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

#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, Samsc

#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, Morr
```

In [8]:
```
Salary
```

Out[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]])
```

In [22]:
```
Points
```

Out[22]:
```
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 [24]:
```
mydata=np.arange(0,20)
print(mydata)
```

```
[ 0  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19]
```

In [26]:
```
np.reshape(mydata,(4,5))
```

Out[26]:
```
array([[ 0,  1,  2,  3,  4],
       [ 5,  6,  7,  8,  9],
       [10, 11, 12, 13, 14],
       [15, 16, 17, 18, 19]])
```

In [28]:
```
mydata
```

Out[28]:
```
array([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13, 14, 15, 16,
       17, 18, 19])
```

In [30]:
```
MATR1=np.reshape(mydata,(5,4),order='c')
MATR1
```

Out[30]:
```
array([[ 0,  1,  2,  3],
       [ 4,  5,  6,  7],
       [ 8,  9, 10, 11],
       [12, 13, 14, 15],
       [16, 17, 18, 19]])
```

In [32]:
```
MATR1[4,3]
```

Out[32]:
```
19
```

In [34]:
```
MATR1[3,3]
```

Out[34]:
```
15
```

In [40]:
```
MATR1[-3,-1]
```

Out[40]:
```
11
```

In [44]:
```
MATR1
```

Out[44]:
```
array([[ 0,  1,  2,  3],
       [ 4,  5,  6,  7],
       [ 8,  9, 10, 11],
       [12, 13, 14, 15],
       [16, 17, 18, 19]])
```

In [46]:
```
mydata
```

Out[46]:
```
array([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13, 14, 15, 16,
       17, 18, 19])
```

In [48]:
```
MATR2=np.reshape(mydata,(5,4),order='F')
MATR2
```

Out[48]:
```
array([[ 0,  5, 10, 15],
       [ 1,  6, 11, 16],
       [ 2,  7, 12, 17],
       [ 3,  8, 13, 18],
       [ 4,  9, 14, 19]])
```

In [52]:
```
MATR2[4,3]
```

Out[52]:
```
19
```

In [54]:
```
MATR2[0,2]
```

Out[54]:
```
10
```

In [56]:
```
MATR2[0:2]
```

Out[56]:
```
array([[ 0,  5, 10, 15],
       [ 1,  6, 11, 16]])
```

In [58]:
```
MATR2
```

Out[58]:
```
array([[ 0,  5, 10, 15],
       [ 1,  6, 11, 16],
       [ 2,  7, 12, 17],
       [ 3,  8, 13, 18],
       [ 4,  9, 14, 19]])
```

In [62]:
```
MATR2[1,2]
```

Out[62]:
```
11
```

In [64]:
```
MATR2[-2,-1]
```

Out[64]:
```
18
```

In [66]:
```
MATR2[-3,-3]
```

Out[66]:
```
7
```

In [68]:
```
MATR2[0:2]
```

Out[68]:
```
array([[ 0,  5, 10, 15],
       [ 1,  6, 11, 16]])
```

In [70]:
```
mydata
```

Out[70]:
```
array([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13, 14, 15, 16,
       17, 18, 19])
```

In [72]:
```
MATR3=np.reshape(mydata,(5,4),order='A')
MATR3
```

Out[72]:
```
array([[ 0,  1,  2,  3],
       [ 4,  5,  6,  7],
       [ 8,  9, 10, 11],
       [12, 13, 14, 15],
       [16, 17, 18, 19]])
```

In [74]:
```
MATR2
```

Out[74]:
```
array([[ 0,  5, 10, 15],
       [ 1,  6, 11, 16],
       [ 2,  7, 12, 17],
       [ 3,  8, 13, 18],
       [ 4,  9, 14, 19]])
```

In [76]:
```
MATR1
```

Out[76]:
```
array([[ 0,  1,  2,  3],
       [ 4,  5,  6,  7],
       [ 8,  9, 10, 11],
       [12, 13, 14, 15],
       [16, 17, 18, 19]])
```

In [80]:
```
a1=['welcome','to','datascience']
a2=['required','hard','work']
a3=[1,2,3]
```

In [82]:
```
[a1,a2,a3]
```

Out[82]:
```
[['welcome', 'to', 'datascience'], ['required', 'hard', 'work'], [1, 2, 3]]
```

In [84]:
```
np.array([a1,a2,a3])
```

Out[84]:
```
array([['welcome', 'to', 'datascience'],
       ['required', 'hard', 'work'],
       ['1', '2', '3']], dtype='<U11')
```

In [86]:
```
Games
```

Out[86]:
```
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 [90]:
```
Games[0]
```

Out[90]:
```
array([80, 77, 82, 82, 73, 82, 58, 78,  6, 35])
```

In [92]:
```
Games[5]
```

Out[92]:
```
array([70, 69, 67, 77, 70, 77, 57, 74, 79, 44])
```

In [88]:
```
Games[0:5]
```

Out[88]:
```
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 [94]:
```
Games[0,5]
```

Out[94]:
```
82
```

In [96]:
```
Games[0,2]
```

Out[96]:
```
82
```

In [98]:
```
Games
```

Out[98]:
```
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 [100…
```
Games[0:2]
```

Out[100…
```
array([[80, 77, 82, 82, 73, 82, 58, 78,  6, 35],
       [82, 57, 82, 79, 76, 72, 60, 72, 79, 80]])
```

In [12]:
```
Points[0:5]
```

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]])
```

In [14]:
```
Games[0,5]
```

Out[14]:
```
82
```

In [16]:
```
Games[1,2]
```

Out[16]:
```
82
```

In [18]:
```
Games[-3,-1]
```

Out[18]:
```
27
```

In [20]:
```
Games[-3,1]
```

Out[20]:
```
35
```

In [102…
```
Points
```

Out[102…
```
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 [104…
```
Points[6,1]
```

Out[104…
```
1104
```

In [106…
```
Points[6,1]
```

Out[106…
```
1104
```

In [108…
```
Points[3:6]
```

Out[108…
```
array([[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]])
```

In [110…
```
Points
```

Out[110…
```
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 [112…
```
Points[-6,-1]
```

Out[112…
```
646
```

In [114…
```
dict1={'key1':'val1','key2':'val2','key3':'val3'}
```

In [116…
```
dict1
```

Out[116…
```
{'key1': 'val1', 'key2': 'val2', 'key3': 'val3'}
```

In [118…
```
dict1['key2']
```

Out[118…
```
'val2'
```

In [120…
```
dict2={'bang':2,'hyd':'we are hear','pune':True}
```

In [122…
```
dict2
```

Out[122…
```
{'bang': 2, 'hyd': 'we are hear', 'pune': True}
```

In [124…
```
dict3={'Germany':'I have been here','France':2,'spain':True}
```

In [126…
```
dict3
```

Out[126…
```
{'Germany': 'I have been here', 'France': 2, 'spain': True}
```

In [128…
```
dict3['Germany']
```

Out[128…
```
'I have been here'
```

In [130…
```
Games
```

Out[130…
```
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 [132…
```
Pdict
```

Out[132…
```
{'Sachin': 0,
 'Rahul': 1,
 'Smith': 2,
 'Sami': 3,
 'Pollard': 4,
 'Morris': 5,
 'Samson': 6,
 'Dhoni': 7,
 'Kohli': 8,
 'Sky': 9}
```

In [136…
```
Pdict['Sachin']
```

Out[136…
```
0
```

In [138…
```
Games[0]
```

Out[138…
```
array([80, 77, 82, 82, 73, 82, 58, 78,  6, 35])
```

In [140…
```
Games
```

Out[140…
```
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 [142…
```
Pdict['Rahul']
```

Out[142…
```
1
```

In [144…
```
Games[1]
```

Out[144…
```
array([82, 57, 82, 79, 76, 72, 60, 72, 79, 80])
```

# Games

In [149…
```
Games[Pdict['Rahul']]
```

Out[149…
```
array([82, 57, 82, 79, 76, 72, 60, 72, 79, 80])
```

In [151…
```
Points
```

Out[151…
```
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 [23]:
```
Salary
```

Out[23]:
```
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 [153…
```
Salary[2,4]
```

Out[153…
```
15779912
```

In [157…
```
Salary[Pdict['Sky']][Sdict['2019']]
```

Out[157…
```
15779912
```

In [159…
```
Salary|Games
```

Out[159…
```
array([[15946875, 17718751, 19490643, 21262582, 23034447, 24806266,
        25244543, 27849215, 30453807, 23500003],
       [12000082, 12744189, 13488379, 14232575, 14976766, 16324572,
        18038589, 19752653, 21466719, 23180790],
       [ 4621807,  5828094, 13041259, 14410581, 15779916, 14500079,
        16022526, 17545068, 19067501, 20644469],
       [ 3713656,  4694105, 13041263, 14410583, 15779917, 17149311,
        18518591, 19450067, 22407551, 22458040],
       [ 4493178,  4806738,  6061274, 13758079, 15202654, 16647246,
        18091774, 19536364, 20513247, 21436271],
       [ 3348070,  4235221, 12455003, 14410589, 15779918, 14500077,
        16022525, 17545066, 19067503, 20644412],
       [ 3144318,  3380160,  3615960,  4574191, 13520509, 14940153,
        16359805, 17779526, 18668479, 20068563],
       [      35,       35,  4171216,  4484042,  4796882,  6053727,
        15506634, 16669695, 17832691, 18995643],
       [      40,       40,       40,  4822865,  5184494,  5546225,
         6993711, 16402500, 17632698, 18862907],
       [ 3031931,  3841459, 13041267, 14410591, 15779917, 14200012,
        15691001, 17182069, 18673022, 15000062]])
```

In [161…
```
np.round(Salary%Games)
```

```
C:\Users\91630\AppData\Local\Temp\ipykernel_4536\2295710325.py:1: RuntimeWarning:
divide by zero encountered in remainder
  np.round(Salary%Games)
```

Out[161…
```
array([[75, 49, 45, 64, 28, 20, 51, 29,  1, 20],
       [38, 15, 33,  6, 42, 12, 53, 21, 48, 70],
       [63,  8, 25, 33, 32, 24, 26, 20, 67, 14],
       [40,  1, 68,  9, 26, 34, 19, 34, 12,  0],
       [52, 44, 80, 71, 36, 30, 42, 28,  0, 36],
       [40,  0, 35, 31, 22, 53, 28, 44, 60, 40],
       [60,  0, 40, 35, 25, 73, 25, 18, 45, 47],
       [ 0,  0,  0, 10, 44,  5, 64, 73, 72, 17],
       [ 0,  0,  0, 60, 54,  9, 33,  0,  8, 15],
       [45, 21, 40, 33, 71,  8, 24, 34, 16, 30]])
```

In [163…
```
Salary%Games
```

