

knowing the insights from history data(ipl) using "numpy","matplotlib"

```
In [2]: #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,"2023":8,"2024":9}

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

#Salaries
Sachin_Salary = [15946875, 17718750, 19490625, 21262500, 23034375, 24806250, 25244493, 27850000]
Rahul_Salary = [12000000, 12744189, 13488377, 14232567, 14976754, 16324500, 18038573, 19750000]
Smith_Salary = [4621800, 5828090, 13041250, 14410581, 15779912, 14500000, 16022500, 17545000]
Sami_Salary = [3713640, 4694041, 13041250, 14410581, 15779912, 17149243, 18518574, 19450000]
Pollard_Salary = [4493160, 4806720, 6061274, 13758000, 15202590, 16647180, 18091770, 19536000]
Morris_Salary = [3348000, 4235220, 12455000, 14410581, 15779912, 14500000, 16022500, 17545000]
Samson_Salary = [3144240, 3380160, 3615960, 4574189, 13520500, 14940153, 16359805, 1777945000]
Dhoni_Salary = [0, 0, 4171200, 4484040, 4796880, 6053663, 15506632, 16669630, 17832627, 18990000]
Kohli_Salary = [0, 0, 4822800, 5184480, 5546160, 6993708, 16402500, 17632688, 1886287500]
Sky_Salary = [3031920, 3841443, 13041250, 14410581, 15779912, 14200000, 15691000, 171820000]
#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_
```

In [3]: Games #games arrays will be printed

```
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 # points array will be printed

```
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 [5]: Games[0] # 0 index row means as per the data Sachin games will be printed

```
Out[5]: array([80, 77, 82, 82, 73, 82, 58, 78, 6, 35])
```

In [6]: Games[0:5] #slicing from "0" to "4th" games rows will be printed

```
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]])
```

In [7]: Games[2,8] # in games array 2nd "row" and 8th "column" number is printed.

```
Out[7]: 77
```

In [8]: Pdict #pointdict

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

```
In [9]: Pdict["Sachin"] #index of the sachin
```

```
Out[9]: 0
```

```
In [10]: Salary #salary of all players index wise
```

```
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]: Salary[Pdict['Sky']][Sdict['2019']]
```

```
Out[11]: 15779912
```

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

```
C:\Users\HP\AppData\Local\Temp\ipykernel_12236\3709746658.py:1: RuntimeWarning: divide by zero encountered in divide
      Salary/Games
```

```
Out[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]])
```

```
In [13]: np.round(Salary/Games)
```

```
C:\Users\HP\AppData\Local\Temp\ipykernel_12236\3232172828.py:1: RuntimeWarning: divide by zero encountered in divide
np.round(Salary/Games)
```

```
Out[13]: 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 [14]: import numpy as np
import matplotlib.pyplot as plt
```

```
In [15]: %matplotlib inline
```

```
In [16]: Salary
```

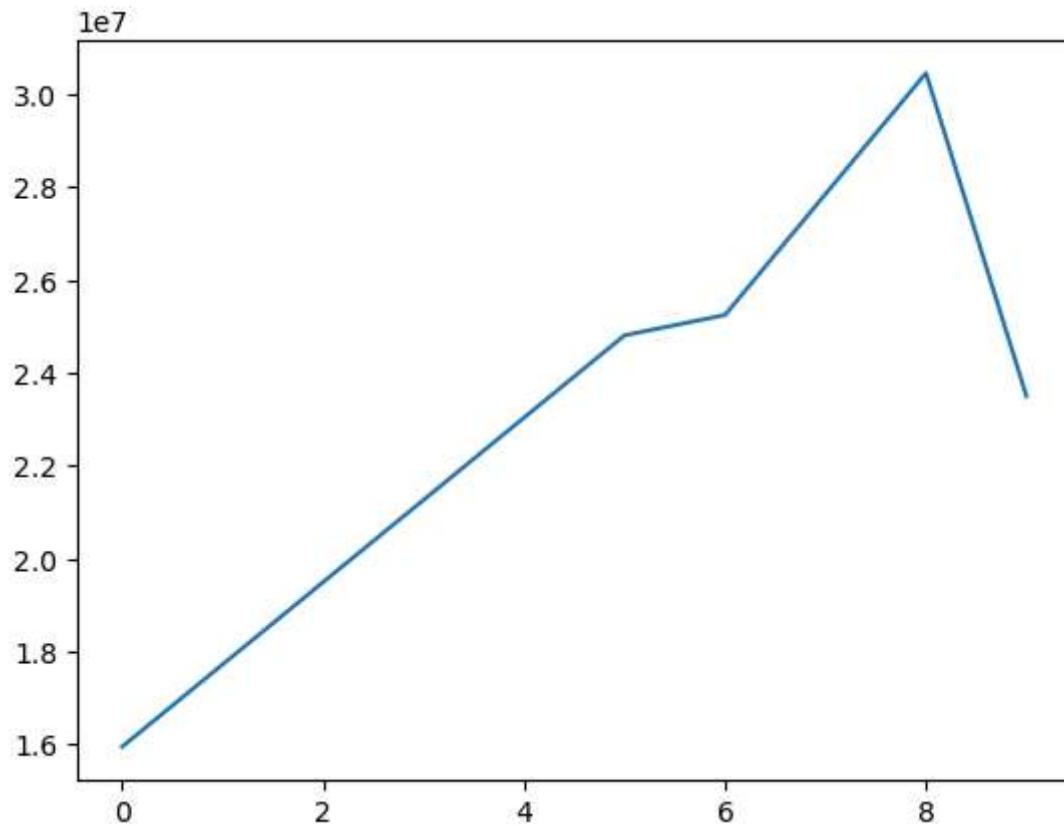
```
Out[16]: array([[15946875, 17718750, 19490625, 21262500, 23034375, 24806250,
  25244493, 27849149, 30453805, 23500000],
 [12000000, 12744189, 13488377, 14232567, 14976754, 16324500,
  18038573, 19752645, 21466718, 23180790],
 [ 4621800,  5828090, 13041250, 14410581, 15779912, 14500000,
 16022500, 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 [17]: Salary[0] #sachin salary
```

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

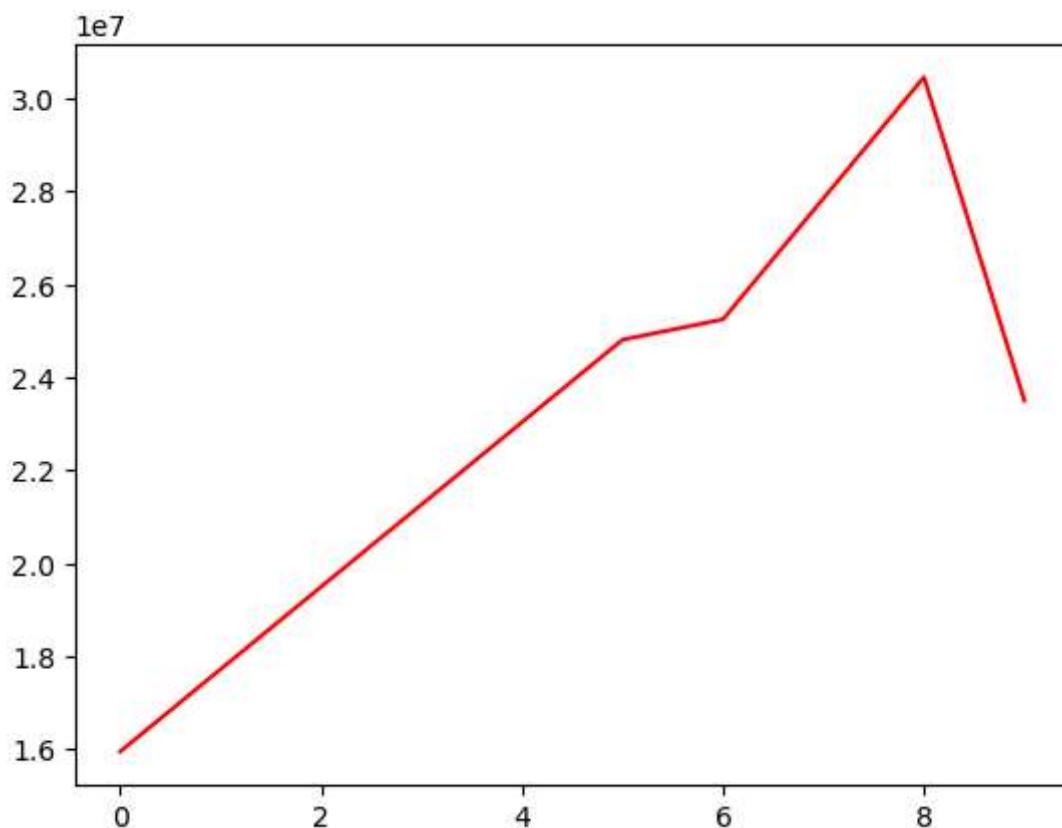
```
In [18]: plt.plot(Salary[0])
```

```
Out[18]: [<matplotlib.lines.Line2D at 0x123843a4e30>]
```



```
In [19]: plt.plot(Salary[0], c='red') # "c" refers to colour we can change it
```

```
Out[19]: [<matplotlib.lines.Line2D at 0x123843f89b0>]
```

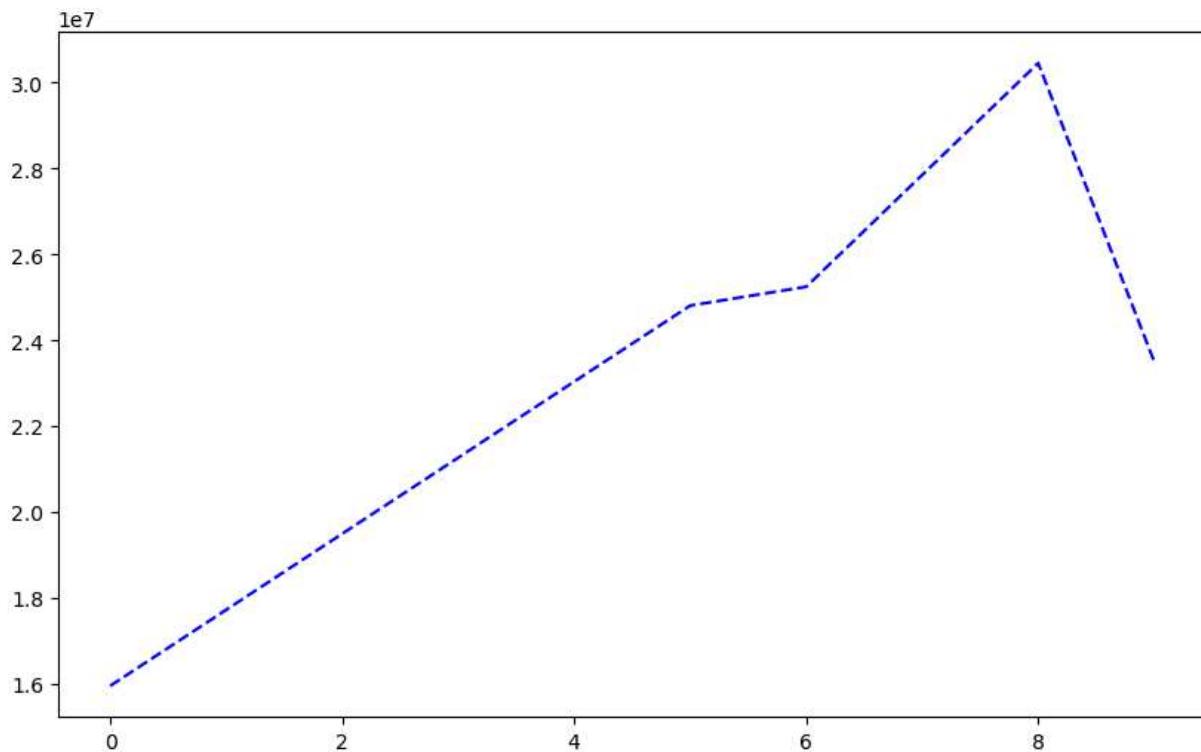


- c refers to "colour"
- we can plot our graph with different colour as per our requirement

```
In [21]: %matplotlib inline  
plt.rcParams['figure.figsize']=10,6 # to reduce the size
```

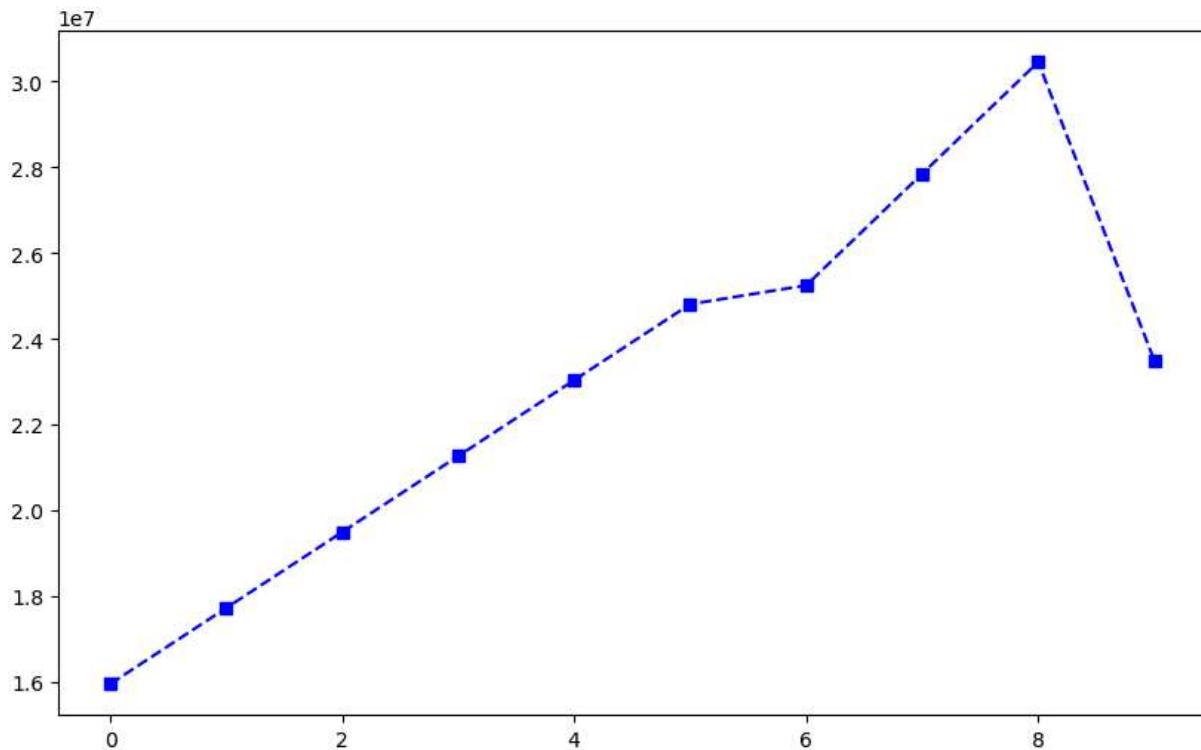
```
In [22]: plt.plot(Salary[0],c="blue",ls="dashed") # "c" refers to "colour" and "ls" refers
```

```
Out[22]: [<matplotlib.lines.Line2D at 0x12384cd31d0>]
```



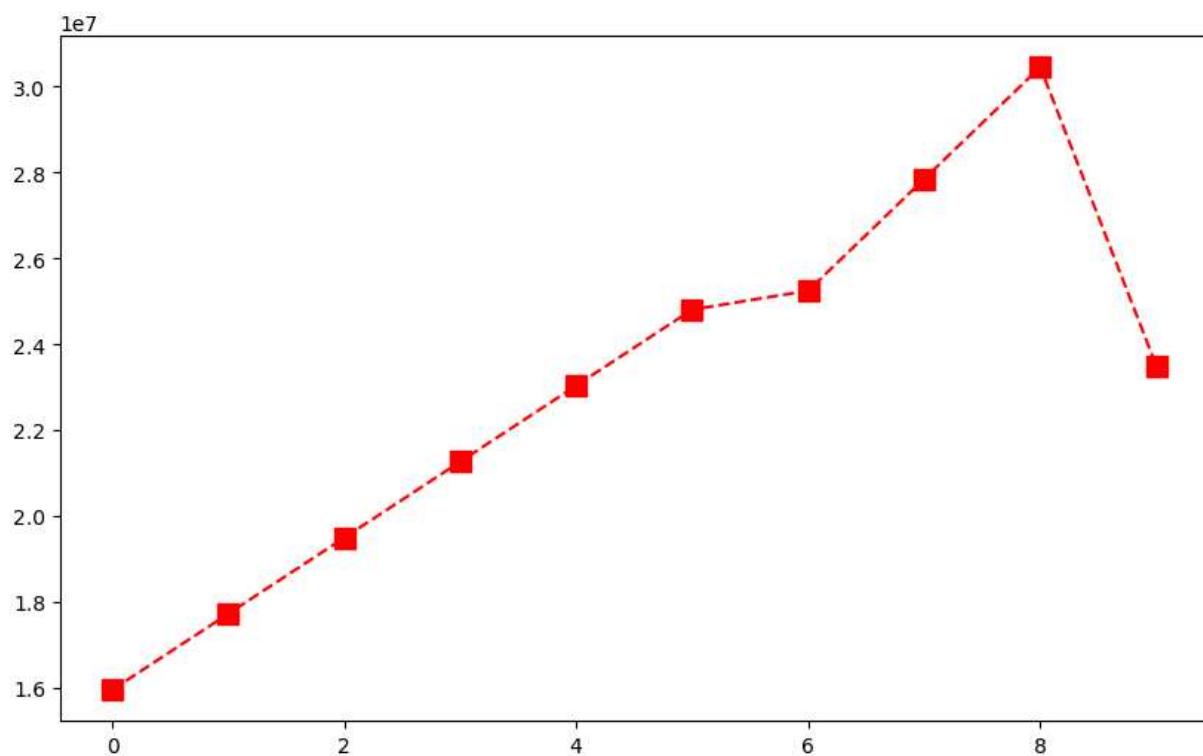
```
In [23]: plt.plot(Salary[0],c="blue",ls="--",marker="s") # "Ls" means Line style and "s" me
```

```
Out[23]: [<matplotlib.lines.Line2D at 0x12384caaee10>]
```



```
In [24]: plt.plot(Salary[0],c='red',ls='--',marker='s',ms=10) # "ms" refers to marker size
```

```
Out[24]: [<matplotlib.lines.Line2D at 0x123844d6390>]
```



In [25]: Sdict

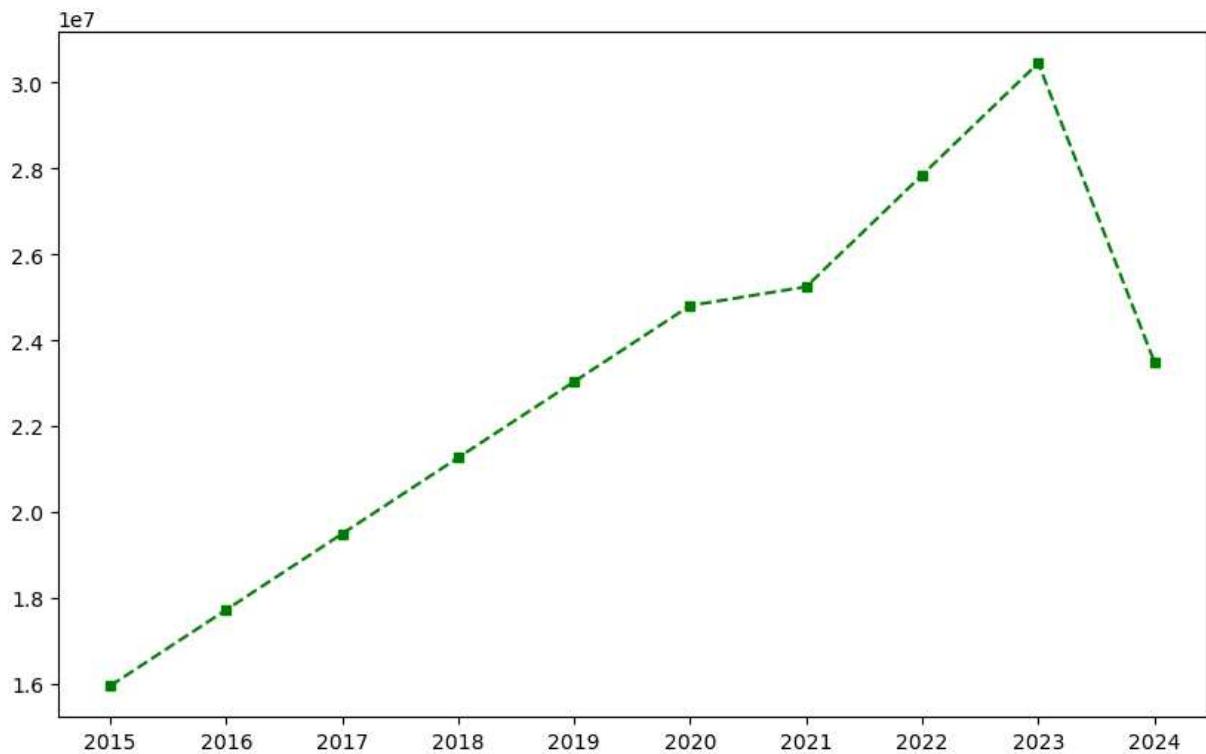
```
Out[25]: {'2015': 0,
 '2016': 1,
 '2017': 2,
 '2018': 3,
 '2019': 4,
 '2020': 5,
 '2021': 6,
 '2022': 7,
 '2023': 8,
 '2024': 9}
```

In [26]: Pdict

```
Out[26]: {'Sachin': 0,
 'Rahul': 1,
 'Smith': 2,
 'Sami': 3,
 'Pollard': 4,
 'Morris': 5,
 'Samson': 6,
 'Dhoni': 7,
 'Kohli': 8,
 'Sky': 9}
```

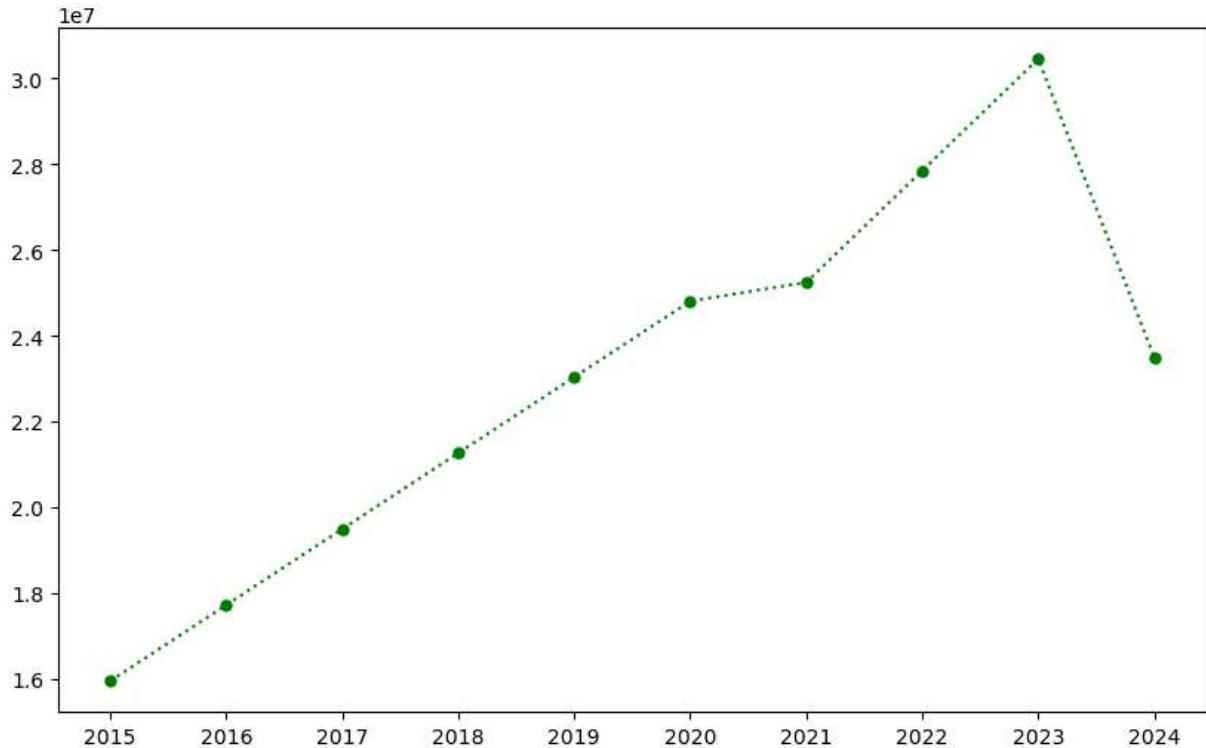
In [27]: # to know the insights more clearly we can plot the required attribute on "x-axis"
#we can define the x-axis as "xtick" and y-axis as "ytick".

```
In [28]: plt.plot(Salary[0],c="green",ls='--',marker='s',ms=5)
plt.xticks(list(range(0,10)),Seasons)
plt.show()
```

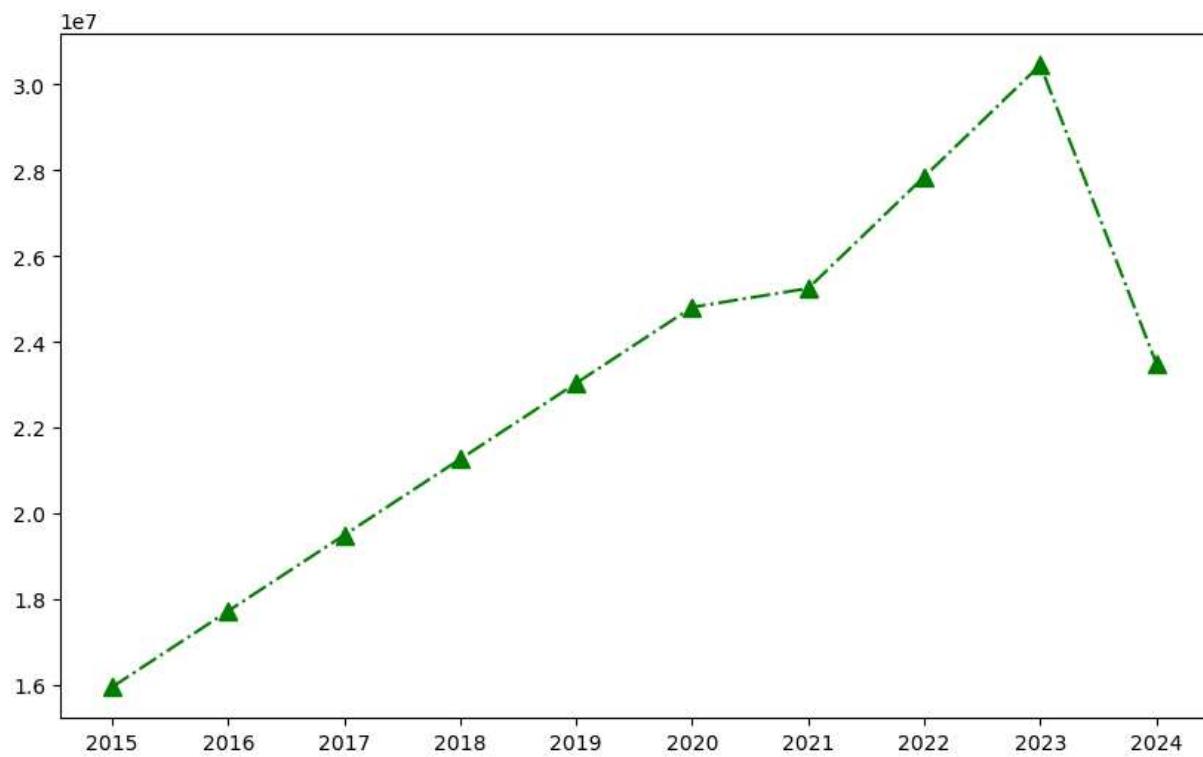


- the insight we can find through the above plotted graph is .sachine salary was increased till 2023.
- then in 2024 it was droped

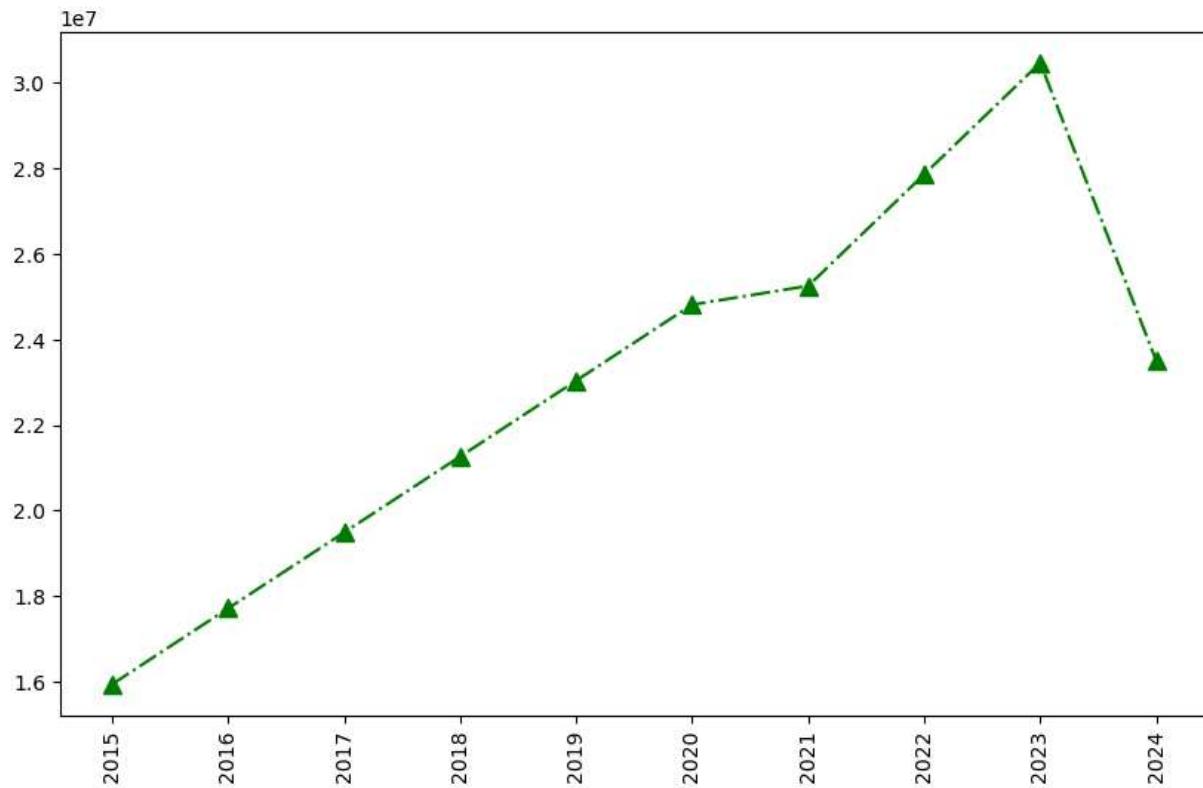
```
In [30]: plt.plot(Salary[0],c="green",ls=':',marker='o',ms=5)  
plt.xticks(list(range(0,10)),Seasons)  
plt.show()
```



```
In [31]: plt.plot(Salary[0],c="green",ls='-.',marker='^',ms=8)  
plt.xticks(list(range(0,10)),Seasons)  
plt.show()
```

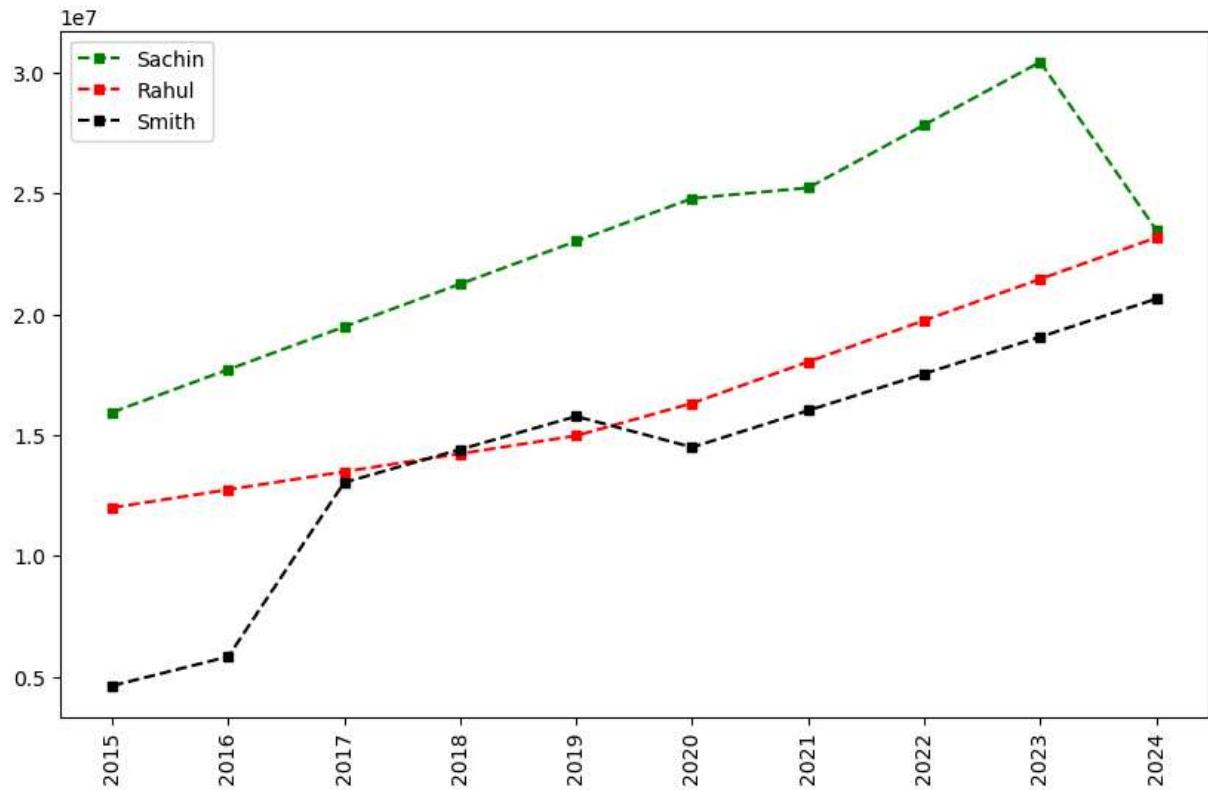


```
In [32]: plt.plot(Salary[0],c="green",ls='-.',marker='^',ms=8)  
plt.xticks(list(range(0,10)),Seasons,rotation='vertical')  
plt.show()
```



- legend() fun is used to represent the labels

```
In [53]: plt.plot(Salary[0],c='green',ls='--',marker='s',ms='5',label="Sachin")
plt.plot(Salary[1],c='red',ls='--',marker='s',ms='5',label="Rahul")
plt.plot(Salary[2],c='black',ls='--',marker='s',ms='5',label="Smith")
plt.xticks(list(range(0,10)),Seasons,rotation='vertical')
plt.legend()
plt.show()
```



```
In [ ]:
```

In []:

In []:

In []: