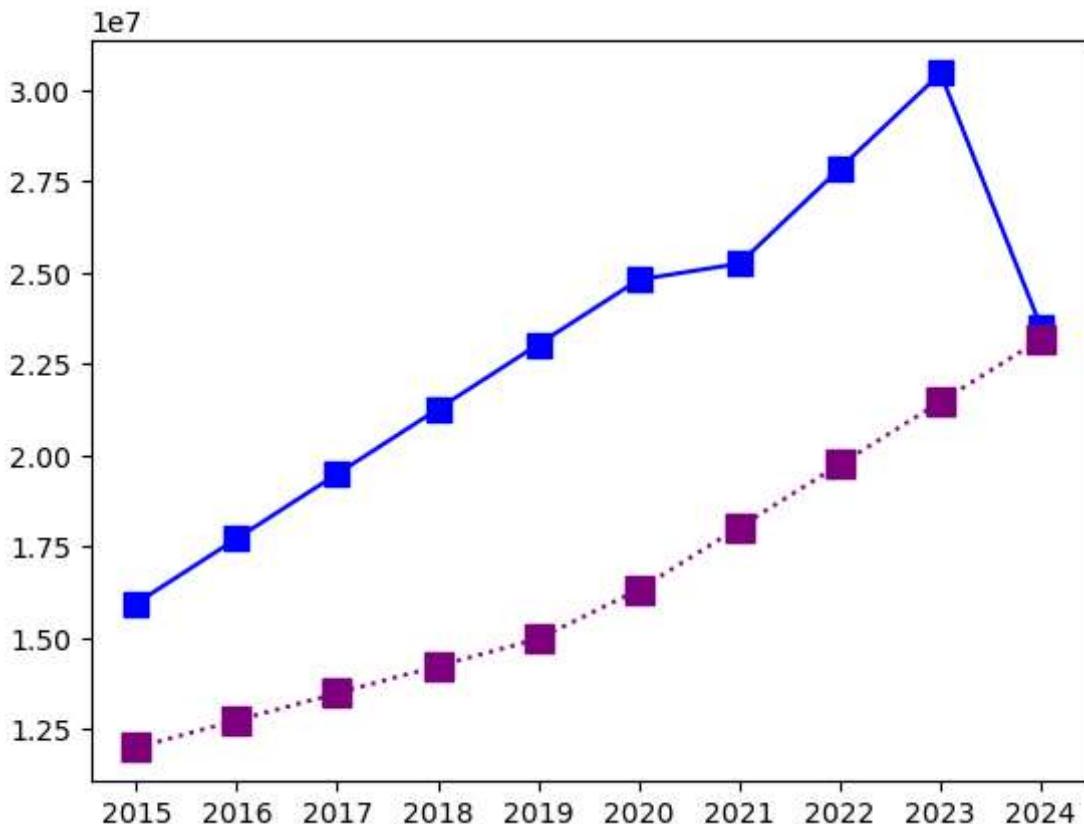
```
Out[22]: ([<matplotlib.axis.XTick at 0x2bc10639a90>,
<matplotlib.axis.XTick at 0x2bc10619110>,
<matplotlib.axis.XTick at 0x2bc104ca150>,
<matplotlib.axis.XTick at 0x2bc0eca7a10>,
<matplotlib.axis.XTick at 0x2bc0ecb19d0>,
<matplotlib.axis.XTick at 0x2bc0eca5c90>,
<matplotlib.axis.XTick at 0x2bc0ecbce90>,
<matplotlib.axis.XTick at 0x2bc0ecbf210>,
<matplotlib.axis.XTick at 0x2bc0ecc5210>,
<matplotlib.axis.XTick at 0x2bc0ecc7310>],
[Text(0, 0, '2015'),
Text(1, 0, '2016'),
Text(2, 0, '2017'),
Text(3, 0, '2018'),
Text(4, 0, '2019'),
Text(5, 0, '2020'),
Text(6, 0, '2021'),
Text(7, 0, '2022'),
Text(8, 0, '2023'),
Text(9, 0, '2024')])
```



```
In [23]: plt.plot(Salary[0],c='blue',ls='-',marker='s',ms=8,label=Players[0])

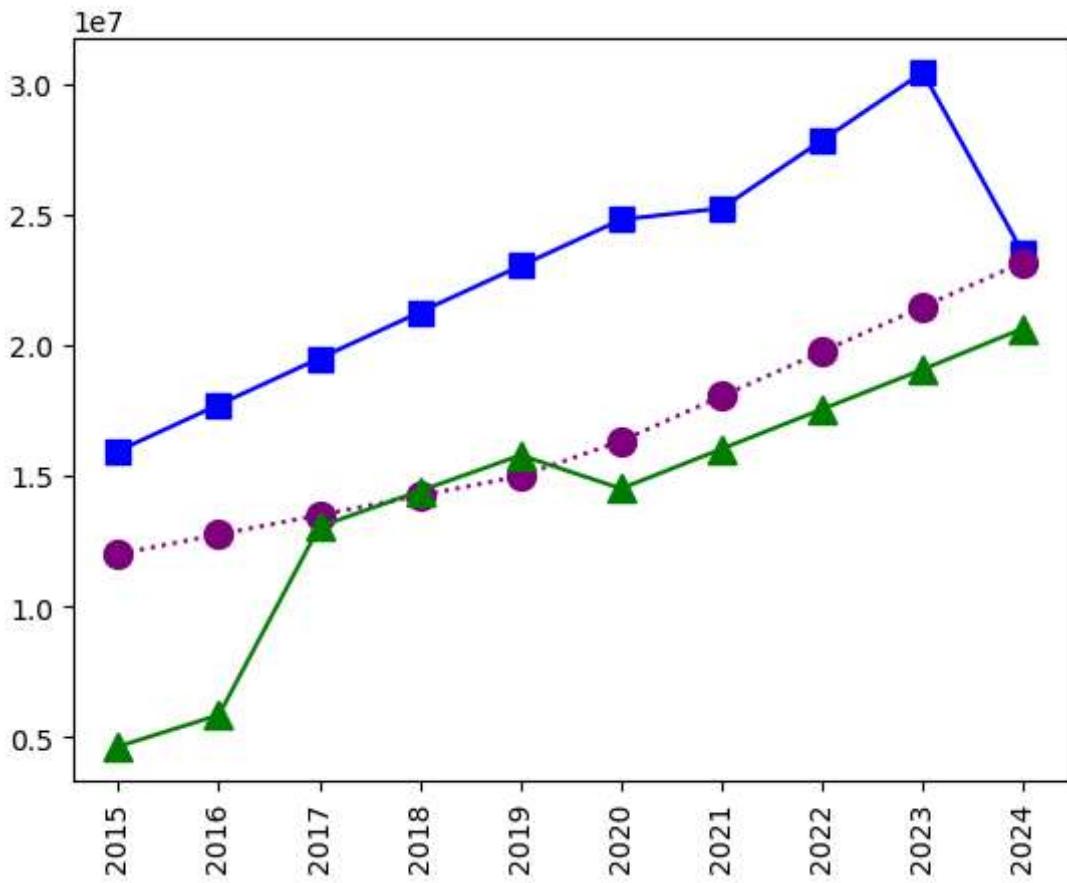
plt.plot(Salary[1],c='purple',ls=':',marker='s',ms=10,label=Players[1])
plt.xticks(list(range(0,10)),Seasons)
plt.show
```

```
Out[23]: <function matplotlib.pyplot.show(close=None, block=None)>
```



```
In [24]: plt.plot(Salary[0],c='blue',ls='-',marker='s',ms=8,label=Players[0])  
  
plt.plot(Salary[1],c='purple',ls=':',marker='o',ms=10,label=Players[1])  
plt.plot(Salary[2],c='green',ls='-',marker='^',ms=10,label=Players[2])  
plt.xticks(list(range(0,10)),Seasons,rotation='vertical')  
plt.show
```

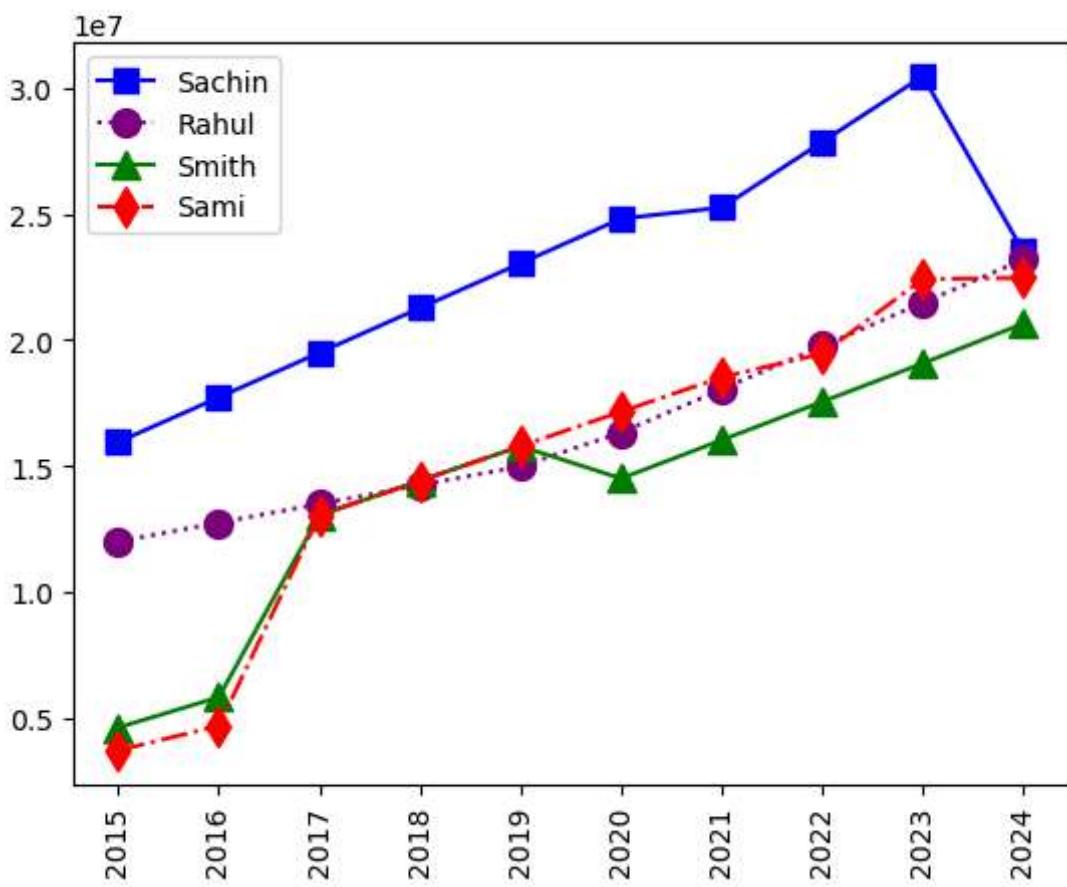
```
Out[24]: <function matplotlib.pyplot.show(close=None, block=None)>
```



```
In [25]: plt.plot(Salary[0],c='blue',ls='-',marker='s',ms=8,label=Players[0])

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

```
Out[25]: ([<matplotlib.axis.XTick at 0x2bc0ed43690>,
 <matplotlib.axis.XTick at 0x2bc106aa190>,
 <matplotlib.axis.XTick at 0x2bc106cef50>,
 <matplotlib.axis.XTick at 0x2bc10676e10>,
 <matplotlib.axis.XTick at 0x2bc1069e6d0>,
 <matplotlib.axis.XTick at 0x2bc106813d0>,
 <matplotlib.axis.XTick at 0x2bc10683010>,
 <matplotlib.axis.XTick at 0x2bc106890d0>,
 <matplotlib.axis.XTick at 0x2bc1052c6d0>,
 <matplotlib.axis.XTick at 0x2bc1067a950>],
 [Text(0, 0, '2015'),
 Text(1, 0, '2016'),
 Text(2, 0, '2017'),
 Text(3, 0, '2018'),
 Text(4, 0, '2019'),
 Text(5, 0, '2020'),
 Text(6, 0, '2021'),
 Text(7, 0, '2022'),
 Text(8, 0, '2023'),
 Text(9, 0, '2024')])
```



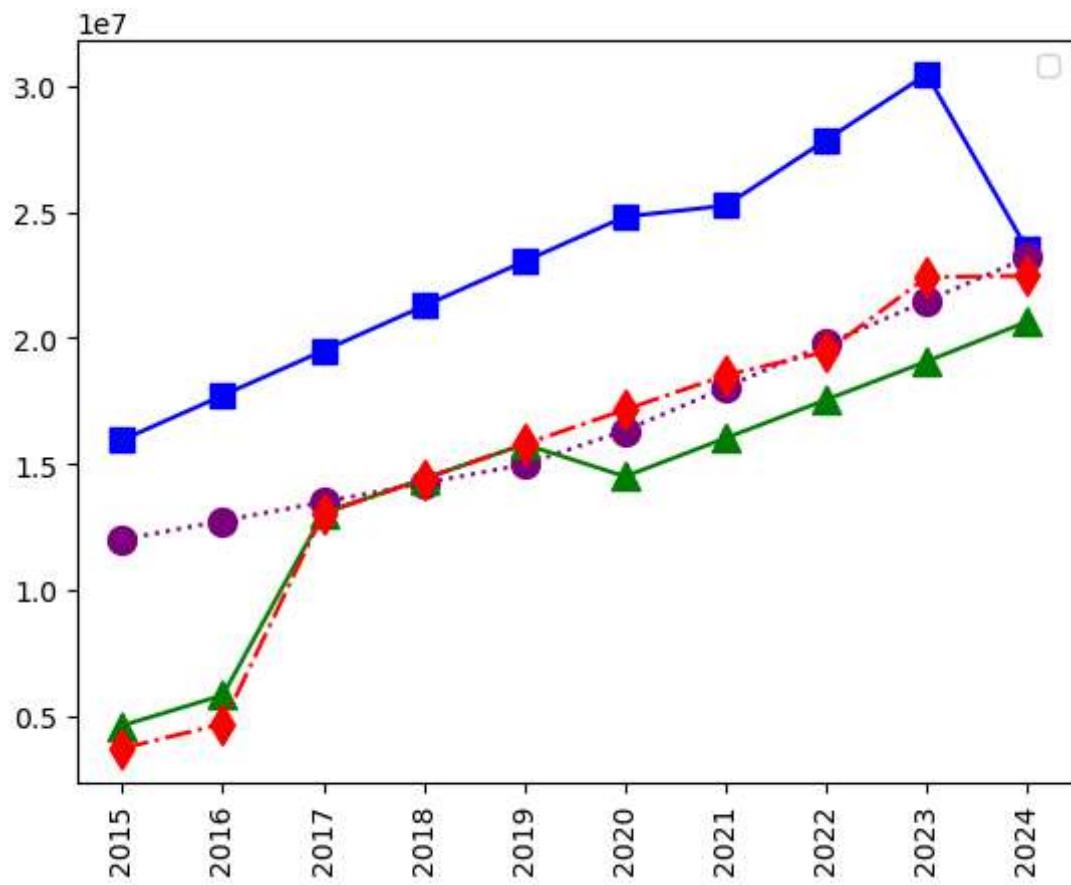
```
In [26]: plt.plot(Salary[0],c='blue',ls='-',marker='s',ms=8)
```

```
plt.plot(Salary[1],c='purple',ls=':',marker='o',ms=10)
plt.plot(Salary[2],c='green',ls='-',marker='^',ms=10)
plt.plot(Salary[3],c='red',ls='-.',marker='d',ms=10)
plt.legend()
plt.xticks(list(range(0,10)),Seasons,rotation='vertical')
```

No artists with labels found to put in legend. Note that artists whose label start with an underscore are ignored when legend() is called with no argument.

```
Out[26]: [

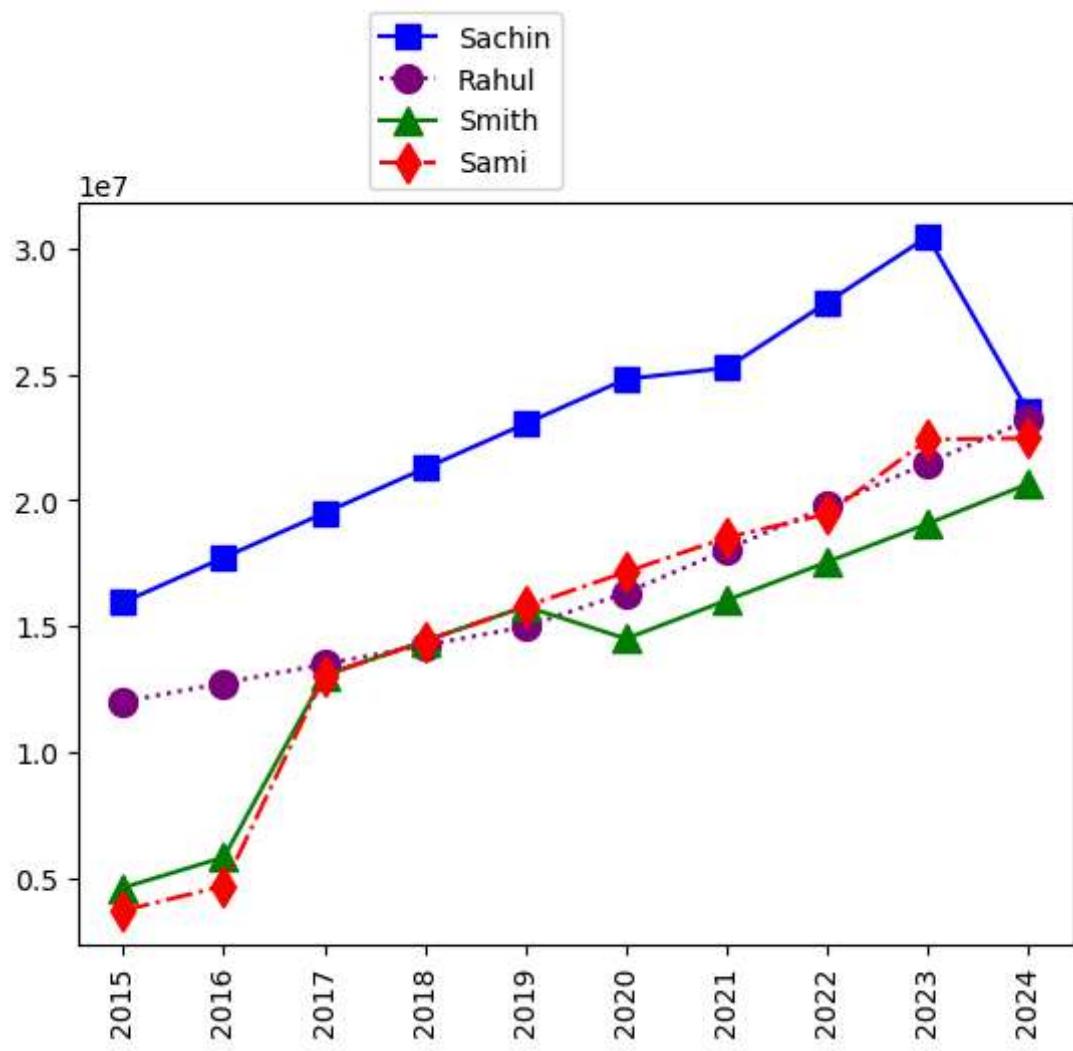
```



```
In [27]: plt.plot(Salary[0],c='blue',ls='-',marker='s',ms=8,label=Players[0])

plt.plot(Salary[1],c='purple',ls=':',marker='o',ms=10,label=Players[1])
plt.plot(Salary[2],c='green',ls='-',marker='^',ms=10,label=Players[2])
plt.plot(Salary[3],c='red',ls='-.',marker='d',ms=10,label=Players[3])
plt.legend(loc='lower right',bbox_to_anchor=(0.5,1))
plt.xticks(list(range(0,10)),Seasons,rotation='vertical')
```

```
Out[27]: ([<matplotlib.axis.XTick at 0x2bc108a6dd0>,
 <matplotlib.axis.XTick at 0x2bc108a6210>,
 <matplotlib.axis.XTick at 0x2bc10896cd0>,
 <matplotlib.axis.XTick at 0x2bc0ed3b6d0>,
 <matplotlib.axis.XTick at 0x2bc0ed40d10>,
 <matplotlib.axis.XTick at 0x2bc1060f810>,
 <matplotlib.axis.XTick at 0x2bc0ed5d590>,
 <matplotlib.axis.XTick at 0x2bc0ed6b550>,
 <matplotlib.axis.XTick at 0x2bc0ed59c90>,
 <matplotlib.axis.XTick at 0x2bc0ed19d90>],
 [Text(0, 0, '2015'),
 Text(1, 0, '2016'),
 Text(2, 0, '2017'),
 Text(3, 0, '2018'),
 Text(4, 0, '2019'),
 Text(5, 0, '2020'),
 Text(6, 0, '2021'),
 Text(7, 0, '2022'),
 Text(8, 0, '2023'),
 Text(9, 0, '2024')])
```



```
In [28]: #+ve relation,-ve relation
```

```
In [ ]:
```

```
In [ ]:
```

```
In [ ]:
```