```
C:\Users\91630\AppData\Local\Temp\ipykernel_4536\2579178082.py:1: RuntimeWarning:
divide by zero encountered in remainder
  Salary%Games
```

Out[163…
```
array([[75, 49, 45, 64, 28, 20, 51, 29,  1, 20],
       [38, 15, 33,  6, 42, 12, 53, 21, 48, 70],
       [63,  8, 25, 33, 32, 24, 26, 20, 67, 14],
       [40,  1, 68,  9, 26, 34, 19, 34, 12,  0],
       [52, 44, 80, 71, 36, 30, 42, 28,  0, 36],
       [40,  0, 35, 31, 22, 53, 28, 44, 60, 40],
       [60,  0, 40, 35, 25, 73, 25, 18, 45, 47],
       [ 0,  0,  0, 10, 44,  5, 64, 73, 72, 17],
       [ 0,  0,  0, 60, 54,  9, 33,  0,  8, 15],
       [45, 21, 40, 33, 71,  8, 24, 34, 16, 30]])
```

In [35]:
```
import warnings
warnings.filterwarnings('ignore')
```

In [165…
```
import numpy as np
import matplotlib.pyplot as plt
```

In [171…
```
%matplotlib inline
```

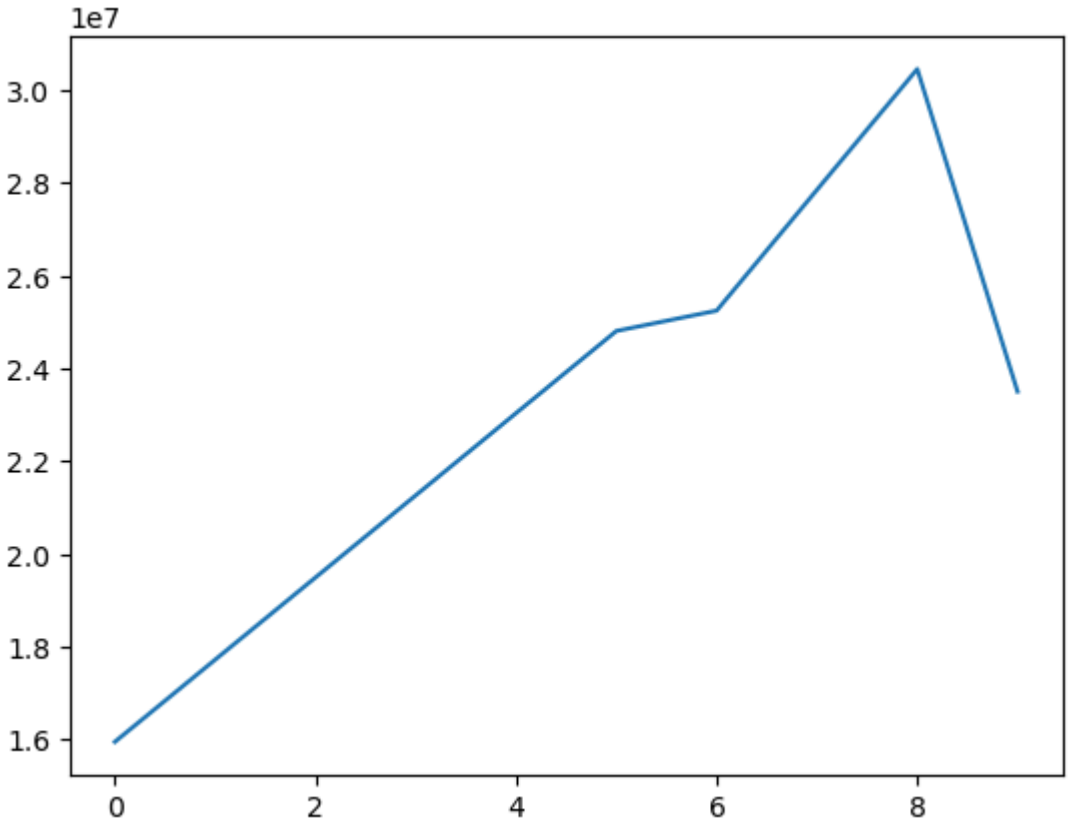
In [167…
```
Salary
```

Out[167…
```
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]])
```

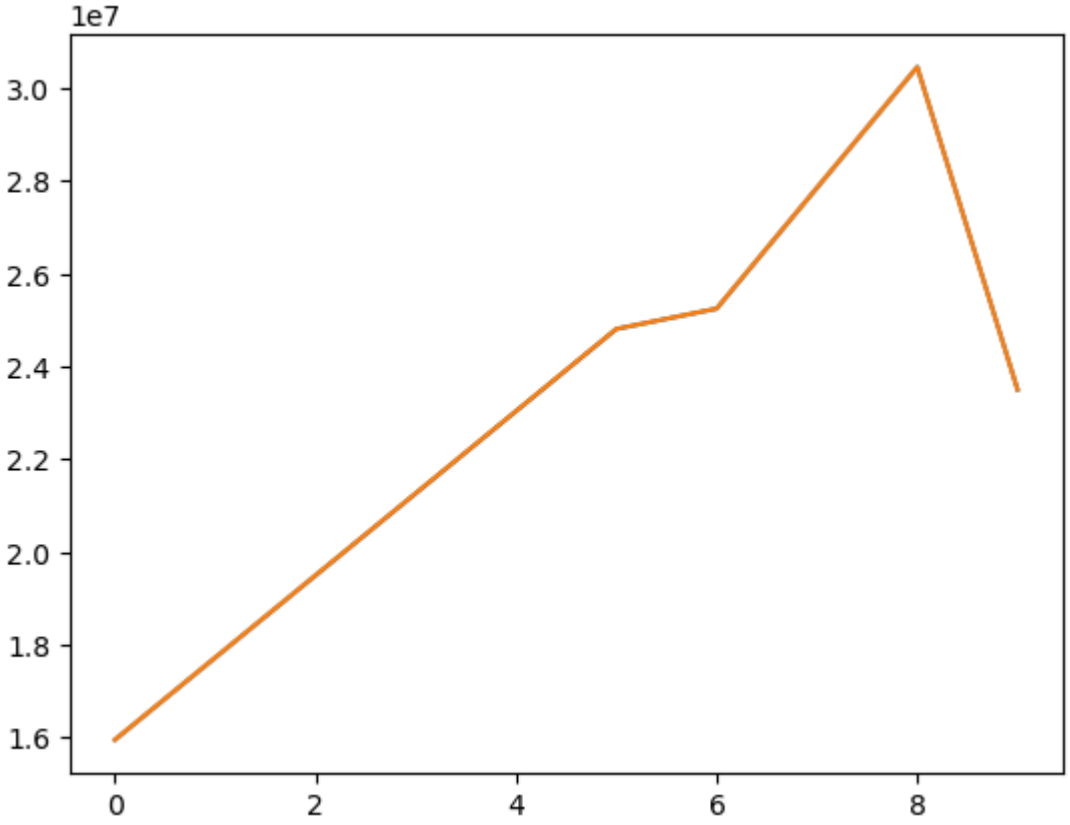
In [173…
```
Salary[0]
```

Out[173…
```
array([15946875, 17718750, 19490625, 21262500, 23034375, 24806250,
       25244493, 27849149, 30453805, 23500000])
```

In [179…
```
plt.plot(Salary[0])
plt.show()
```

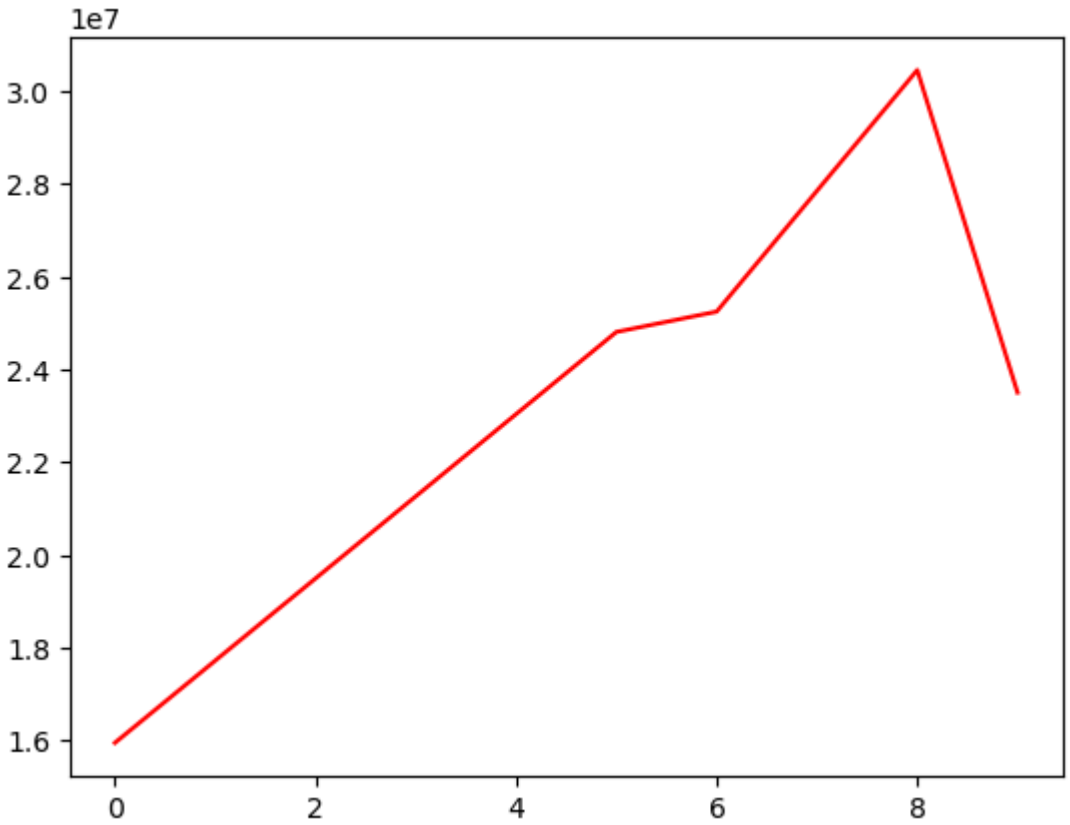


In [177…
```
plt.plot(Salary[0])
plt.show()
```



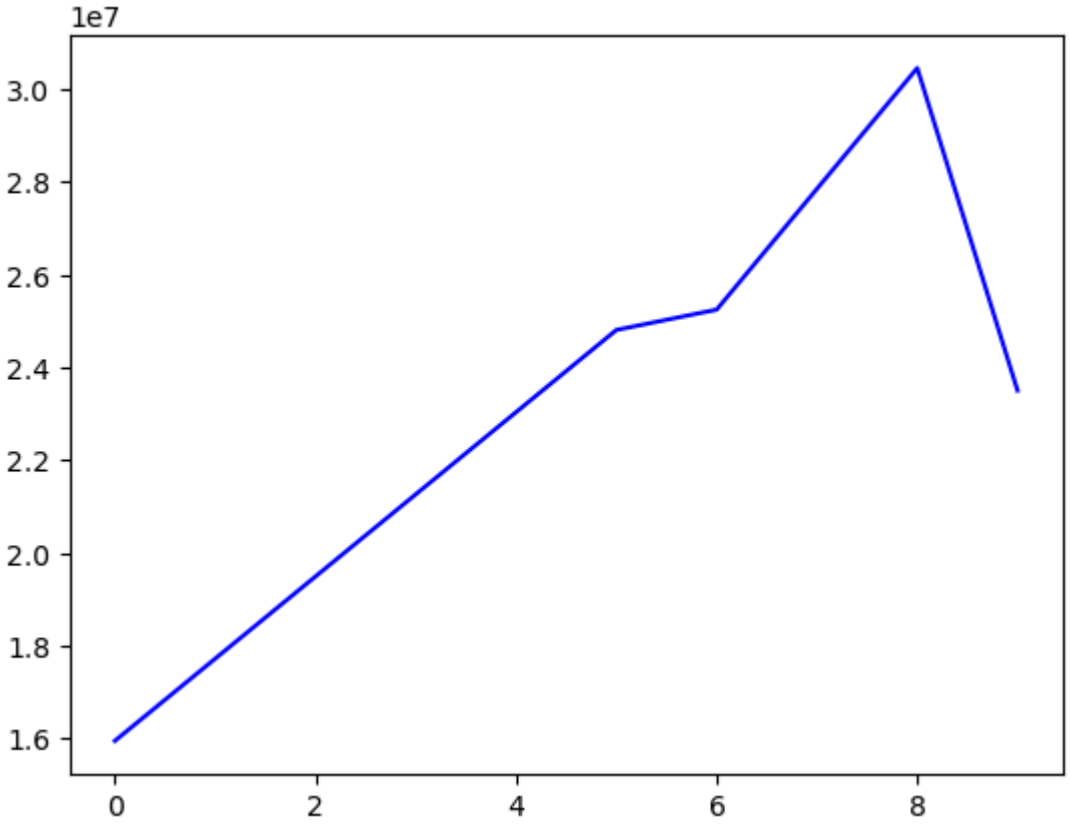

Insight1 : based on above graph sachin salary increase till 2023 & then it has decreases

In [52]:
```
plt.plot(Salary[0],color='r')
plt.show()
```

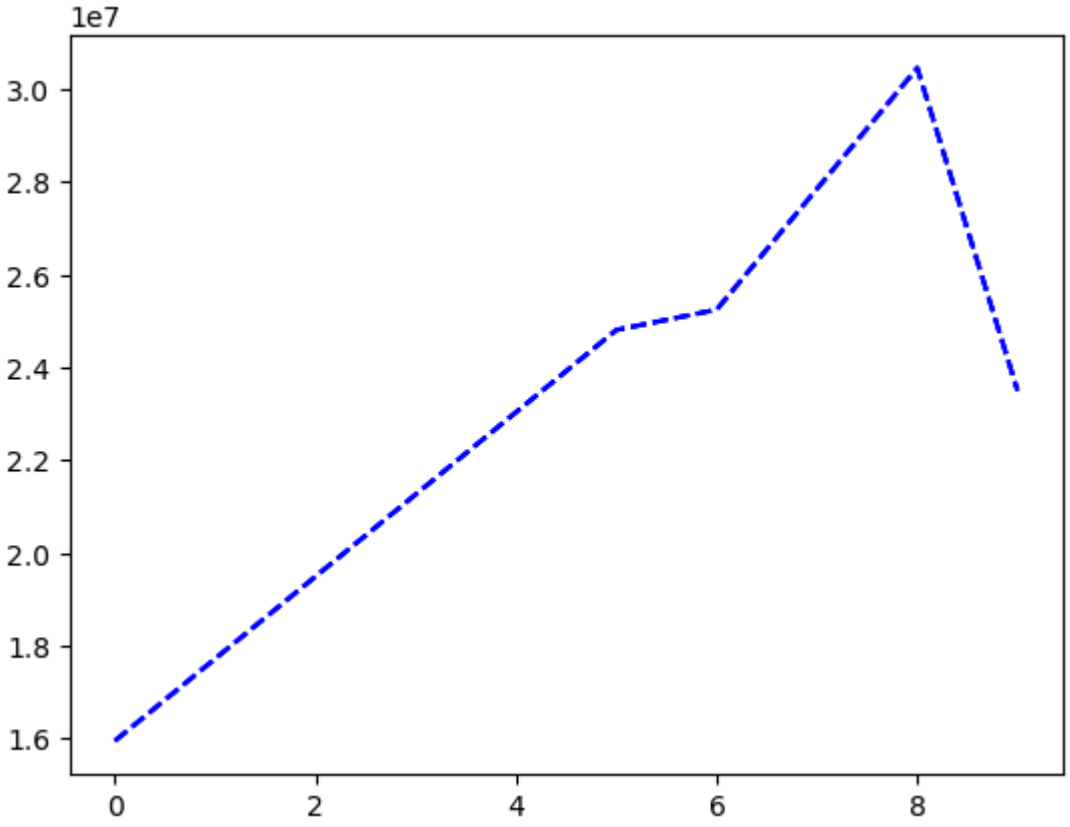


In [54]:
```
plt.plot(Salary[0],c='b')
```

Out[54]:
```
[<matplotlib.lines.Line2D at 0x22b74231b20>]
```

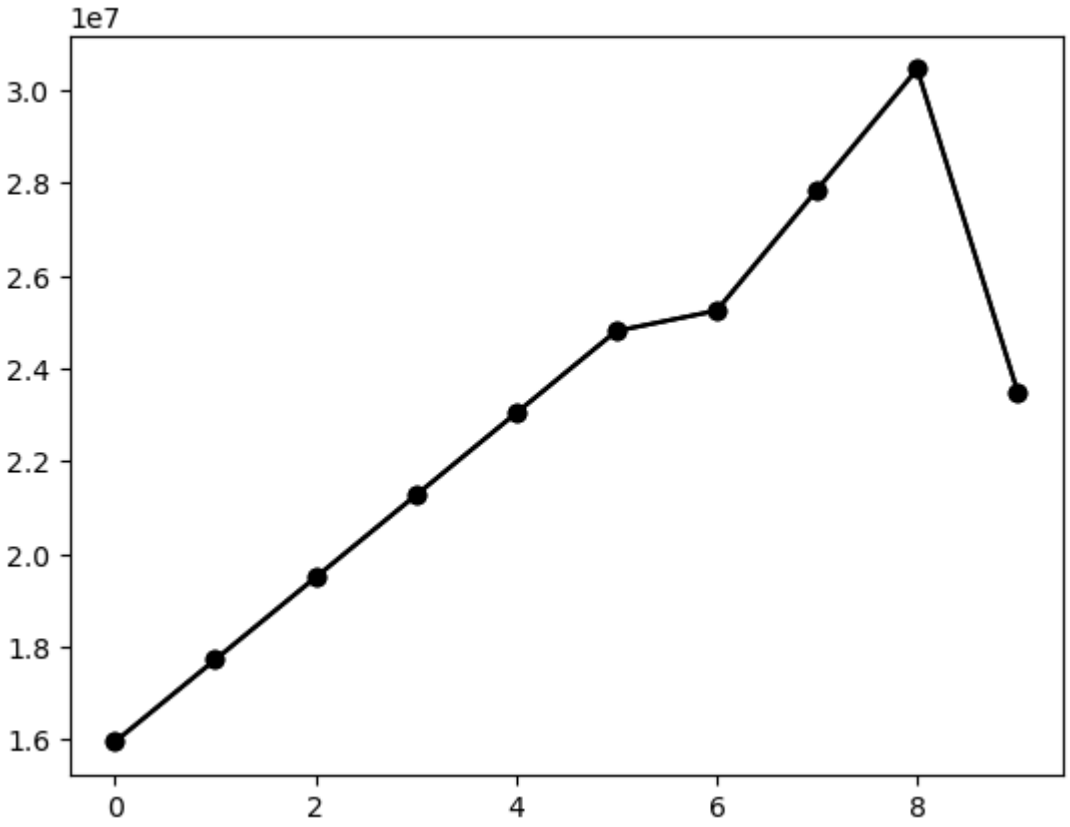



In [185…
```
plt.plot(Salary[0],c='blue',ls='dashed')
plt.show()
```



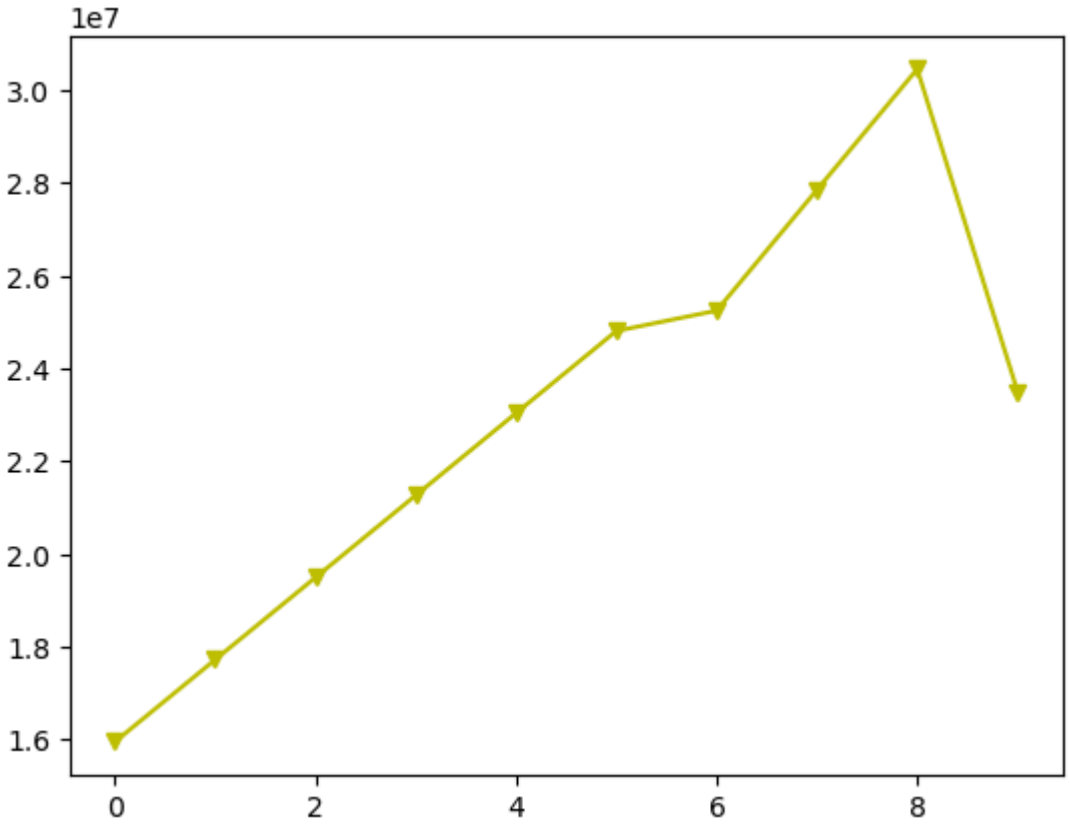
In [189…

```
plt.plot(Salary[0],c='k',marker='o')
plt.show()
```

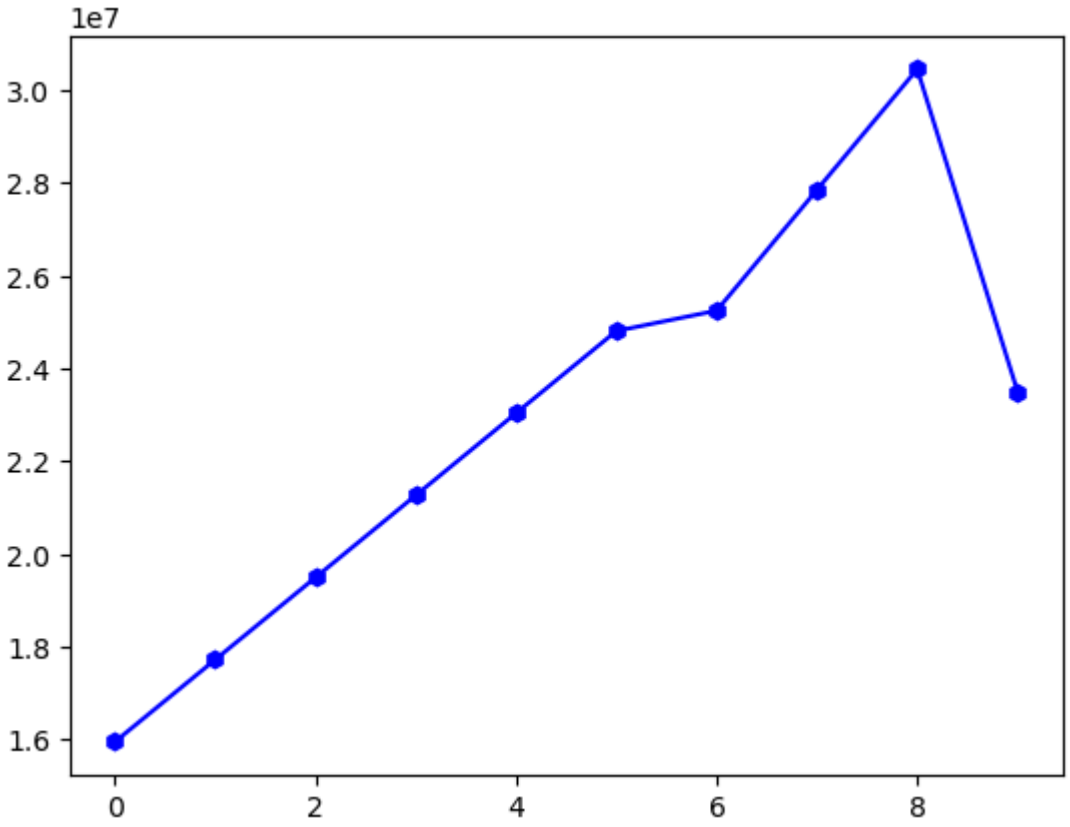



In [191…

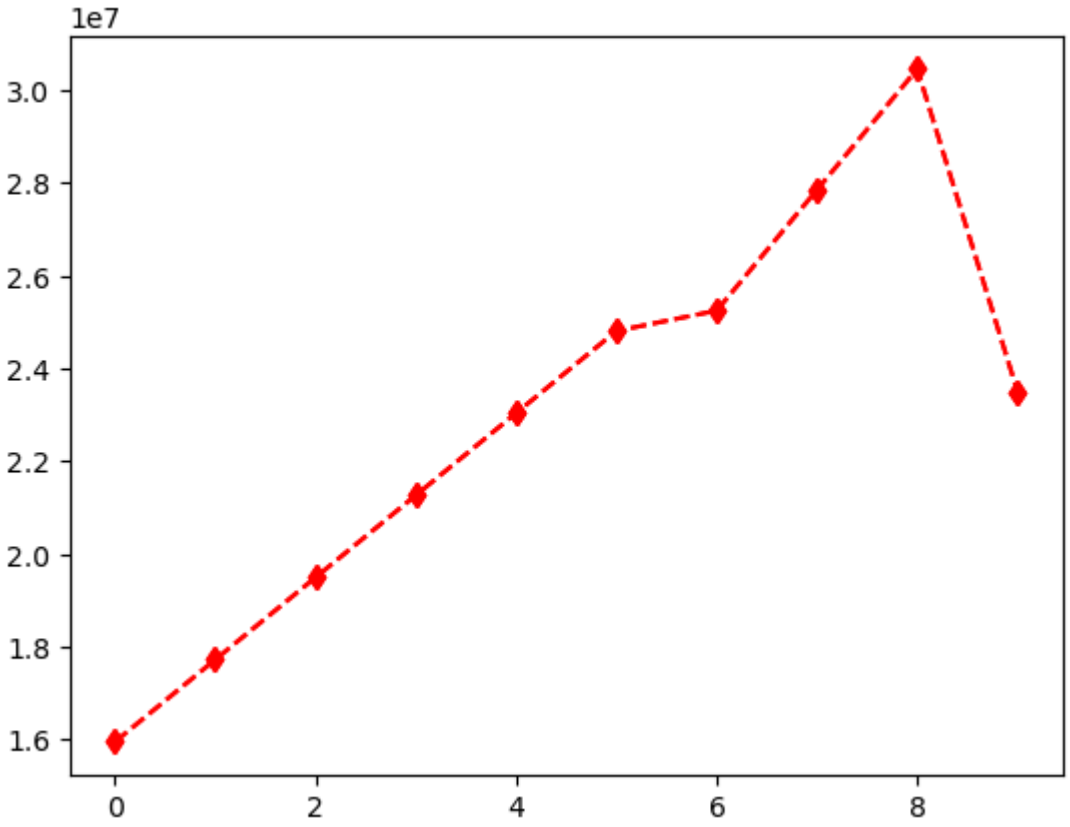
```
plt.plot(Salary[0],c='y',marker='v')
plt.show()
```



In [193…
```
plt.plot(Salary[0],c='b',marker='h')
plt.show()
```

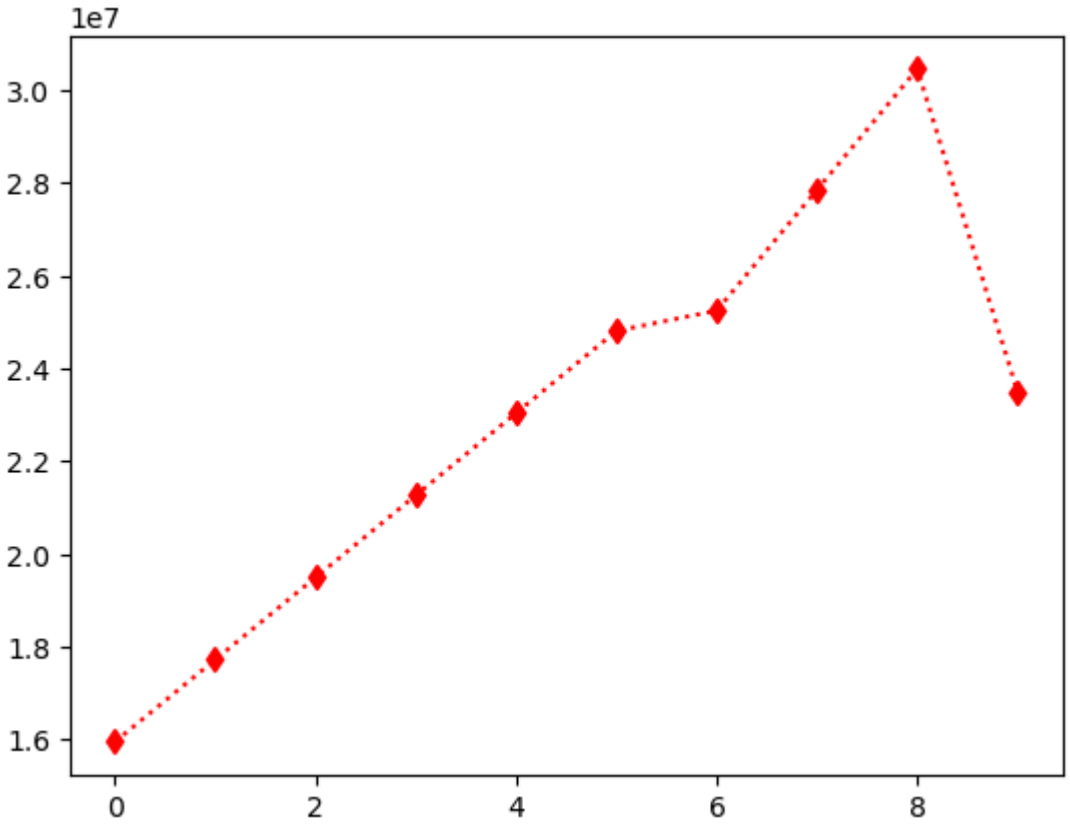



In [197…
```
plt.plot(Salary[0],c='r',marker='d',ls='--')
plt.show()
```



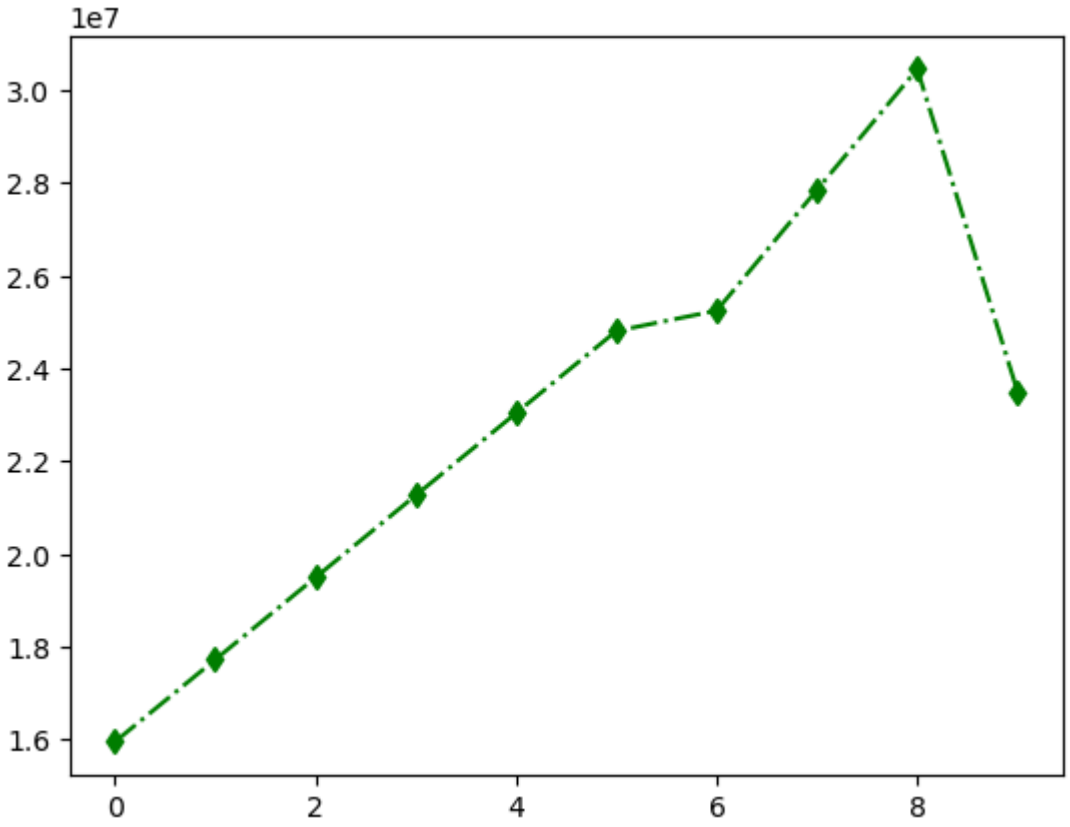
In [199…

```
plt.plot(Salary[0],c='r',marker='d',ls=':')
plt.show()
```

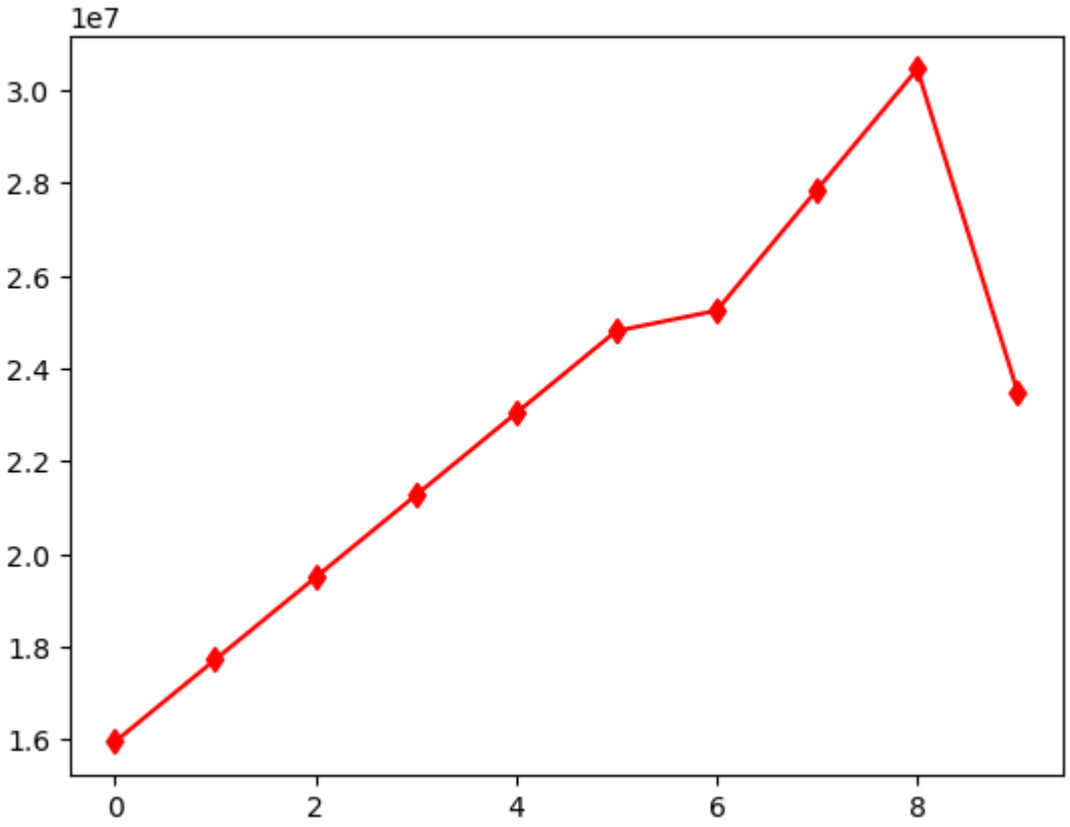



In [201…

```
plt.plot(Salary[0],c='g',marker='d',ls='-.')
plt.show()
```

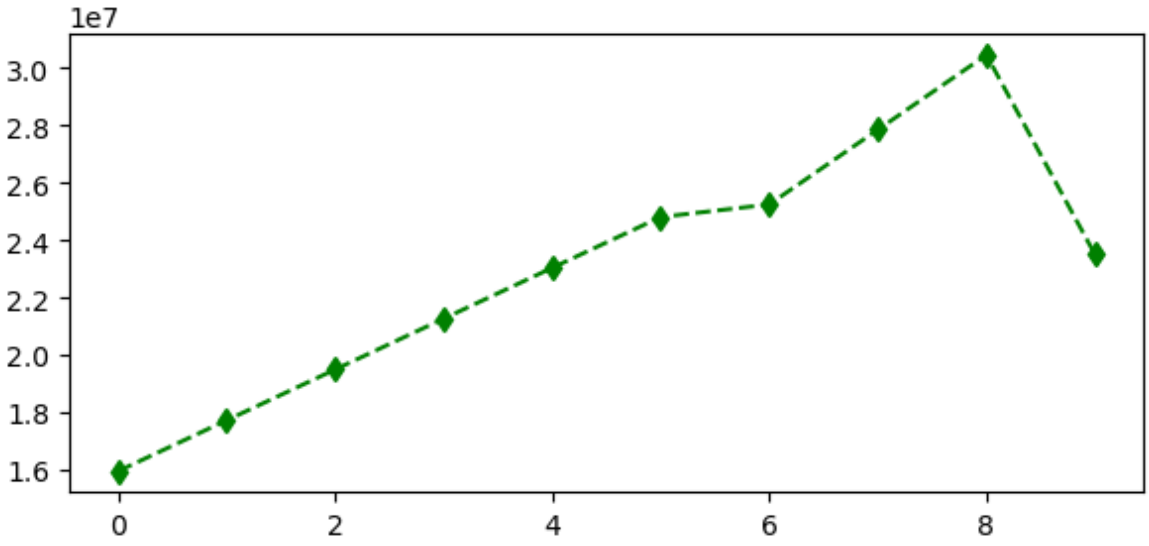


In [203…
```
plt.plot(Salary[0],c='r',marker='d',ls='-')
plt.show()
```

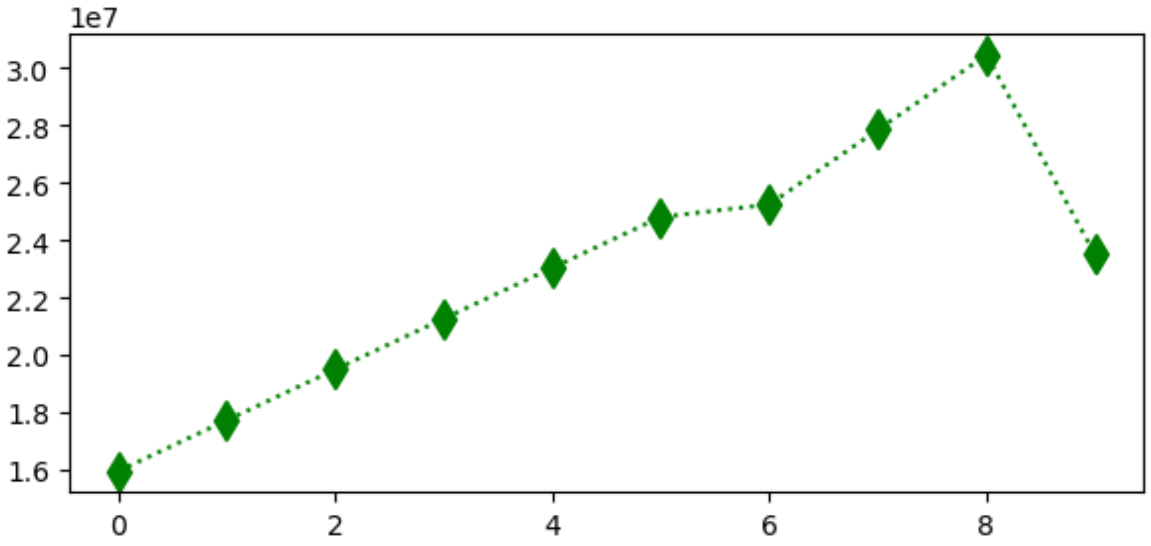



In [205…
```
%matplotlib inline
plt.rcParams['figure.figsize']=7,3 #7- width ,3-height
```

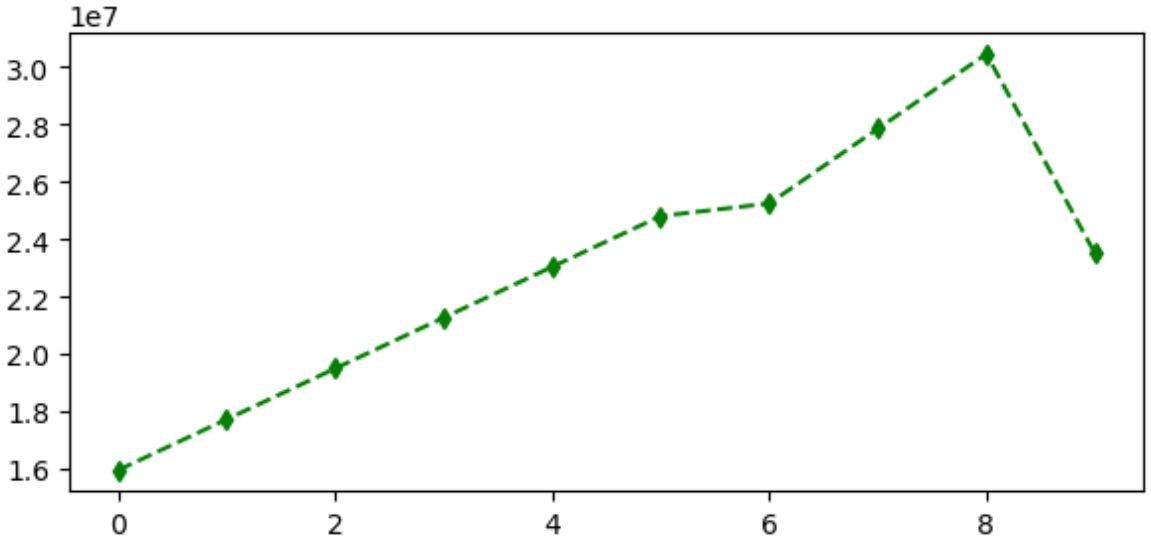
In [207…
```
plt.plot(Salary[0],c='g',marker='d',ls='--')
plt.show()
```




In [209…
```
plt.plot(Salary[0],c='g',marker='d',ls=':', ms=10)
plt.show()
```




In [211…
```
plt.plot(Salary[0],c='g',marker='d',ls='--',ms=5)
plt.show()
```




In [213…
```
list(range(0,10))
```

Out[213…
```
[0, 1, 2, 3, 4, 5, 6, 7, 8, 9]
```

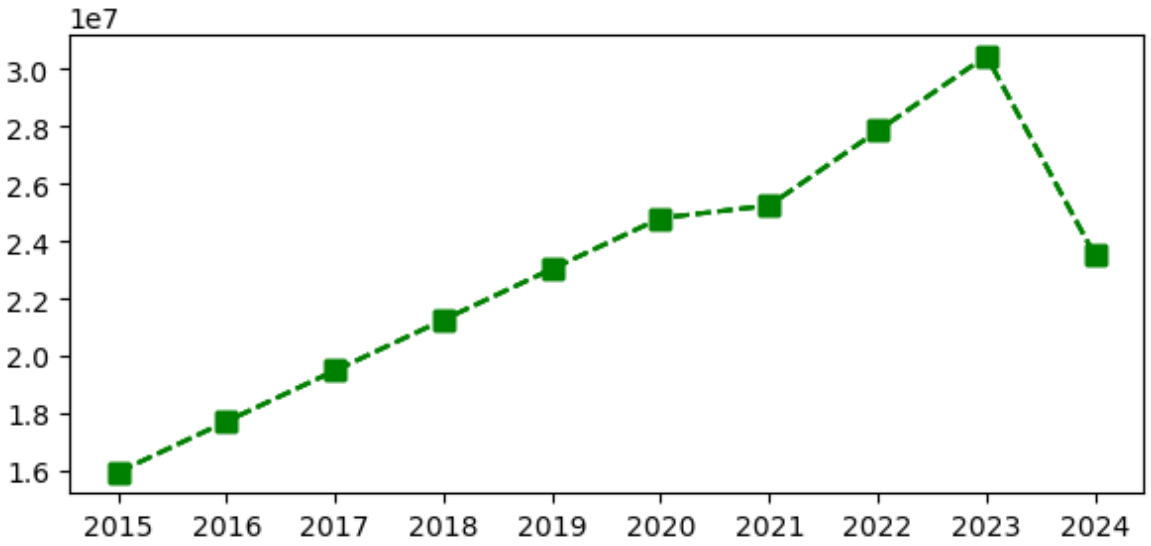
In [215…
```
Sdict
```

Out[215…
```
{'2015': 0,
 '2016': 1,
 '2017': 2,
 '2018': 3,
 '2019': 4,
 '2020': 5,
 '2021': 6,
 '2022': 7,
 '2023': 8,
 '2024': 9}
```

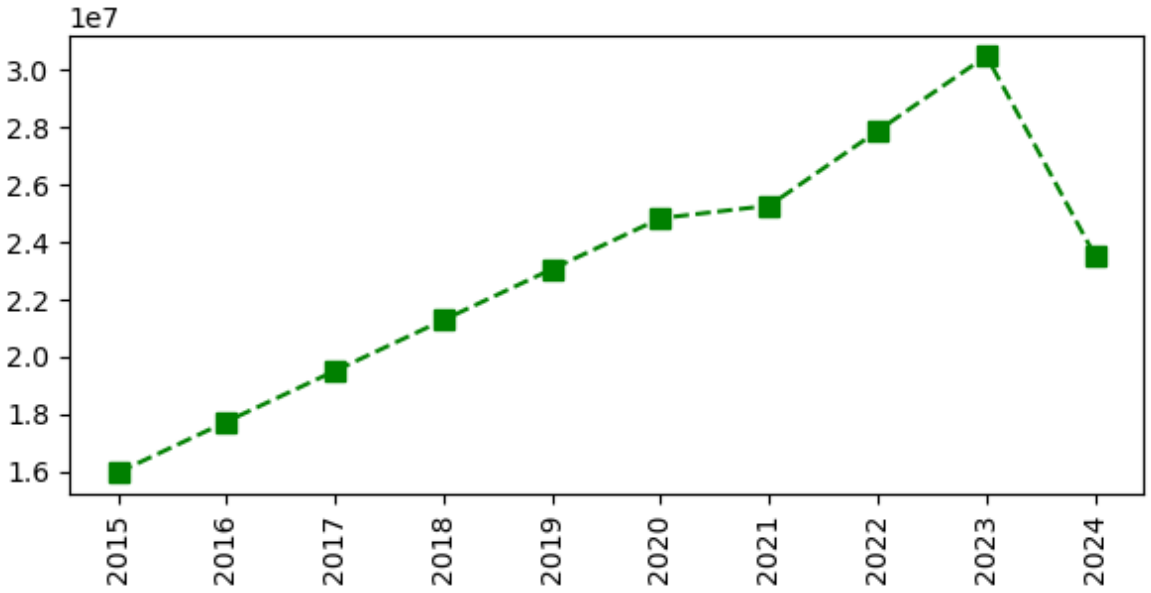
In [217…
```
Pdict
```

Out[217…
```
{'Sachin': 0,
 'Rahul': 1,
 'Smith': 2,
 'Sami': 3,
 'Pollard': 4,
 'Morris': 5,
 'Samson': 6,
 'Dhoni': 7,
 'Kohli': 8,
 'Sky': 9}
```

In [227…
```
plt.plot(Salary[0],c='g',ls='--',marker='s',ms=7)
plt.xticks(list(range(0,10)),Seasons)
plt.show()
```



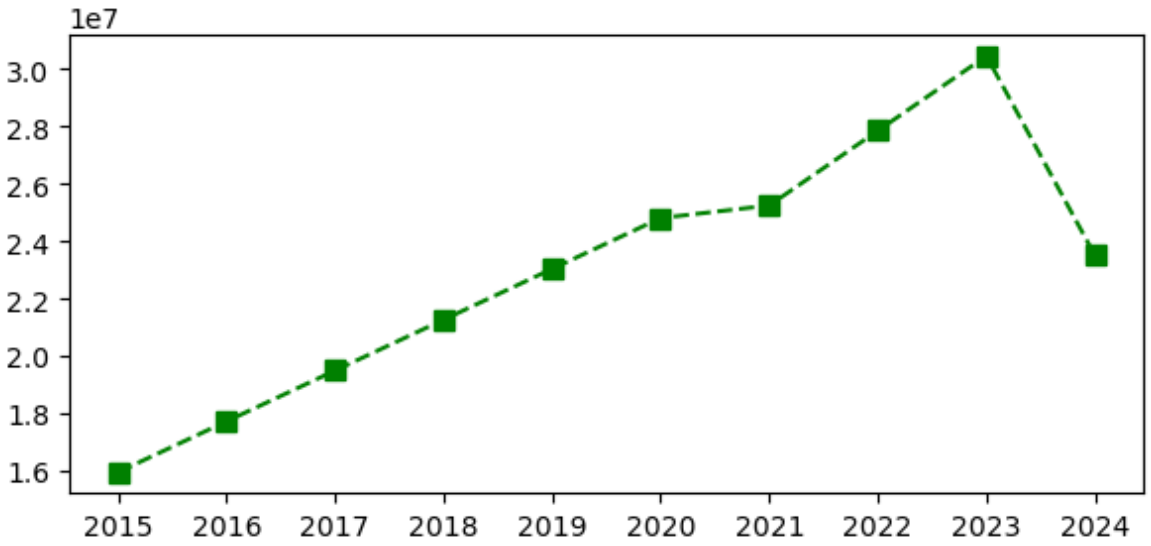

In [231…
```
plt.plot(Salary[0],c='g',ls='--',marker='s',ms=7,label=Players[0])
plt.xticks(list(range(0,10)),Seasons,rotation='vertical')
plt.show()
```




In [233…
```
Games
```

Out[233…
```
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 [235…
```
plt.plot(Salary[0],c='g',ls='--',marker='s',ms=7,label=Players[0])
plt.xticks(list(range(0,10)),Seasons,rotation='horizontal')
plt.show()
```



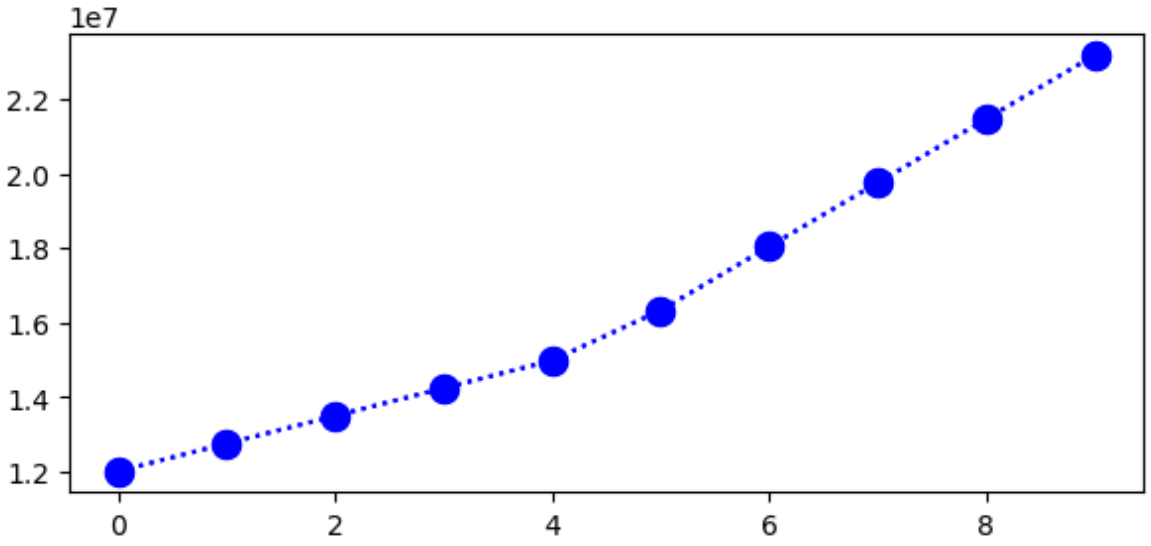

In [237…
```
Salary[0]
```

Out[237…
```
array([15946875, 17718750, 19490625, 21262500, 23034375, 24806250,
       25244493, 27849149, 30453805, 23500000])
```

In [239…
```
Salary[1]
```

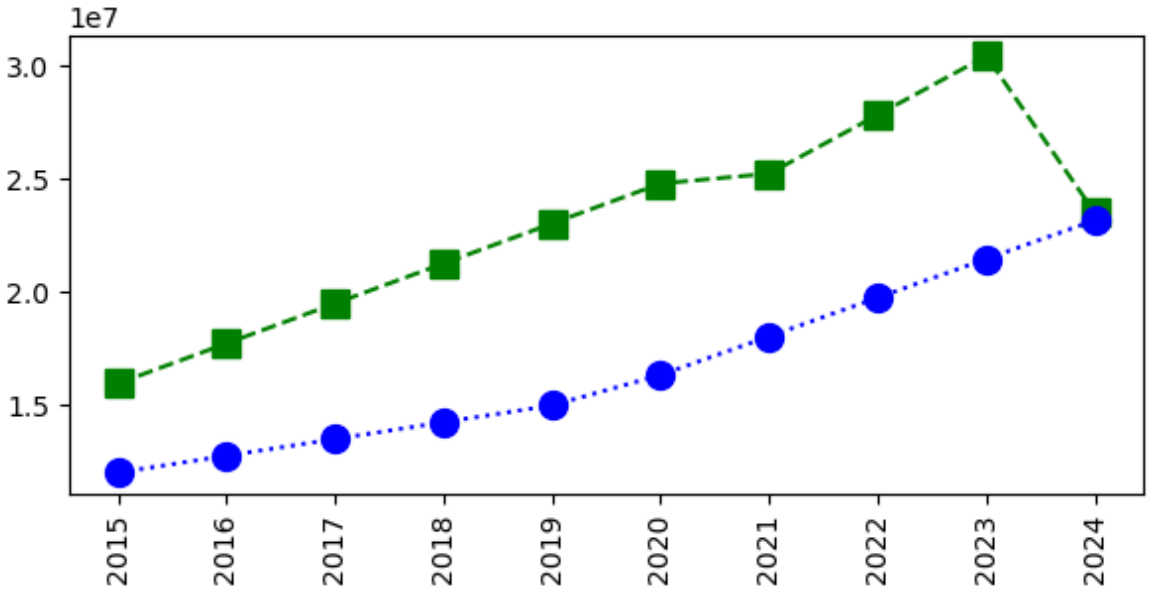
Out[239…
```
array([12000000, 12744189, 13488377, 14232567, 14976754, 16324500,
       18038573, 19752645, 21466718, 23180790])
```

In [249…
```
plt.plot(Salary[1],c='b',ls=':',marker='o',ms=10,label=Players[1])
plt.show()
```



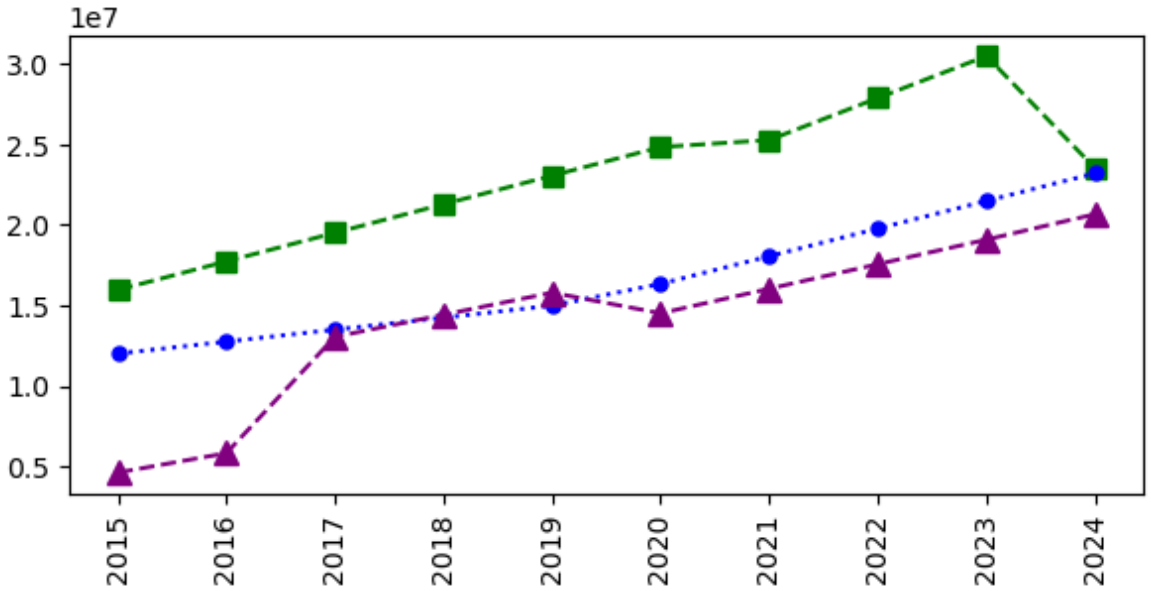

In [251…

```
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()
```



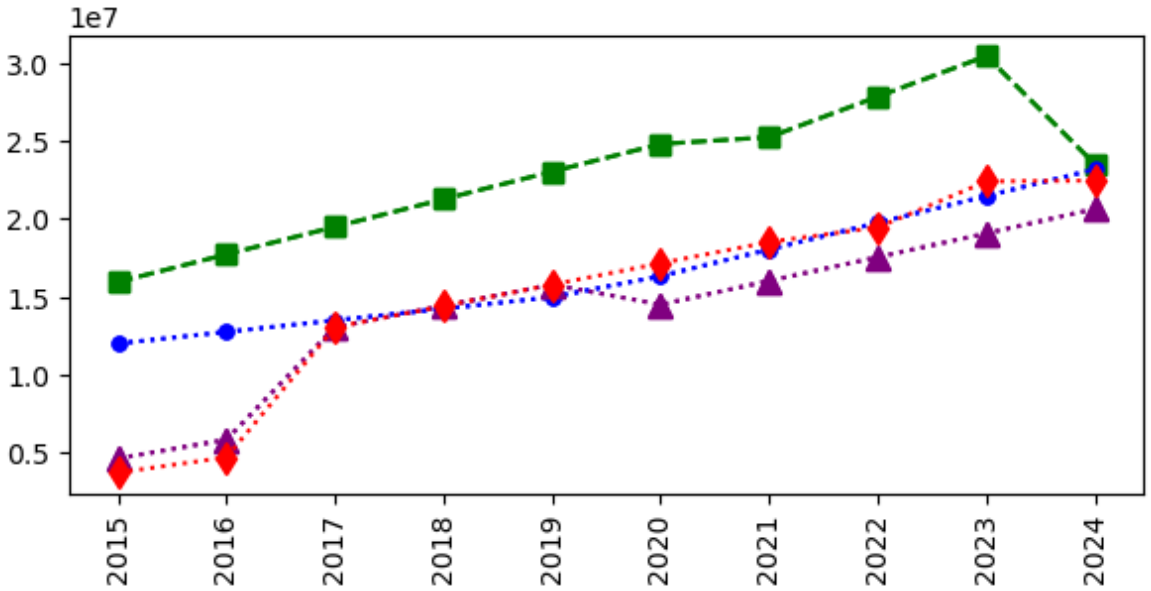

In [257…

```
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()
```



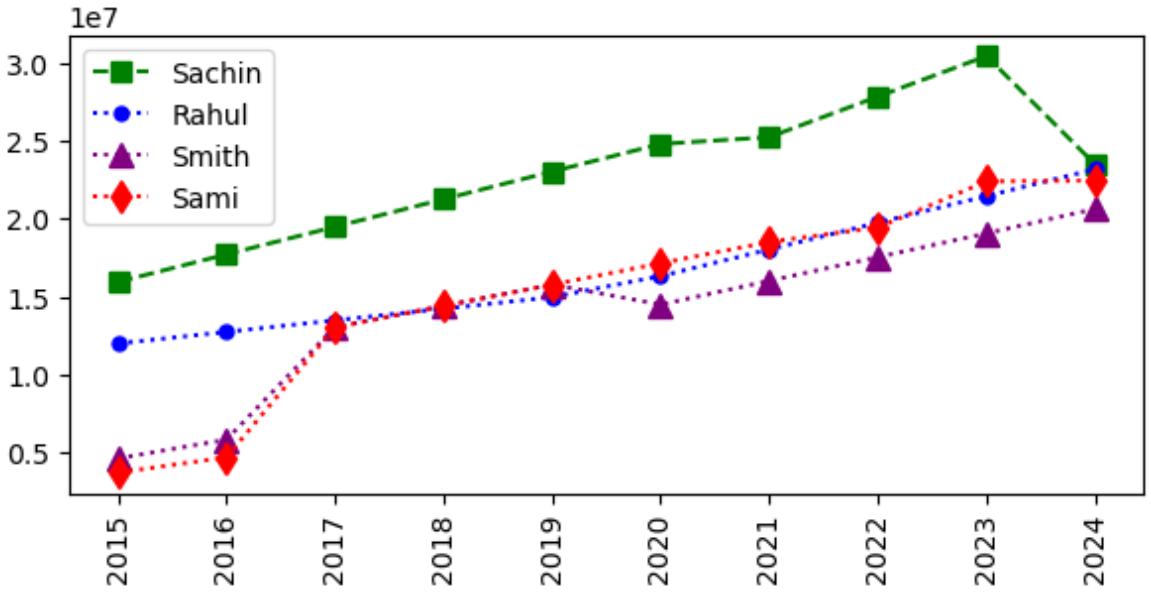

In [265…

```
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()
```



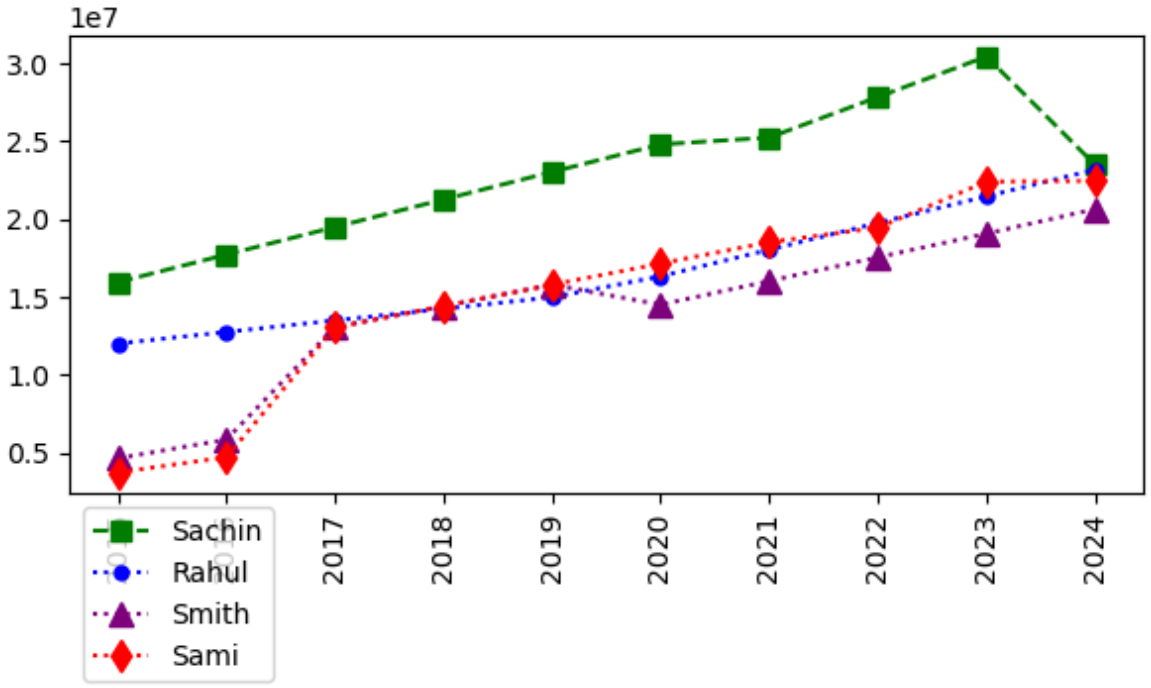

In [267…

```
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()
```



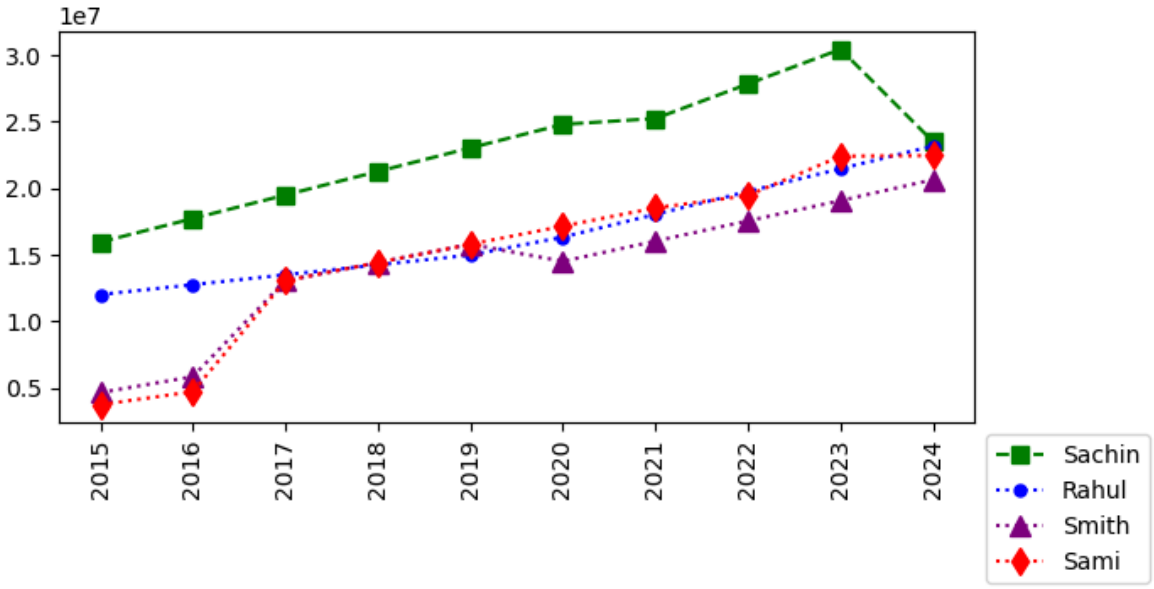

In [269…

```
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()
```



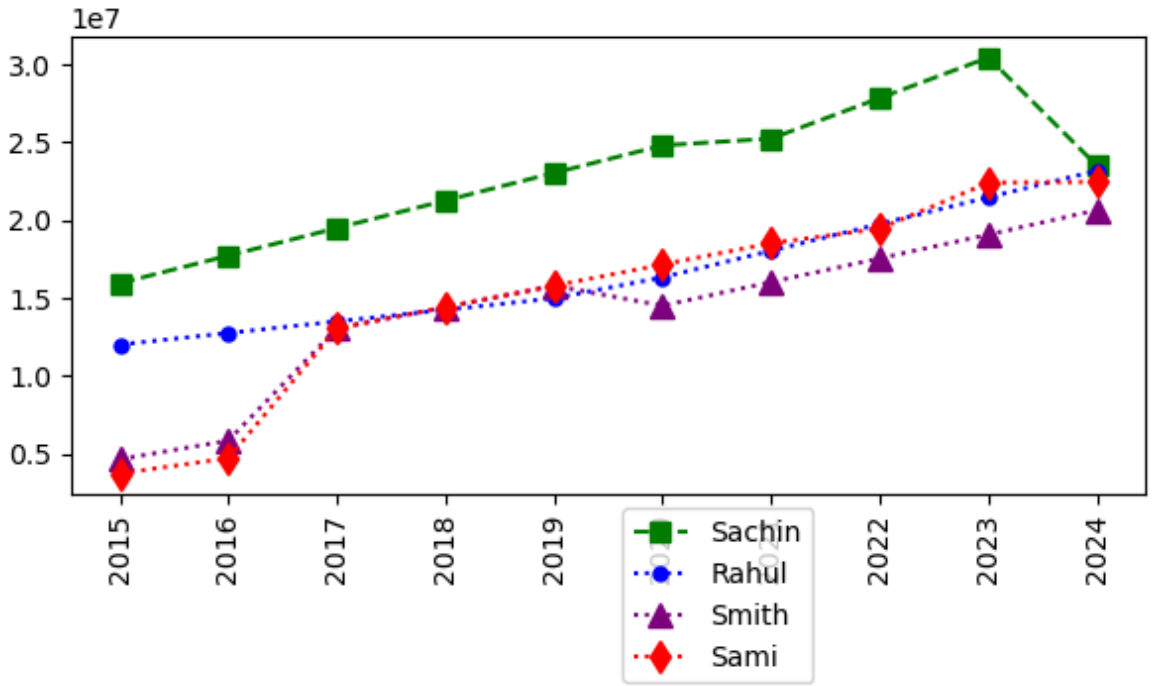

In [271…

```
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=(1,0))
plt.xticks(list(range(0,10)),Seasons,rotation='vertical')
plt.show()
```




In [273…

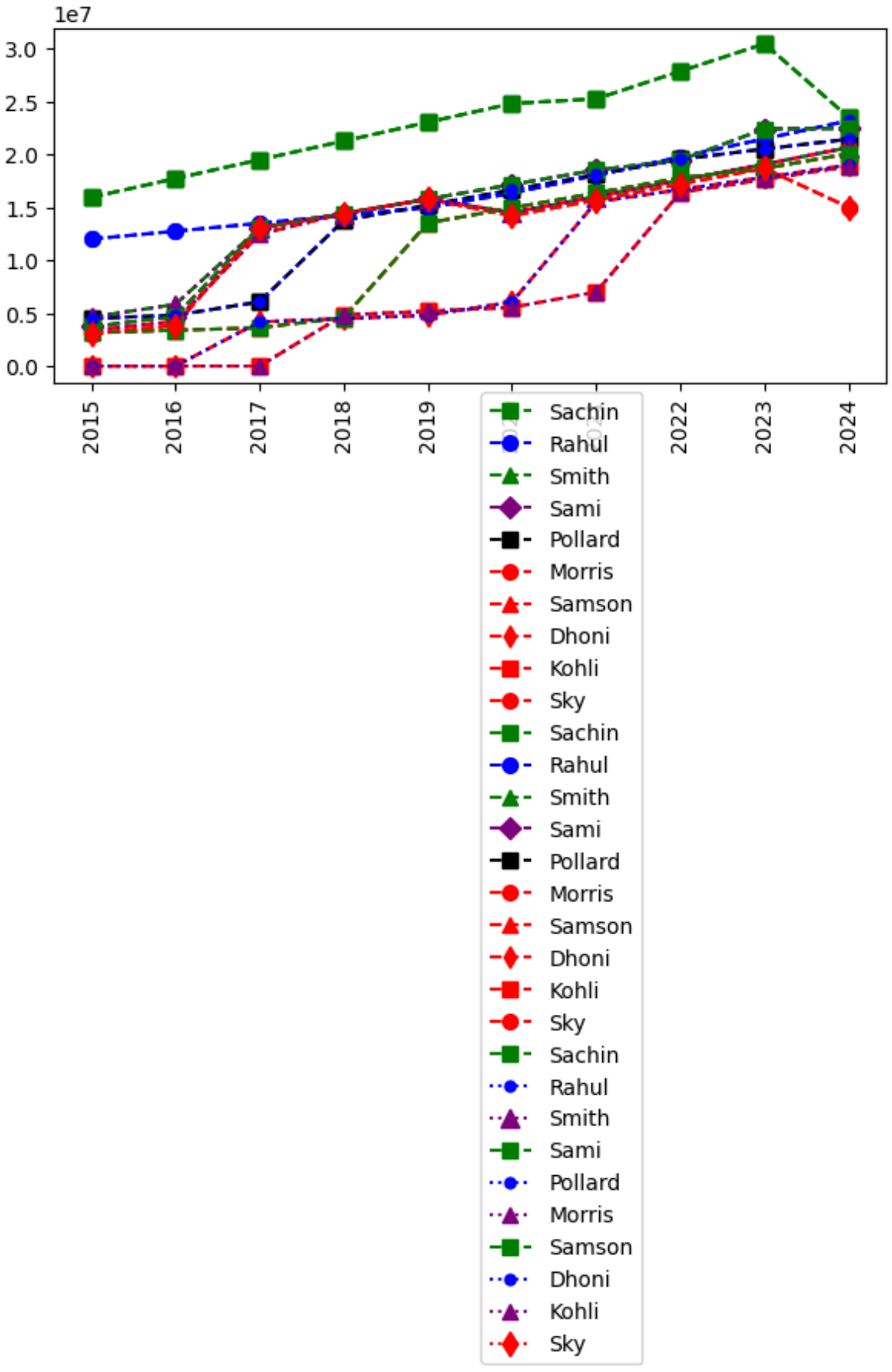
```
plt.plot(Salary[0],c='Green',ls='--',marker='s',ms=7,label=Players[0])
plt.plot(Salary[1],c='Blue',ls=':',marker='o',ms=5,label=Players[1])
plt.plot(Salary[2],c='purple',ls=':',marker='^',ms=8,label=Players[2])
plt.plot(Salary[3],c='Red',ls=':',marker='d',ms=8,label=Players[3])
plt.legend(loc='upper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




In [280…

```
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='Green',ls='--',marker='s',ms=7,label=Players[3])
plt.plot(Salary[4],c='Blue',ls=':',marker='o',ms=5,label=Players[4])
plt.plot(Salary[5],c='purple',ls=':',marker='^',ms=7,label=Players[5])
plt.plot(Salary[6],c='Green',ls='--',marker='s',ms=7,label=Players[6])
plt.plot(Salary[7],c='Blue',ls=':',marker='o',ms=5,label=Players[7])
plt.plot(Salary[8],c='purple',ls=':',marker='^',ms=7,label=Players[8])
plt.plot(Salary[9],c='Red',ls=':',marker='d',ms=8,label=Players[9])
plt.legend(loc='upper left',bbox_to_anchor=(0.5,0))
```

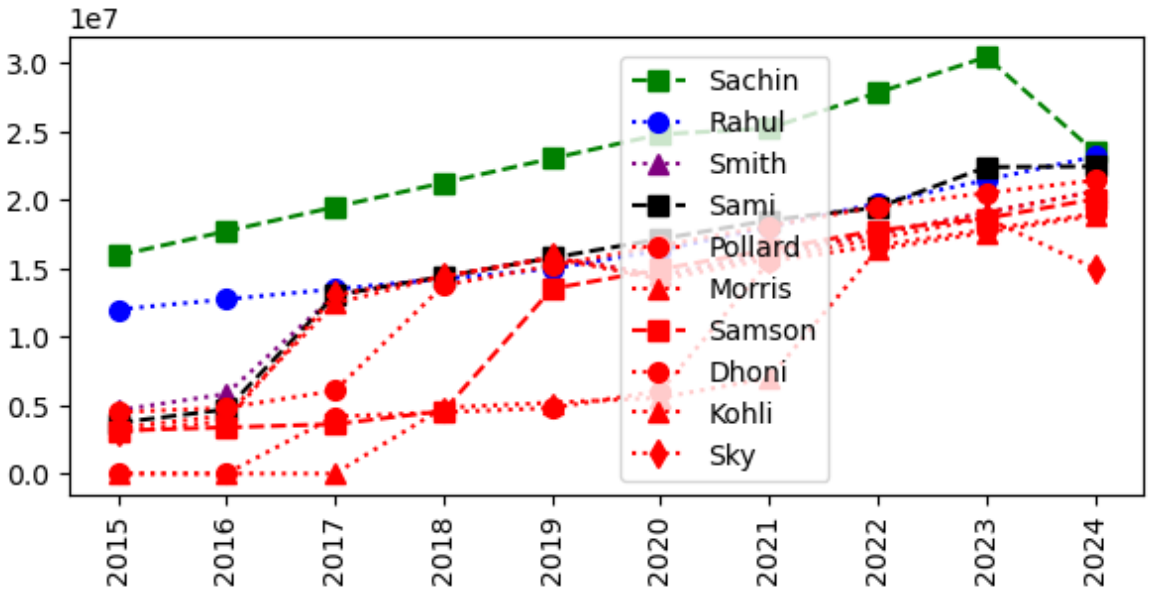
```
plt.xticks(list(range(0,10)),Seasons,rotation='vertical')
plt.show()
```




In [292…

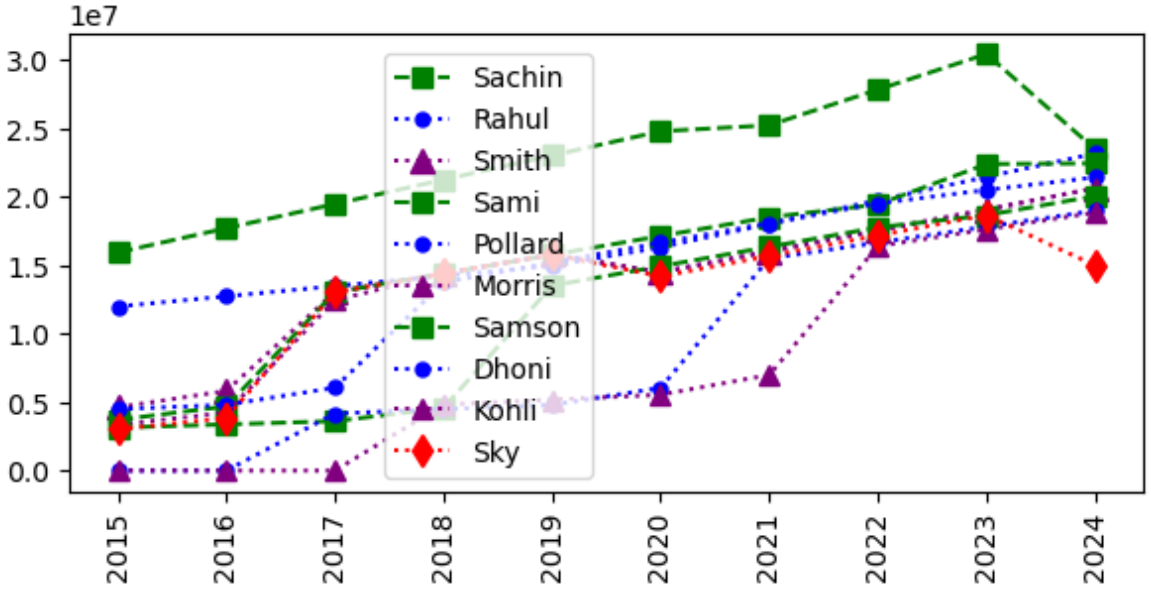
```
plt.plot(Salary[0],c='Green',ls='--',marker='s',ms=7,label=Players[0])
plt.plot(Salary[1],c='Blue',ls=':',marker='o',ms=7,label=Players[1])
plt.plot(Salary[2],c='Purple',ls=':',marker='^',ms=7,label=Players[2])
```

```
plt.plot(Salary[3],c='Black',ls='--',marker='s',ms=7,label=Players[3])
plt.plot(Salary[4],c='red',ls=':',marker='o',ms=7,label=Players[4])
plt.plot(Salary[5],c='red',ls=':',marker='^',ms=7,label=Players[5])
plt.plot(Salary[6],c='red',ls='--',marker='s',ms=7,label=Players[6])
plt.plot(Salary[7],c='red',ls=':',marker='o',ms=7,label=Players[7])
plt.plot(Salary[8],c='red',ls=':',marker='^',ms=7,label=Players[8])
plt.plot(Salary[9],c='red',ls=':',marker='d',ms=7,label=Players[9])
plt.legend(loc='lower left',bbox_to_anchor=(0.5,0))
plt.xticks(list(range(0,10)),Seasons,rotation='vertical')
plt.show()
```




In [290…

```
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='Green',ls='--',marker='s',ms=7,label=Players[3])
plt.plot(Salary[4],c='Blue',ls=':',marker='o',ms=5,label=Players[4])
plt.plot(Salary[5],c='purple',ls=':',marker='^',ms=7,label=Players[5])
plt.plot(Salary[6],c='Green',ls='--',marker='s',ms=7,label=Players[6])
plt.plot(Salary[7],c='Blue',ls=':',marker='o',ms=5,label=Players[7])
plt.plot(Salary[8],c='purple',ls=':',marker='^',ms=7,label=Players[8])
plt.plot(Salary[9],c='Red',ls=':',marker='d',ms=8,label=Players[9])
plt.legend(loc='lower right',bbox_to_anchor=(0.5,0))
plt.xticks(list(range(0,10)),Seasons,rotation='vertical')
plt.show()
```


1e7
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Sachin
Rahul
Smith
Sami
Pollard
Morris
Samson
Dhoni
Kohli
Sky
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024

In [ ]:

In [ ]:

In [ ]: