MATRICES / NUMPY -----

- Matrix is the tabular representation of the data
- Lot of datas are stored in table format,that is why Matrices is very very important topic in python
- as we working on dataframe so matrices are played a major rule
- List is one dimension & matrix is multidimension
- indexation is very important to plot the datapoints
- hear i have taken top 10 highest paid player in 2010-2019 season
- lets analyze the statistics of the cricket players

In [2]:
```
#Import numpy
import numpy as np

#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, Samso

#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, K
```

In [3]:
```
Players
```

Out[3]:
```
['Sachin',
 'Rahul',
 'Smith',
 'Sami',
 'Pollard',
 'Morris',
 'Samson',
 'Dhoni',
 'Kohli',
 'Sky']
```

In [4]:
```
Seasons
```

Out[4]:
```
['2010',
 '2011',
 '2012',
 '2013',
 '2014',
 '2015',
 '2016',
 '2017',
 '2018',
 '2019']
```

In [5]:
```
#building the matrix forms
Games
```

Out[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]])
```

In [6]:
```
Points
```

Out[6]:
```
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 [7]:
```
Salary
```

Out[7]:
```
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 [8]:
```
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 [9]:
```
np.reshape(mydata,(4,5))
```

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

In [10]:
```
mydata
```

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

In [11]:
```
MATR1=np.reshape(mydata,(4,5), order= 'c')
MATR1
```

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

In [12]:
```
MATR1
```

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

In [13]:
```
MATR1[3]
```

Out[13]:
```
array([15, 16, 17, 18, 19])
```

In [14]:
```
MATR1[3,4]
```

Out[14]:
```
19
```

In [15]:
```
MATR1[2,-2]
```

Out[15]:
```
13
```

In [16]:
```
MATR1[-4,3]
```

Out[16]:
```
3
```

In [17]:
```
MATR1[-3,-5]
```

Out[17]:
```
5
```

In [18]:
```
MATR1[2:4]
```

Out[18]:
```
array([[10, 11, 12, 13, 14],
       [15, 16, 17, 18, 19]])
```

In [19]:
```
MATR1[-4:-1]
```

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

In [20]:
```
MATR1[::3]
```

Out[20]:
```
array([[ 0,  1,  2,  3,  4],
       [15, 16, 17, 18, 19]])
```

In [21]:
```
MATR1[-3::]
```

Out[21]:
```
array([[ 5,  6,  7,  8,  9],
       [10, 11, 12, 13, 14],
       [15, 16, 17, 18, 19]])
```

In [22]:
```
mydata
```

Out[22]:
```
array([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13, 14, 15, 16,
       17, 18, 19])
```

In [23]:
```
MATR2=np.reshape(mydata,(5,4),order ='F')
MATR2
```

Out[23]:
```
array([[ 0,  5, 10, 15],
       [ 1,  6, 11, 16],
       [ 2,  7, 12, 17],
       [ 3,  8, 13, 18],
       [ 4,  9, 14, 19]])
```

In [24]:
```
MATR2[2,3]
```

Out[24]:
```
17
```

In [25]:
```
MATR2[4]
```

Out[25]:
```
array([ 4,  9, 14, 19])
```

In [26]:
```
MATR2[3,-1]
```

Out[26]:
```
18
```

In [27]:
```
MATR2[-3,1]
```

Out[27]:
```
7
```

In [28]:
```
MATR2[2:3]
```

Out[28]:
```
array([[ 2,  7, 12, 17]])
```

In [29]:
```
MATR2[-3:-1]
```

Out[29]:
```
array([[ 2,  7, 12, 17],
       [ 3,  8, 13, 18]])
```

In [30]:
```
MATR2[-3::-3]
```

Out[30]:
```
array([[ 2,  7, 12, 17]])
```

In [31]:
```
MATR2[::2]
```

Out[31]:
```
array([[ 0,  5, 10, 15],
       [ 2,  7, 12, 17],
       [ 4,  9, 14, 19]])
```

In [32]:
```
MATR2[-3::]
```

Out[32]:
```
array([[ 2,  7, 12, 17],
       [ 3,  8, 13, 18],
       [ 4,  9, 14, 19]])
```

In [33]:
```
MATR2[1::-2]
```

Out[33]:
```
array([[ 1,  6, 11, 16]])
```

In [34]:
```
mydata
```

Out[34]:
```
array([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13, 14, 15, 16,
       17, 18, 19])
```

In [35]:
```
MATR3=np.reshape(mydata,(2,10),order='A')
MATR3
```

Out[35]:
```
array([[ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9],
       [10, 11, 12, 13, 14, 15, 16, 17, 18, 19]])
```

In [36]:
```
MATR3[1]
```

Out[36]:
```
array([10, 11, 12, 13, 14, 15, 16, 17, 18, 19])
```

In [37]:
```
MATR3[-2]
```

Out[37]:
```
array([0, 1, 2, 3, 4, 5, 6, 7, 8, 9])
```

In [38]:
```
MATR3[::-1]
```

Out[38]:
```
array([[10, 11, 12, 13, 14, 15, 16, 17, 18, 19],
       [ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9]])
```

In [39]:
```
MATR3[1::]
```

Out[39]:
```
array([[10, 11, 12, 13, 14, 15, 16, 17, 18, 19]])
```

In [40]:
```
MATR3[1,-5]
```

Out[40]:
```
15
```

In [41]:
```
MATR3[-1,4]
```

Out[41]:
```
14
```

In [42]:
```
MATR3[0:-1]
```

Out[42]:
```
array([[0, 1, 2, 3, 4, 5, 6, 7, 8, 9]])
```

In [43]:
```
MATR3[0::1]
```

Out[43]:
```
array([[ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9],
       [10, 11, 12, 13, 14, 15, 16, 17, 18, 19]])
```

In [44]:
```
MATR1 #C SHAPED
```

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

In [45]:
```
MATR2 #F SHAPED
```

Out[45]:
```
array([[ 0,  5, 10, 15],
       [ 1,  6, 11, 16],
       [ 2,  7, 12, 17],
       [ 3,  8, 13, 18],
       [ 4,  9, 14, 19]])
```

In [46]:
```
MATR3 #A SHAPED
```

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

In [47]:
```
a1 = ['welcome','to','datascience']
a2 = ['required','hard','work']
a3 = [1,2,3]
```

In [48]:
```
[a1,a2,a3]
```

Out[48]:
```
[['welcome', 'to', 'datascience'], ['required', 'hard', 'work'], [1, 2, 3]]
```

In [49]:
```
np.array([a1,a2,a3])
```

Out[49]:
```
array([['welcome', 'to', 'datascience'],
       ['required', 'hard', 'work'],
       ['1', '2', '3']], dtype='<U11')
```

In [50]:
```
[a1,
a2,
a3]
```

Out[50]:
```
[['welcome', 'to', 'datascience'], ['required', 'hard', 'work'], [1, 2, 3]]
```

In [51]:
```
np.array([a1,a2,a3])
```

Out[51]:
```
array([['welcome', 'to', 'datascience'],
       ['required', 'hard', 'work'],
       ['1', '2', '3']], dtype='<U11')
```

In [52]:
```
#DICTIONARY
dict1={'key1':'val1','key2':'val2','key3':'val3'}
```

In [53]:
```
dict1
```

Out[53]:
```
{'key1': 'val1', 'key2': 'val2', 'key3': 'val3'}
```

In [54]:
```
dict1['key2']
```

Out[54]:
```
'val2'
```

In [55]:
```
dict1['key1']
```

Out[55]:
```
'val1'
```

In [56]:
```
dict2={'bnglr':2,'hyd':'we are hear','pune':True}
```

In [57]:
```
dict2
```

Out[57]:
```
{'bnglr': 2, 'hyd': 'we are hear', 'pune': True}
```

In [58]:
```
dict2['hyd']
```

Out[58]:
```
'we are hear'
```

In [59]:
```
dict2['bnglr']
```

Out[59]:
```
2
```

In [60]:
```
dict2 = {'bnglr':2,'hyd':'we are hear', 'pune':False}
```

In [61]:
```
dict2
```

Out[61]:
```
{'bnglr': 2, 'hyd': 'we are hear', 'pune': False}
```

In [62]:
```
dict2['pune']
```

Out[62]: False

In [63]:
```
dict3= {'Germany':'I have been here','France':3,'Spain': True}
```

In [64]:
```
dict3
```

Out[64]: {'Germany': 'I have been here', 'France': 3, 'Spain': True}

In [65]:
```
dict3['Spain']
```

Out[65]: True

In [66]:
```
dict3= {'Germany':'I have been here','France':3,'Spain': False}
```

In [67]:
```
dict3
```

Out[67]: {'Germany': 'I have been here', 'France': 3, 'Spain': False}

In [68]:
```
dict3['Germany']
```

Out[68]: 'I have been here'

In [69]:
```
dict3['Spain']
```

Out[69]: False

In [70]:
```
Salary
```

Out[70]:
```
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 [71]:
```
Salary[2]
```

Out[71]:
```
array([ 4621800,  5828090, 13041250, 14410581, 15779912, 14500000,
       16022500, 17545000, 19067500, 20644400])
```

In [72]:
```
Salary[Pdict['Rahul']][Sdict['2015']]
```

Out[72]: 16324500

In [73]:
```
Salary[3]
```

Out[73]:
```
array([ 3713640,  4694041, 13041250, 14410581, 15779912, 17149243,
       18518574, 19450000, 22407474, 22458000])
```

In [74]:
```
Pdict['Sachin']
```

Out[74]: 0

In [75]:
```
Games[Pdict['Sky']][Sdict['2019']]
```

Out[75]: 62

In [76]:
```
Pdict['Samson']
```

Out[76]: 6

In [77]:
```
Points[Pdict['Samson']][Sdict['2015']]
```

Out[77]: 1268

In [78]:
```
Games[4]
```

Out[78]:
```
array([82, 82, 82, 79, 82, 78, 54, 76, 71, 41])
```

In [79]:
```
Salary[0:3]
```

Out[79]:
```
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]])
```

In [80]:
```
Salary[0,8]
```

Out[80]:
```
30453805
```

In [81]:
```
Salary[4:-2]
```

Out[81]:
```
array([[ 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]])
```

In [82]:
```
Salary[-7,6]
```

Out[82]:
```
18518574
```

In [83]:
```
Salary[5::8]
```

Out[83]:
```
array([[ 3348000,  4235220, 12455000, 14410581, 15779912, 14500000,
        16022500, 17545000, 19067500, 20644400]])
```

In [84]:
```
Salary[3::]
```

Out[84]:
```
array([[ 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 [85]:
```
Salary[::-5]
```

Out[85]:
```
array([[ 3031920,  3841443, 13041250, 14410581, 15779912, 14200000,
        15691000, 17182000, 18673000, 15000000],
       [ 4493160,  4806720,  6061274, 13758000, 15202590, 16647180,
        18091770, 19536360, 20513178, 21436271]])
```

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 [87]:
```
Games[4]
```

Out[87]:
```
array([82, 82, 82, 79, 82, 78, 54, 76, 71, 41])
```

In [88]:
```
Games[2:4]
```

Out[88]:
```
array([[79, 78, 75, 81, 76, 79, 62, 76, 77, 69],
       [80, 65, 77, 66, 69, 77, 55, 67, 77, 40]])
```

In [89]:
```
Games[4,6]
```

Out[89]:
```
54
```

In [90]:
```
Games[-4]
```

Out[90]:
```
array([78, 64, 80, 78, 45, 80, 60, 70, 62, 82])
```

In [91]:
```
Games[::4]
```

Out[91]:
```
array([[80, 77, 82, 82, 73, 82, 58, 78,  6, 35],
       [82, 82, 82, 79, 82, 78, 54, 76, 71, 41],
       [40, 40, 40, 81, 78, 81, 39,  0, 10, 51]])
```

In [92]:
```
Games[2::]
```

Out[92]:
```
array([[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 [93]:
```
Games[-7:7]
```

Out[93]:
```
array([[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]])
```

In [94]:
```
Games[7,-2]
```

Out[94]:
```
81
```

In [95]:
```
Games[7::1]
```

Out[95]:
```
array([[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 [96]:
```
Salary
```

Out[96]:
```
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 [97]:
```
Games
```

Out[97]:
```
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 [98]:
```
Salary[Pdict['Kohli']][Sdict['2015']]
```

Out[98]:
```
5546160
```

In [99]:
```
import warnings
warnings.filterwarnings('ignore')
```

In [100…
```
Salary/Games
```

Out[100…
```
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]])
```

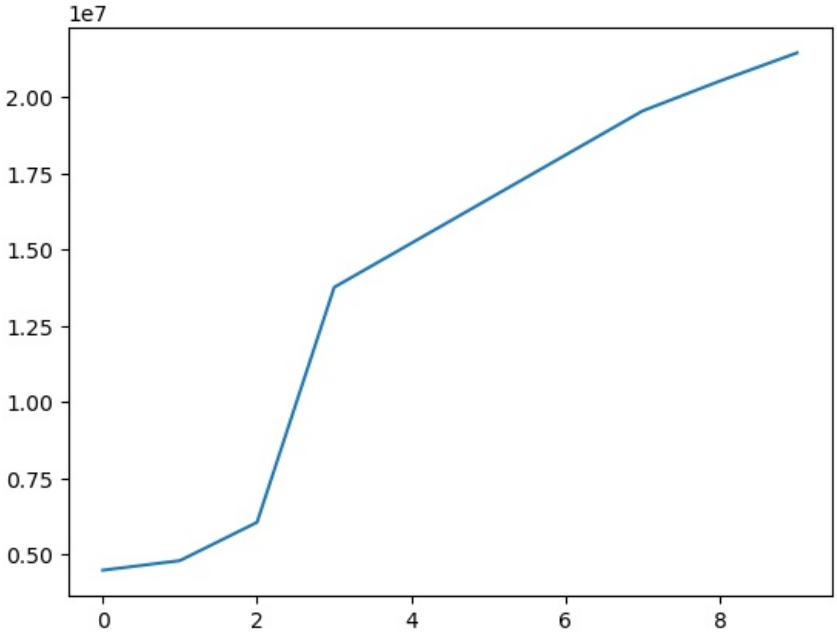
In [101…
```
np.round(Salary/Games)
```

Out[101…
```
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 [102…
```
import numpy as np
import matplotlib.pyplot as plt
%matplotlib inline
```

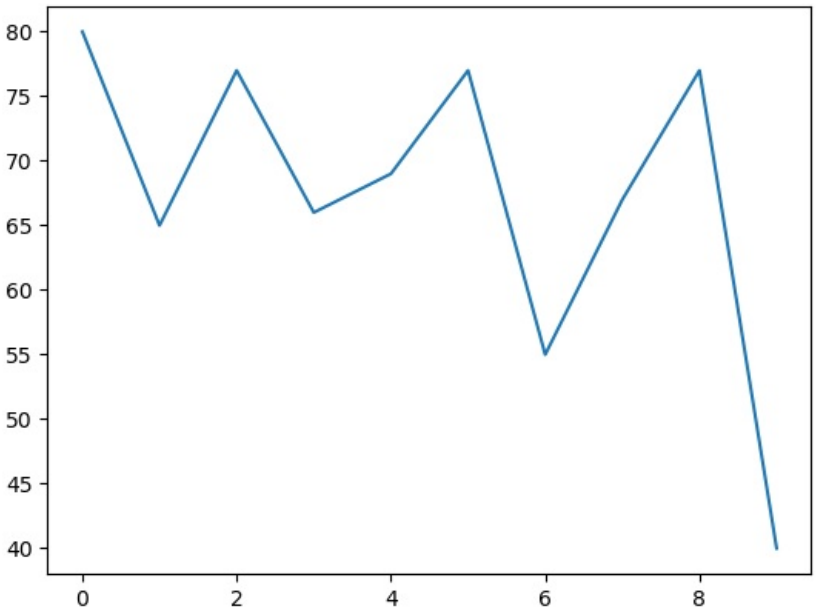
In [103…
```
plt.plot(Salary[4])
```

Out[103…
```
[<matplotlib.lines.Line2D at 0x2c5b42452e0>]
```



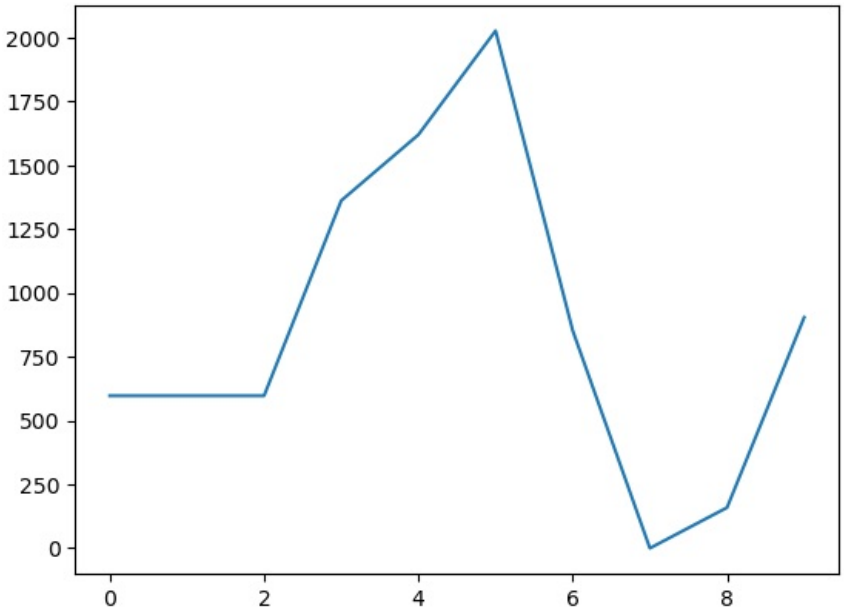
In [104…
```
plt.plot(Games[3])
```

Out[104… [<matplotlib.lines.Line2D at 0x2c5b4349790>]



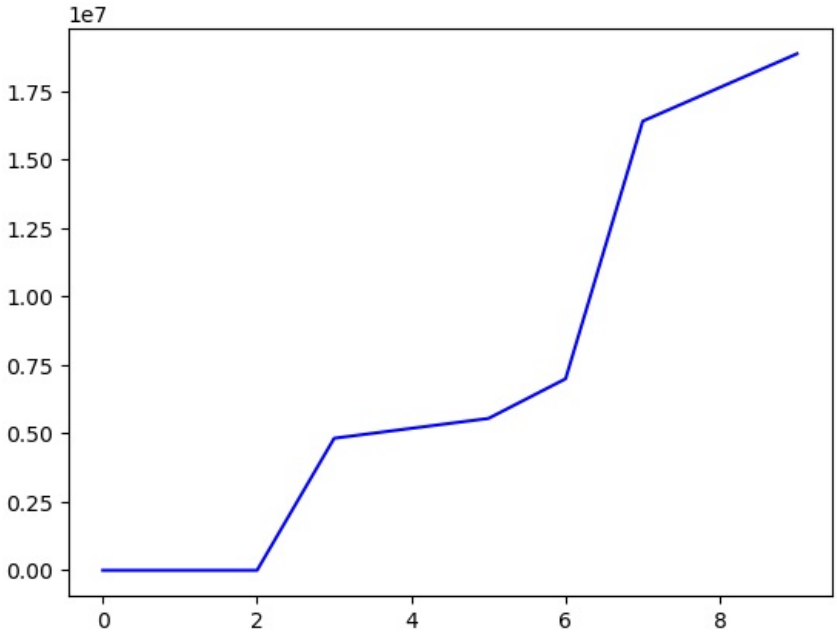
In [105…
```
plt.plot(Points[8])
```

Out[105… [<matplotlib.lines.Line2D at 0x2c5b4518440>]



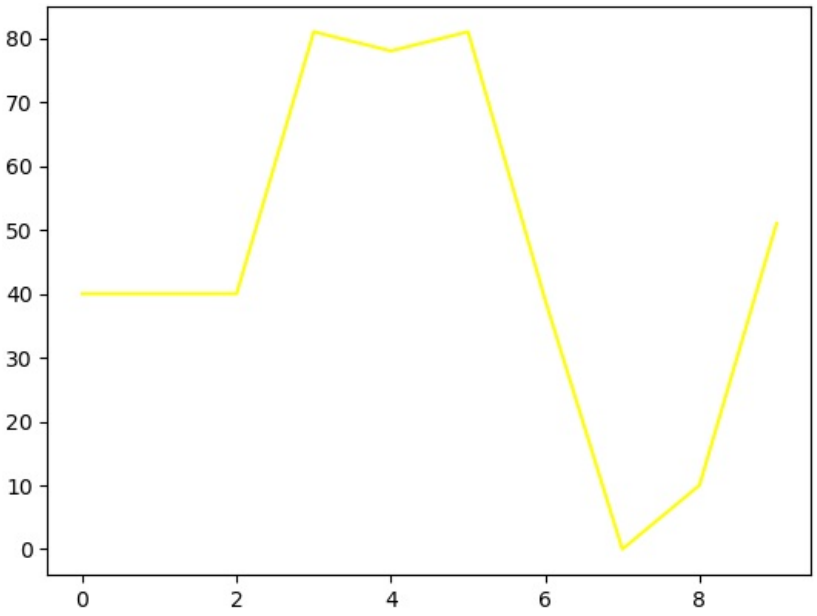
In [106…
```
plt.plot(Salary[8], c = 'blue')
```

Out[106…
```
[<matplotlib.lines.Line2D at 0x2c5b456f170>]
```



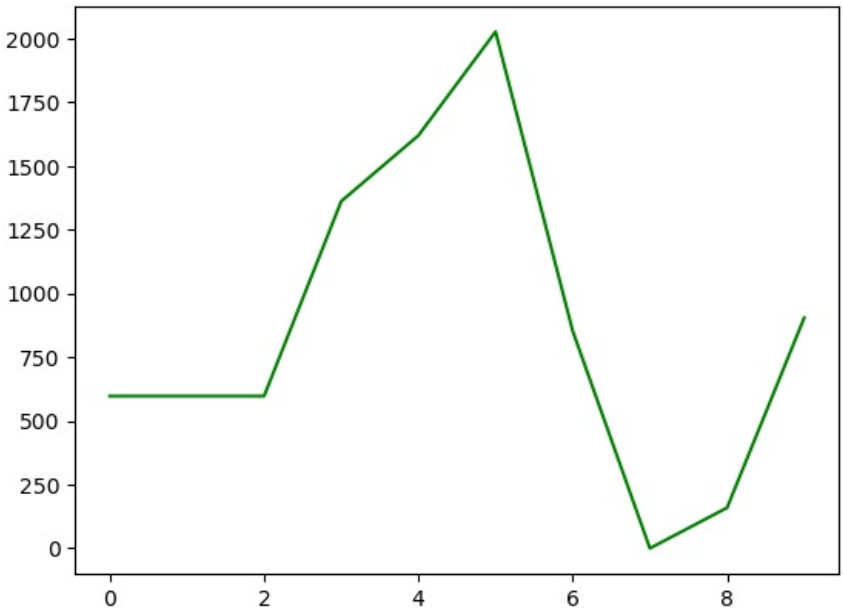
In [107…
```
plt.plot(Games[8], c = 'yellow')
```

Out[107…
```
[<matplotlib.lines.Line2D at 0x2c5b45fc4d0>]
```



In [108…
```
plt.plot(Points[8], c = 'green')
```

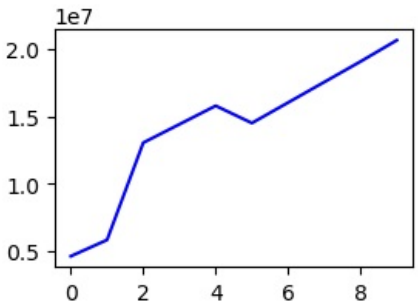
Out[108…
```
[<matplotlib.lines.Line2D at 0x2c5b465d8e0>]
```



In [109…
```
%matplotlib inline
plt.rcParams['figure.figsize'] = 3,2
```

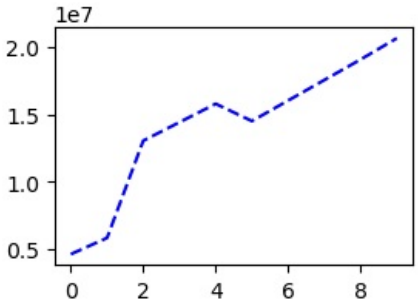
In [110…
```
plt.plot(Salary[2], c = 'Blue', ls = 'solid')
```

Out[110…
```
[<matplotlib.lines.Line2D at 0x2c5b568f260>]
```



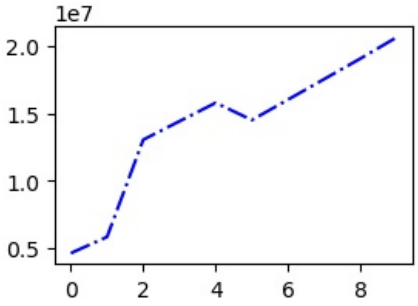
In [111…
```
plt.plot(Salary[2], c = 'Blue', ls = 'dashed')
```

Out[111… [<matplotlib.lines.Line2D at 0x2c5b5705a90>]



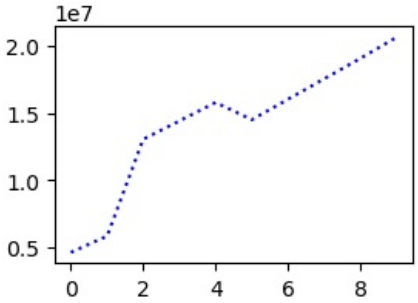
In [112…
```
plt.plot(Salary[2], c = 'Blue', ls = 'dashdot')
```

Out[112… [<matplotlib.lines.Line2D at 0x2c5b5770320>]



In [113…
```
plt.plot(Salary[2], c = 'Blue', ls = 'dotted')
```

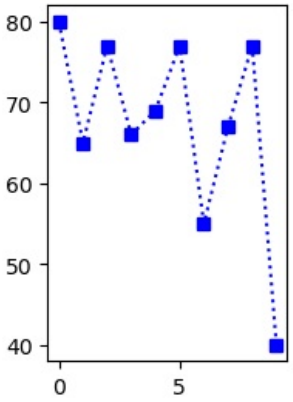
Out[113… [<matplotlib.lines.Line2D at 0x2c5b43928a0>]



In [114…
```
%matplotlib inline
plt.rcParams['figure.figsize'] = 2,3
```

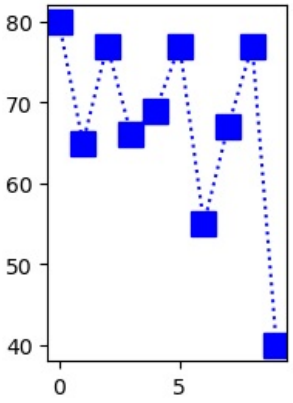
In [115…
```
plt.plot(Games[3], c ='Blue', ls = 'dotted', marker ='s')
```

Out[115… [<matplotlib.lines.Line2D at 0x2c5b4410a40>]



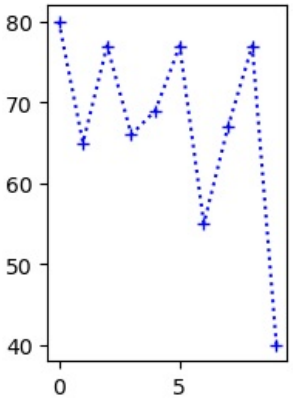
In [116…
```
plt.plot(Games[3], c ='Blue', ls = 'dotted', marker ='s', ms = '12')
```

Out[116… [<matplotlib.lines.Line2D at 0x2c5b4455e20>]



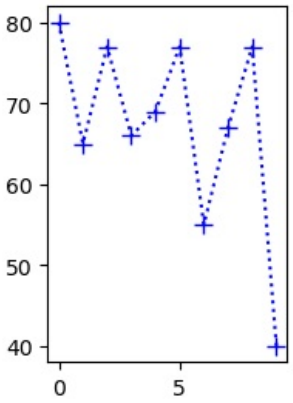
In [117…
```
plt.plot(Games[3], c ='Blue', ls = 'dotted', marker ='+')
```

Out[117…
```
[<matplotlib.lines.Line2D at 0x2c5b57c3050>]
```



In [118…
```
plt.plot(Games[3], c ='Blue', ls = 'dotted', marker ='+', ms = '8')
```

Out[118…
```
[<matplotlib.lines.Line2D at 0x2c5b5840230>]
```



In [119…
```
list(range(0,10))
```

Out[119…
```
[0, 1, 2, 3, 4, 5, 6, 7, 8, 9]
```

In [120…
```
Sdict
```

Out[120…
```
{'2010': 0,
 '2011': 1,
 '2012': 2,
 '2013': 3,
 '2014': 4,
 '2015': 5,
 '2016': 6,
 '2017': 7,
 '2018': 8,
 '2019': 9}
```

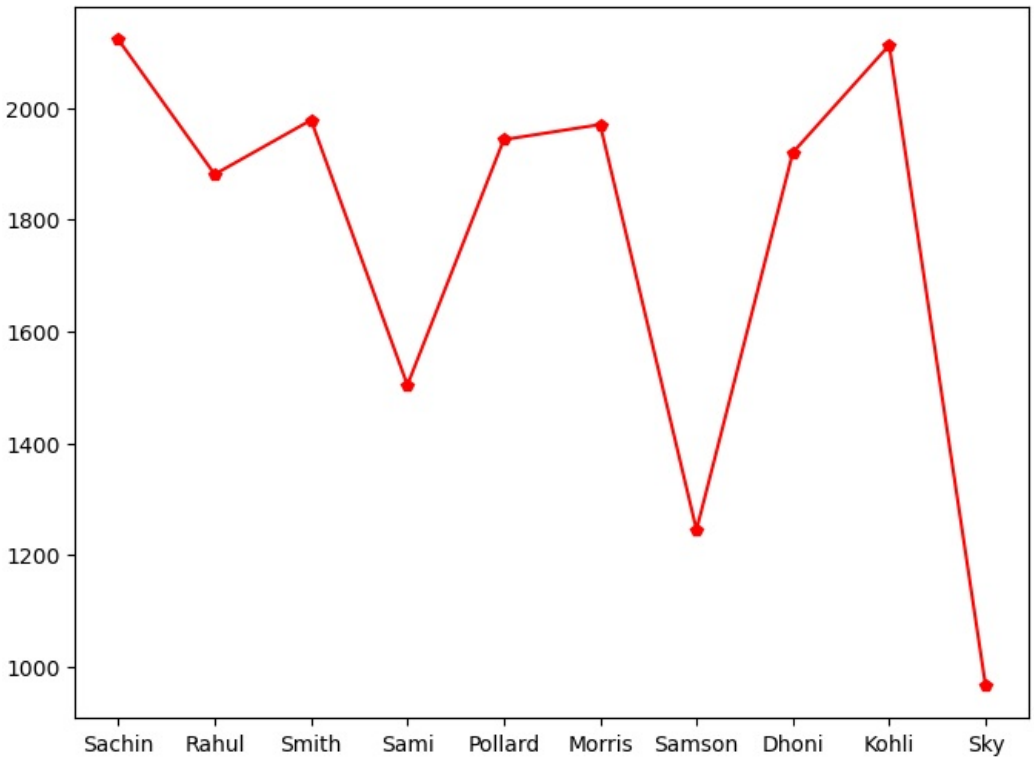
In [121…
```
Pdict
```

Out[121…
```
{'Sachin': 0,
 'Rahul': 1,
 'Smith': 2,
 'Sami': 3,
 'Pollard': 4,
 'Morris': 5,
 'Samson': 6,
 'Dhoni': 7,
 'Kohli': 8,
 'Sky': 9}
```

In [122…
```
%matplotlib inline
plt.rcParams['figure.figsize'] = 8,6
```

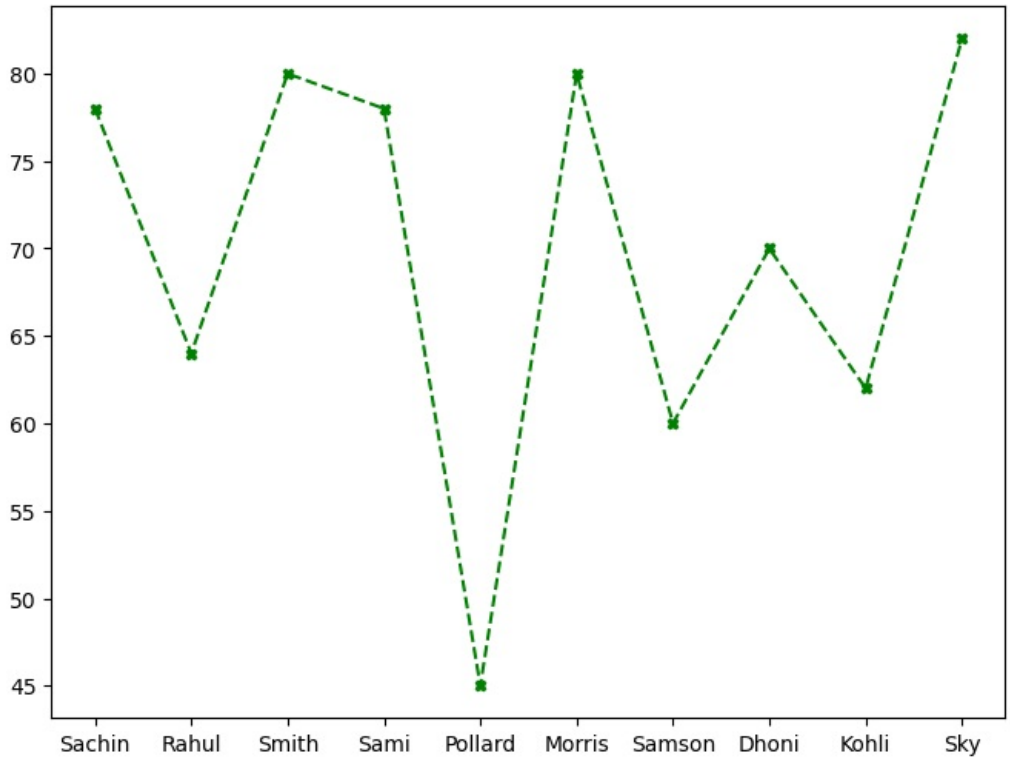
In [123…
```
plt.plot(Points[3], c = 'red', ls = 'solid', marker ='p', ms = '6')
plt.xticks(list(range(0,10)), Players)
```

Out[123…
```
([<matplotlib.axis.XTick at 0x2c5b585a7e0>,
  <matplotlib.axis.XTick at 0x2c5b585a7b0>,
  <matplotlib.axis.XTick at 0x2c5b58597f0>,
  <matplotlib.axis.XTick at 0x2c5b587e390>,
  <matplotlib.axis.XTick at 0x2c5b587ecc0>,
  <matplotlib.axis.XTick at 0x2c5b587f5f0>,
  <matplotlib.axis.XTick at 0x2c5b587ff80>,
  <matplotlib.axis.XTick at 0x2c5b58b0950>,
  <matplotlib.axis.XTick at 0x2c5b587e660>,
  <matplotlib.axis.XTick at 0x2c5b58b0fb0>],
 [Text(0, 0, 'Sachin'),
  Text(1, 0, 'Rahul'),
  Text(2, 0, 'Smith'),
  Text(3, 0, 'Sami'),
  Text(4, 0, 'Pollard'),
  Text(5, 0, 'Morris'),
  Text(6, 0, 'Samson'),
  Text(7, 0, 'Dhoni'),
  Text(8, 0, 'Kohli'),
  Text(9, 0, 'Sky')])
```



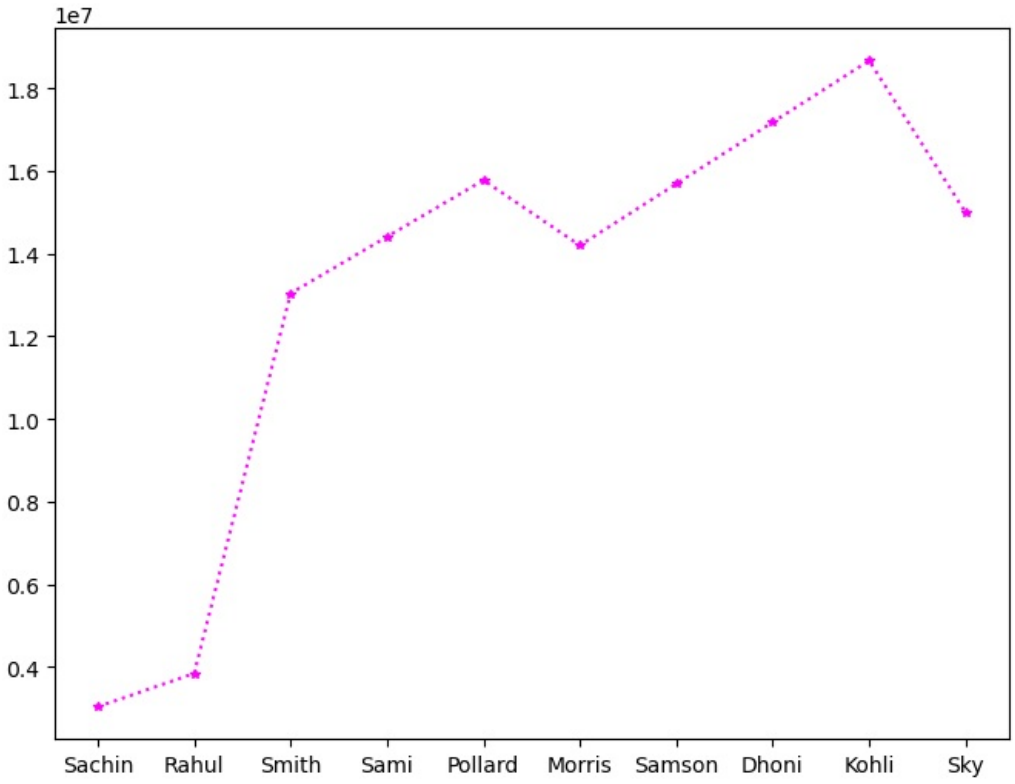
In [124…
```
plt.plot(Games[6], c ='green', ls='dashed', marker='X', ms='5')
plt.xticks(list(range(0,10)),Players)
```

Out[124… ([<matplotlib.axis.XTick at 0x2c5b58b2ff0>,
<matplotlib.axis.XTick at 0x2c5b58d3f20>,
<matplotlib.axis.XTick at 0x2c5b580f380>,
<matplotlib.axis.XTick at 0x2c5b58efcb0>,
<matplotlib.axis.XTick at 0x2c5b5918680>,
<matplotlib.axis.XTick at 0x2c5b5919010>,
<matplotlib.axis.XTick at 0x2c5b59199a0>,
<matplotlib.axis.XTick at 0x2c5b5918830>,
<matplotlib.axis.XTick at 0x2c5b591a210>,
<matplotlib.axis.XTick at 0x2c5b591aba0>],
[Text(0, 0, 'Sachin'),
Text(1, 0, 'Rahul'),
Text(2, 0, 'Smith'),
Text(3, 0, 'Sami'),
Text(4, 0, 'Pollard'),
Text(5, 0, 'Morris'),
Text(6, 0, 'Samson'),
Text(7, 0, 'Dhoni'),
Text(8, 0, 'Kohli'),
Text(9, 0, 'Sky')])



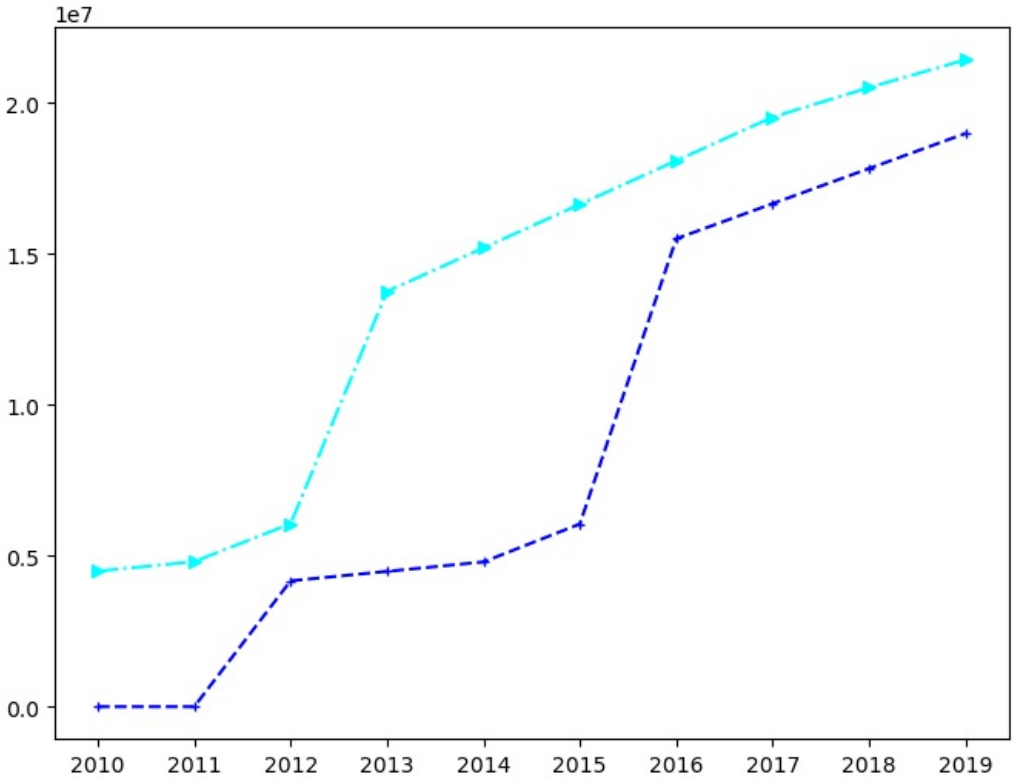
In [125…
```
plt.plot(Salary[9], c='magenta', ls='dotted', marker='*', ms='4')
plt.xticks(list(range(0,10)), Players)
```

Out[125… ([<matplotlib.axis.XTick at 0x2c5b594ca10>,
<matplotlib.axis.XTick at 0x2c5b5858b60>,
<matplotlib.axis.XTick at 0x2c5b58b1370>,
<matplotlib.axis.XTick at 0x2c5b5975d90>,
<matplotlib.axis.XTick at 0x2c5b59766f0>,
<matplotlib.axis.XTick at 0x2c5b5977050>,
<matplotlib.axis.XTick at 0x2c5b59779b0>,
<matplotlib.axis.XTick at 0x2c5b599c2f0>,
<matplotlib.axis.XTick at 0x2c5b5977320>,
<matplotlib.axis.XTick at 0x2c5b599cb90>],
[Text(0, 0, 'Sachin'),
Text(1, 0, 'Rahul'),
Text(2, 0, 'Smith'),
Text(3, 0, 'Sami'),
Text(4, 0, 'Pollard'),
Text(5, 0, 'Morris'),
Text(6, 0, 'Samson'),
Text(7, 0, 'Dhoni'),
Text(8, 0, 'Kohli'),
Text(9, 0, 'Sky')])



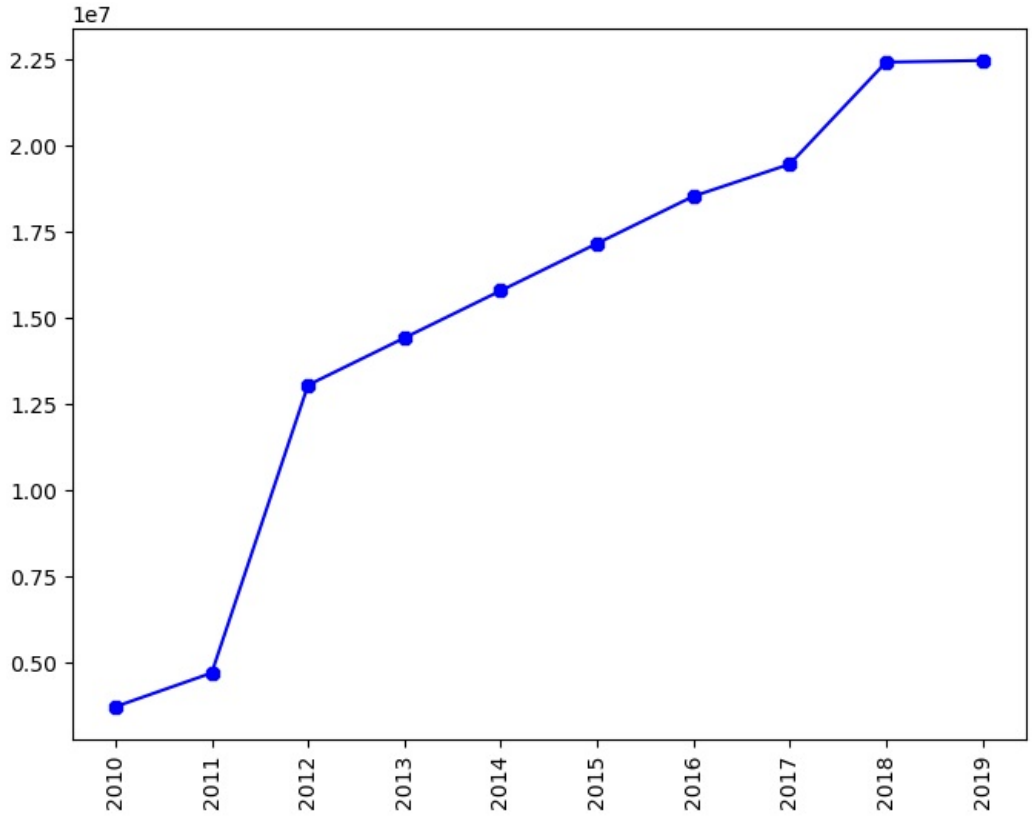
In [126…
```
plt.plot(Salary[4],c='cyan',ls='dashdot',marker='>',ms='6')
plt.plot(Salary[7],c='blue',ls='dashed',marker='+',ms='4')
plt.xticks(list(range(0,10)), Seasons)
```

Out[126…
```
([<matplotlib.axis.XTick at 0x2c5b5919760>,
  <matplotlib.axis.XTick at 0x2c5b59d0410>,
  <matplotlib.axis.XTick at 0x2c5b59b7980>,
  <matplotlib.axis.XTick at 0x2c5b59fd250>,
  <matplotlib.axis.XTick at 0x2c5b59fd8b0>,
  <matplotlib.axis.XTick at 0x2c5b59fe240>,
  <matplotlib.axis.XTick at 0x2c5b59febd0>,
  <matplotlib.axis.XTick at 0x2c5b59ff500>,
  <matplotlib.axis.XTick at 0x2c5b59ffef0>,
  <matplotlib.axis.XTick at 0x2c5b59fe5d0>],
 [Text(0, 0, '2010'),
  Text(1, 0, '2011'),
  Text(2, 0, '2012'),
  Text(3, 0, '2013'),
  Text(4, 0, '2014'),
  Text(5, 0, '2015'),
  Text(6, 0, '2016'),
  Text(7, 0, '2017'),
  Text(8, 0, '2018'),
  Text(9, 0, '2019')])
```



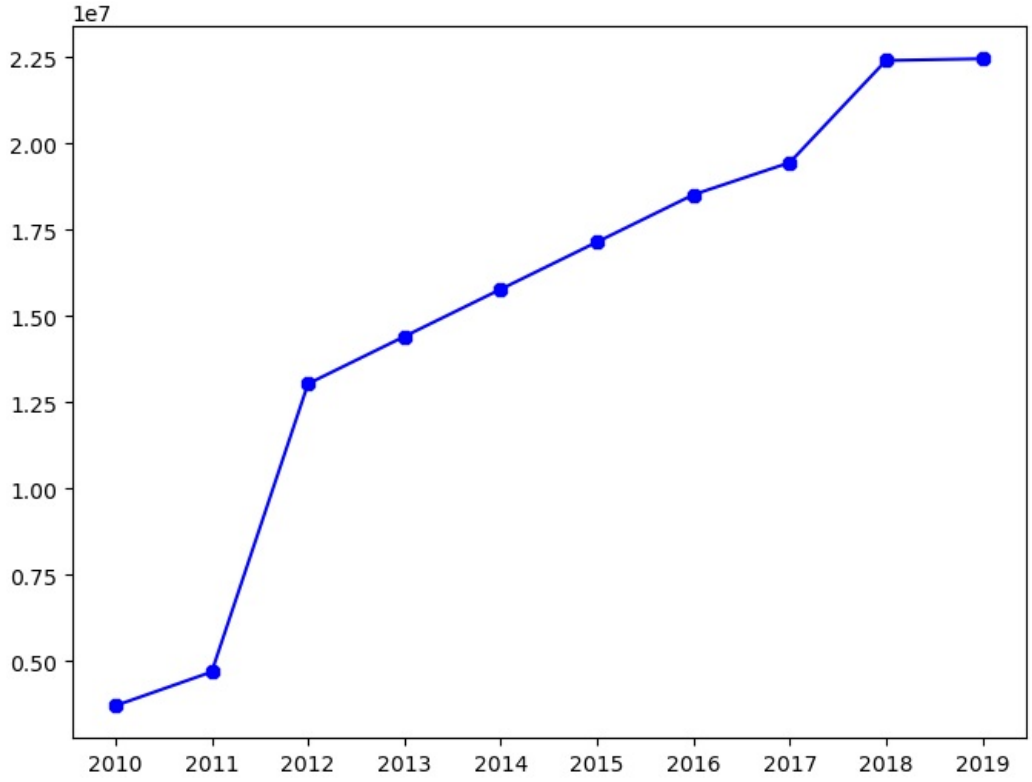
In [127…
```
plt.plot(Salary[3],c='blue',ls='solid',marker='8',ms='6')
plt.xticks(list(range(0,10)),Seasons,rotation='vertical')
```

Out[127…
```
([<matplotlib.axis.XTick at 0x2c5b5a3db50>,
  <matplotlib.axis.XTick at 0x2c5b5a3db20>,
  <matplotlib.axis.XTick at 0x2c5b594d5e0>,
  <matplotlib.axis.XTick at 0x2c5b5a719a0>,
  <matplotlib.axis.XTick at 0x2c5b5a71f70>,
  <matplotlib.axis.XTick at 0x2c5b5a728d0>,
  <matplotlib.axis.XTick at 0x2c5b5a73170>,
  <matplotlib.axis.XTick at 0x2c5b5a73b00>,
  <matplotlib.axis.XTick at 0x2c5b5e30500>,
  <matplotlib.axis.XTick at 0x2c5b5a72b40>],
 [Text(0, 0, '2010'),
  Text(1, 0, '2011'),
  Text(2, 0, '2012'),
  Text(3, 0, '2013'),
  Text(4, 0, '2014'),
  Text(5, 0, '2015'),
  Text(6, 0, '2016'),
  Text(7, 0, '2017'),
  Text(8, 0, '2018'),
  Text(9, 0, '2019')])
```



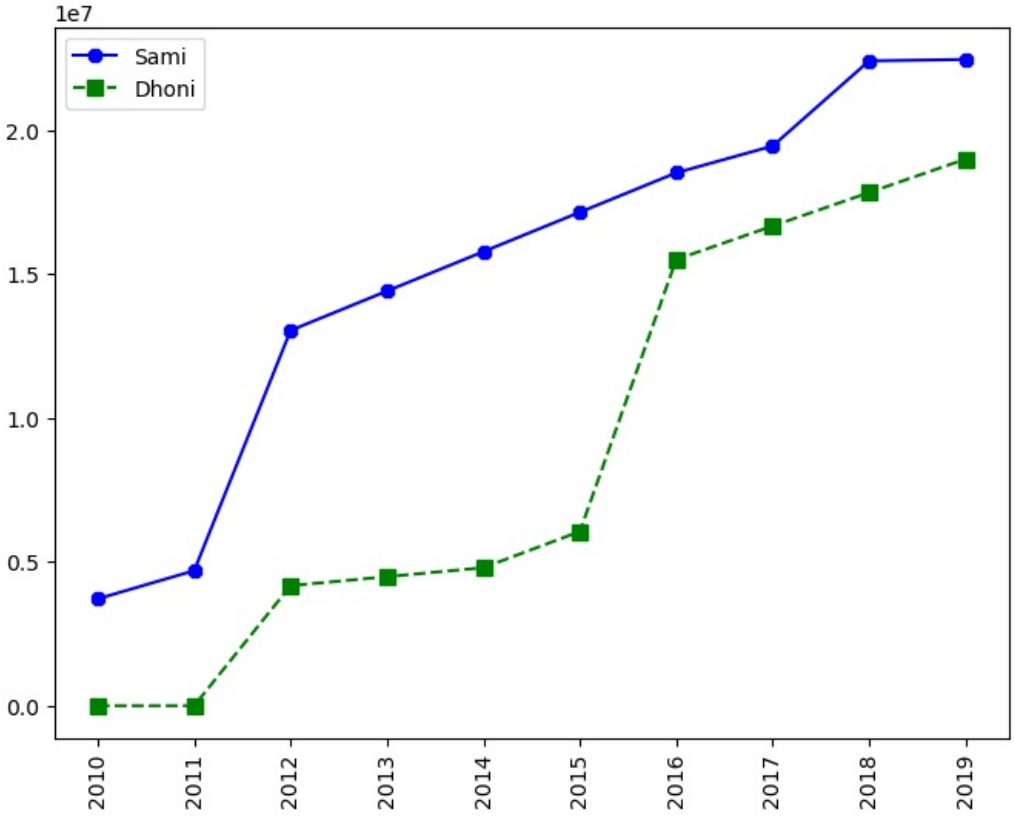
In [128…
```
plt.plot(Salary[3],c='blue',ls='solid',marker='8',ms='6')
plt.xticks(list(range(0,10)),Seasons,rotation='horizontal')
```

Out[128…
```
([<matplotlib.axis.XTick at 0x2c5b5a70e60>,
  <matplotlib.axis.XTick at 0x2c5b58b0b60>,
  <matplotlib.axis.XTick at 0x2c5b5e4bb00>,
  <matplotlib.axis.XTick at 0x2c5b5e4bfe0>,
  <matplotlib.axis.XTick at 0x2c5b5ea0fb0>,
  <matplotlib.axis.XTick at 0x2c5b5ea0a10>,
  <matplotlib.axis.XTick at 0x2c5b5ea1c40>,
  <matplotlib.axis.XTick at 0x2c5b5ea2540>,
  <matplotlib.axis.XTick at 0x2c5b5ea2ea0>,
  <matplotlib.axis.XTick at 0x2c5b5ea37d0>],
 [Text(0, 0, '2010'),
  Text(1, 0, '2011'),
  Text(2, 0, '2012'),
  Text(3, 0, '2013'),
  Text(4, 0, '2014'),
  Text(5, 0, '2015'),
  Text(6, 0, '2016'),
  Text(7, 0, '2017'),
  Text(8, 0, '2018'),
  Text(9, 0, '2019')])
```



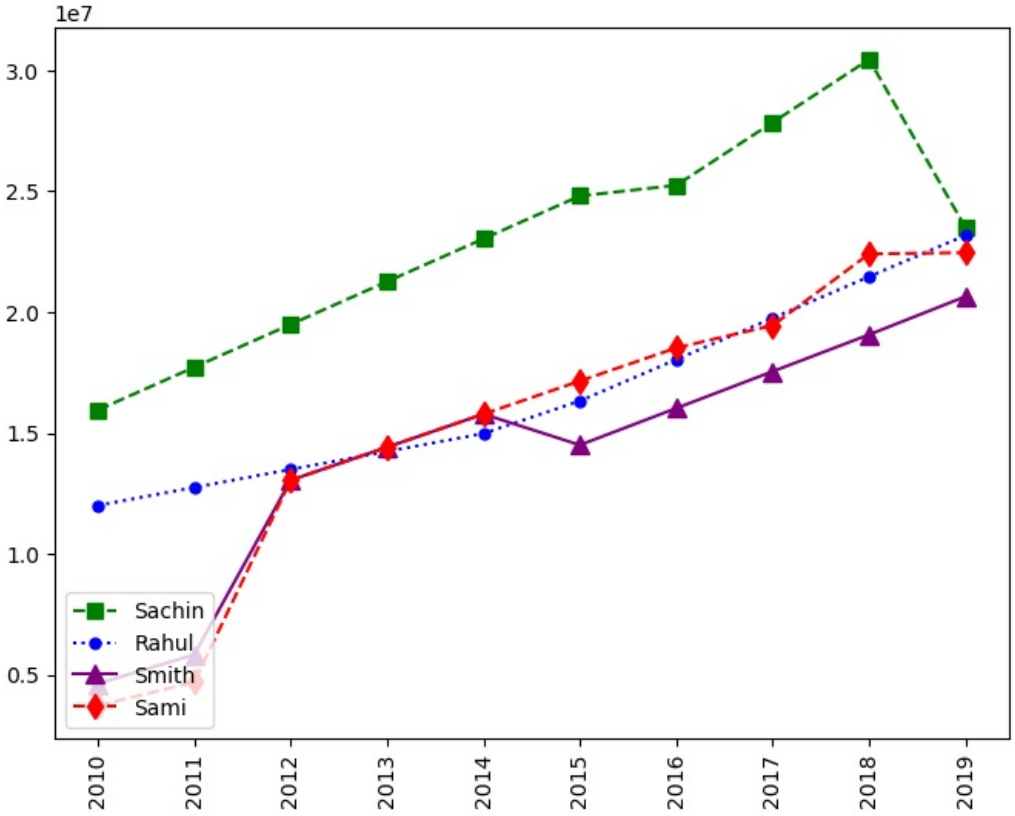
In [129…
```
plt.plot(Salary[3],c='blue',ls='solid',marker='8',ms='6', label= Players[3])
plt.plot(Salary[7],c='green',ls='dashed',marker='s',ms='7',label= Players[7])
plt.legend()
plt.xticks(list(range(0,10)),Seasons,rotation='vertical')
```

Out[129…
```
([<matplotlib.axis.XTick at 0x2c5b5ed62d0>,
  <matplotlib.axis.XTick at 0x2c5b5ed6bd0>,
  <matplotlib.axis.XTick at 0x2c5b585ac60>,
  <matplotlib.axis.XTick at 0x2c5b5ed5280>,
  <matplotlib.axis.XTick at 0x2c5b5efb3b0>,
  <matplotlib.axis.XTick at 0x2c5b5efbd40>,
  <matplotlib.axis.XTick at 0x2c5b62dc710>,
  <matplotlib.axis.XTick at 0x2c5b62dd010>,
  <matplotlib.axis.XTick at 0x2c5b5efaff0>,
  <matplotlib.axis.XTick at 0x2c5b62dd730>],
 [Text(0, 0, '2010'),
  Text(1, 0, '2011'),
  Text(2, 0, '2012'),
  Text(3, 0, '2013'),
  Text(4, 0, '2014'),
  Text(5, 0, '2015'),
  Text(6, 0, '2016'),
  Text(7, 0, '2017'),
  Text(8, 0, '2018'),
  Text(9, 0, '2019')])
```



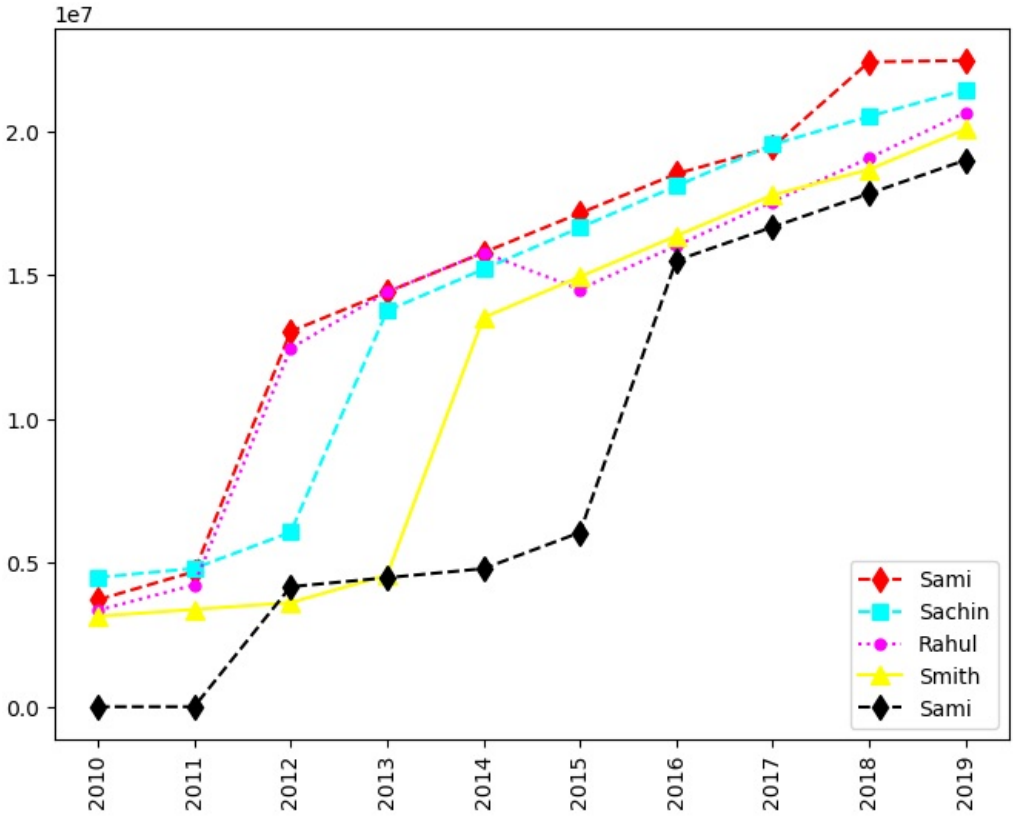
In [130…
```
plt.plot(Salary[0], c='Green', ls = '--', marker = 's', ms = 7, label = Players[0])
plt.plot(Salary[1], c='Blue', ls = ':', marker = 'o', ms = 5, label = Players[1])
plt.plot(Salary[2], c='purple', ls = '-', marker = '^', ms = 8, label = Players[2])
plt.plot(Salary[3], c='Red', ls = '--', marker = 'd', ms = 8, label = Players[3])
plt.legend(loc='lower left')
plt.xticks(list(range(0,10)), Seasons,rotation='vertical')
```

Out[130…
```
([<matplotlib.axis.XTick at 0x2c5b5e4ba70>,
  <matplotlib.axis.XTick at 0x2c5b5a25af0>,
  <matplotlib.axis.XTick at 0x2c5b62dff20>,
  <matplotlib.axis.XTick at 0x2c5b6351bb0>,
  <matplotlib.axis.XTick at 0x2c5b63524e0>,
  <matplotlib.axis.XTick at 0x2c5b6352ea0>,
  <matplotlib.axis.XTick at 0x2c5b63526f0>,
  <matplotlib.axis.XTick at 0x2c5b6353980>,
  <matplotlib.axis.XTick at 0x2c5b636c3b0>,
  <matplotlib.axis.XTick at 0x2c5b636cd10>],
 [Text(0, 0, '2010'),
  Text(1, 0, '2011'),
  Text(2, 0, '2012'),
  Text(3, 0, '2013'),
  Text(4, 0, '2014'),
  Text(5, 0, '2015'),
  Text(6, 0, '2016'),
  Text(7, 0, '2017'),
  Text(8, 0, '2018'),
  Text(9, 0, '2019')])
```



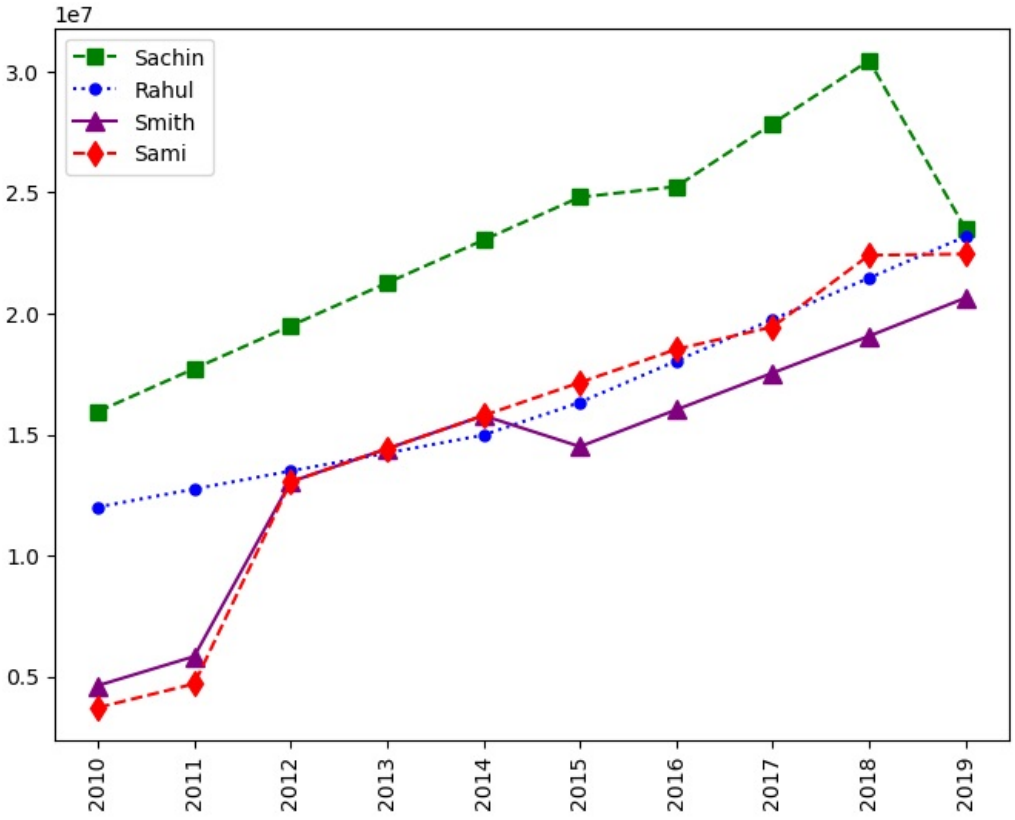
In [131…
```
plt.plot(Salary[3], c='red', ls = '--', marker = 'd', ms = 8, label = Players[3])
plt.plot(Salary[4], c='cyan', ls = '--', marker = 's', ms = 7, label = Players[0])
plt.plot(Salary[5], c='magenta', ls = ':', marker = 'o', ms = 5, label = Players[1])
plt.plot(Salary[6], c='yellow', ls = '-', marker = '^', ms = 8, label = Players[2])
plt.plot(Salary[7], c='black', ls = '--', marker = 'd', ms = 8, label = Players[3])
plt.legend(loc='lower right')
plt.xticks(list(range(0,10)), Seasons,rotation='vertical')
```

Out[131…
```
([<matplotlib.axis.XTick at 0x2c5b638cec0>,
  <matplotlib.axis.XTick at 0x2c5b638e690>,
  <matplotlib.axis.XTick at 0x2c5b59b7230>,
  <matplotlib.axis.XTick at 0x2c5b67a0c80>,
  <matplotlib.axis.XTick at 0x2c5b67a1430>,
  <matplotlib.axis.XTick at 0x2c5b67a1c10>,
  <matplotlib.axis.XTick at 0x2c5b638df40>,
  <matplotlib.axis.XTick at 0x2c5b67a1a00>,
  <matplotlib.axis.XTick at 0x2c5b67a29f0>,
  <matplotlib.axis.XTick at 0x2c5b67a3260>],
 [Text(0, 0, '2010'),
  Text(1, 0, '2011'),
  Text(2, 0, '2012'),
  Text(3, 0, '2013'),
  Text(4, 0, '2014'),
  Text(5, 0, '2015'),
  Text(6, 0, '2016'),
  Text(7, 0, '2017'),
  Text(8, 0, '2018'),
  Text(9, 0, '2019')])
```



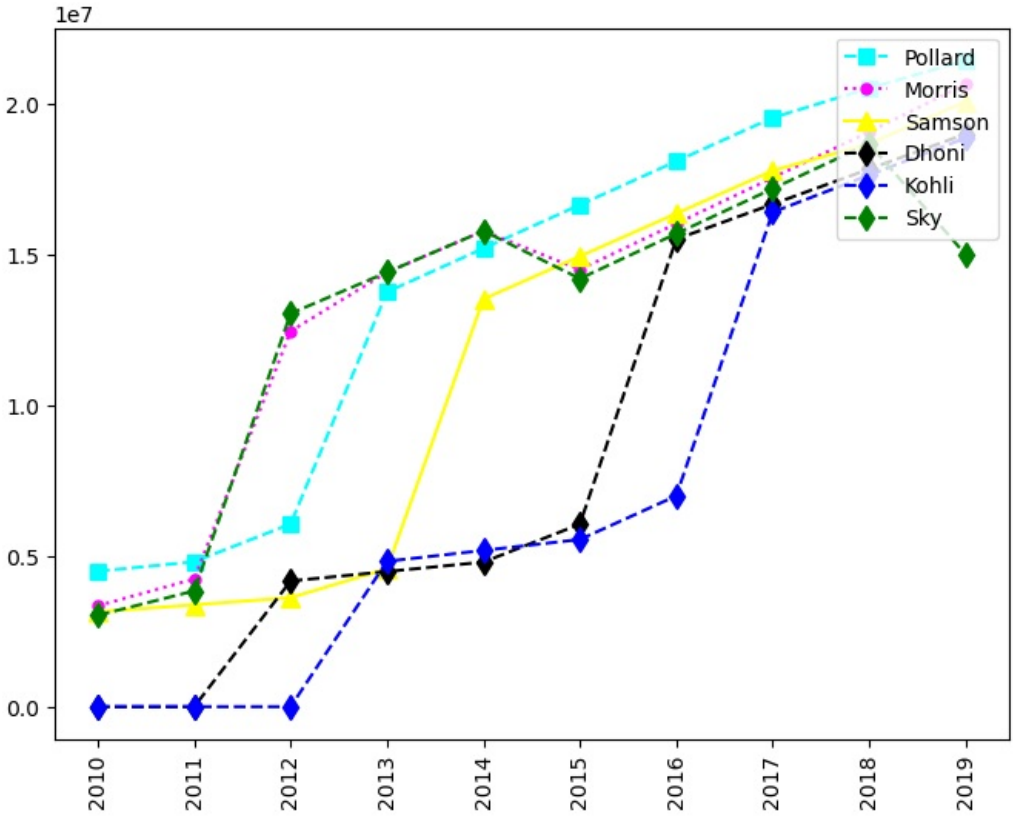
In [132…
```
plt.plot(Salary[0], c='Green', ls = '--', marker = 's', ms = 7, label = Players[0])
plt.plot(Salary[1], c='Blue', ls = ':', marker = 'o', ms = 5, label = Players[1])
plt.plot(Salary[2], c='purple', ls = '-', marker = '^', ms = 8, label = Players[2])
plt.plot(Salary[3], c='Red', ls = '--', marker = 'd', ms = 8, label = Players[3])
plt.legend(loc='upper left')
plt.xticks(list(range(0,10)), Seasons,rotation='vertical')
```

Out[132…
```
([<matplotlib.axis.XTick at 0x2c5b5ec04d0>,
  <matplotlib.axis.XTick at 0x2c5b67d8b60>,
  <matplotlib.axis.XTick at 0x2c5b638fcb0>,
  <matplotlib.axis.XTick at 0x2c5b6829c10>,
  <matplotlib.axis.XTick at 0x2c5b682a4e0>,
  <matplotlib.axis.XTick at 0x2c5b682ad50>,
  <matplotlib.axis.XTick at 0x2c5b682b4d0>,
  <matplotlib.axis.XTick at 0x2c5b682bb00>,
  <matplotlib.axis.XTick at 0x2c5b682bad0>,
  <matplotlib.axis.XTick at 0x2c5b682a8d0>],
 [Text(0, 0, '2010'),
  Text(1, 0, '2011'),
  Text(2, 0, '2012'),
  Text(3, 0, '2013'),
  Text(4, 0, '2014'),
  Text(5, 0, '2015'),
  Text(6, 0, '2016'),
  Text(7, 0, '2017'),
  Text(8, 0, '2018'),
  Text(9, 0, '2019')])
```



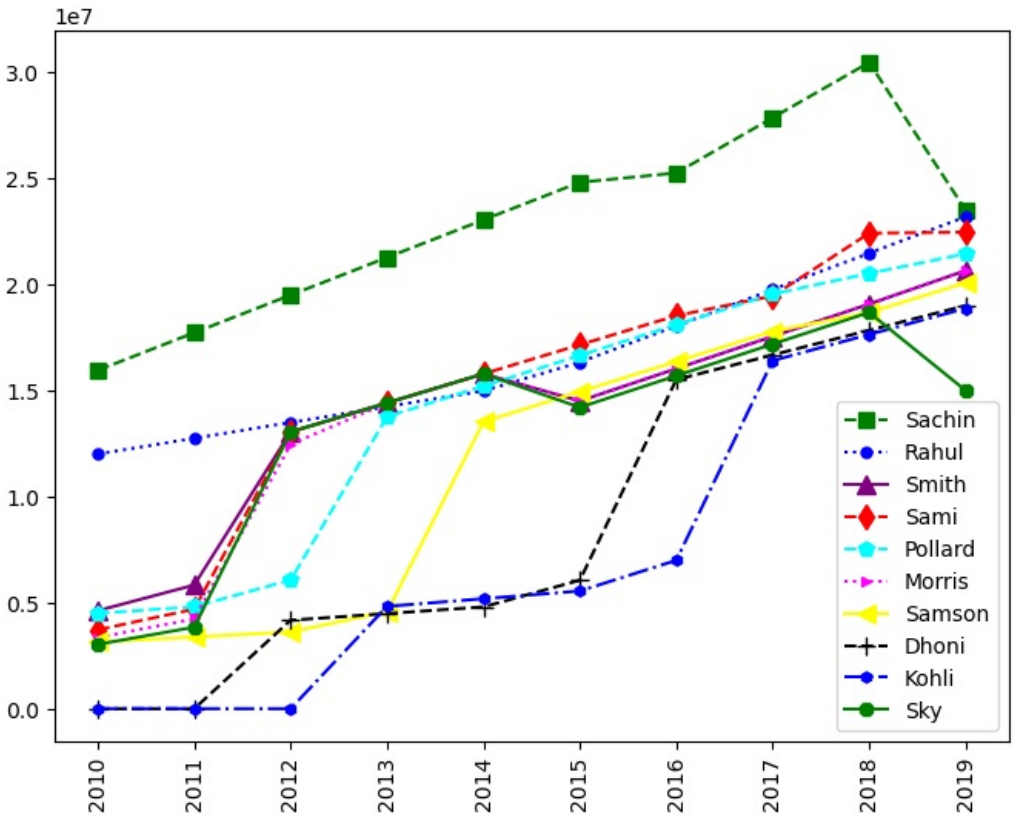
In [133…
```
plt.plot(Salary[4], c='cyan', ls = '--', marker = 's', ms = 7, label = Players[4])
plt.plot(Salary[5], c='magenta', ls = ':', marker = 'o', ms = 5, label = Players[5])
plt.plot(Salary[6], c='yellow', ls = '-', marker = '^', ms = 8, label = Players[6])
plt.plot(Salary[7], c='black', ls = '--', marker = 'd', ms = 8, label = Players[7])
plt.plot(Salary[8], c='blue', ls = '--', marker = 'd', ms = 8, label = Players[8])
plt.plot(Salary[9], c='green', ls = '--', marker = 'd', ms = 8, label = Players[9])
plt.legend(loc='upper right')
plt.xticks(list(range(0,10)), Seasons,rotation='vertical')
```

Out[133…
```
([<matplotlib.axis.XTick at 0x2c5b686a1b0>,
  <matplotlib.axis.XTick at 0x2c5b686a780>,
  <matplotlib.axis.XTick at 0x2c5b62dfd40>,
  <matplotlib.axis.XTick at 0x2c5b6c90ec0>,
  <matplotlib.axis.XTick at 0x2c5b459f290>,
  <matplotlib.axis.XTick at 0x2c5b4639fa0>,
  <matplotlib.axis.XTick at 0x2c5b45b1340>,
  <matplotlib.axis.XTick at 0x2c5b5706d80>,
  <matplotlib.axis.XTick at 0x2c5b45b0e00>,
  <matplotlib.axis.XTick at 0x2c5b5773a10>],
 [Text(0, 0, '2010'),
  Text(1, 0, '2011'),
  Text(2, 0, '2012'),
  Text(3, 0, '2013'),
  Text(4, 0, '2014'),
  Text(5, 0, '2015'),
  Text(6, 0, '2016'),
  Text(7, 0, '2017'),
  Text(8, 0, '2018'),
  Text(9, 0, '2019')])
```



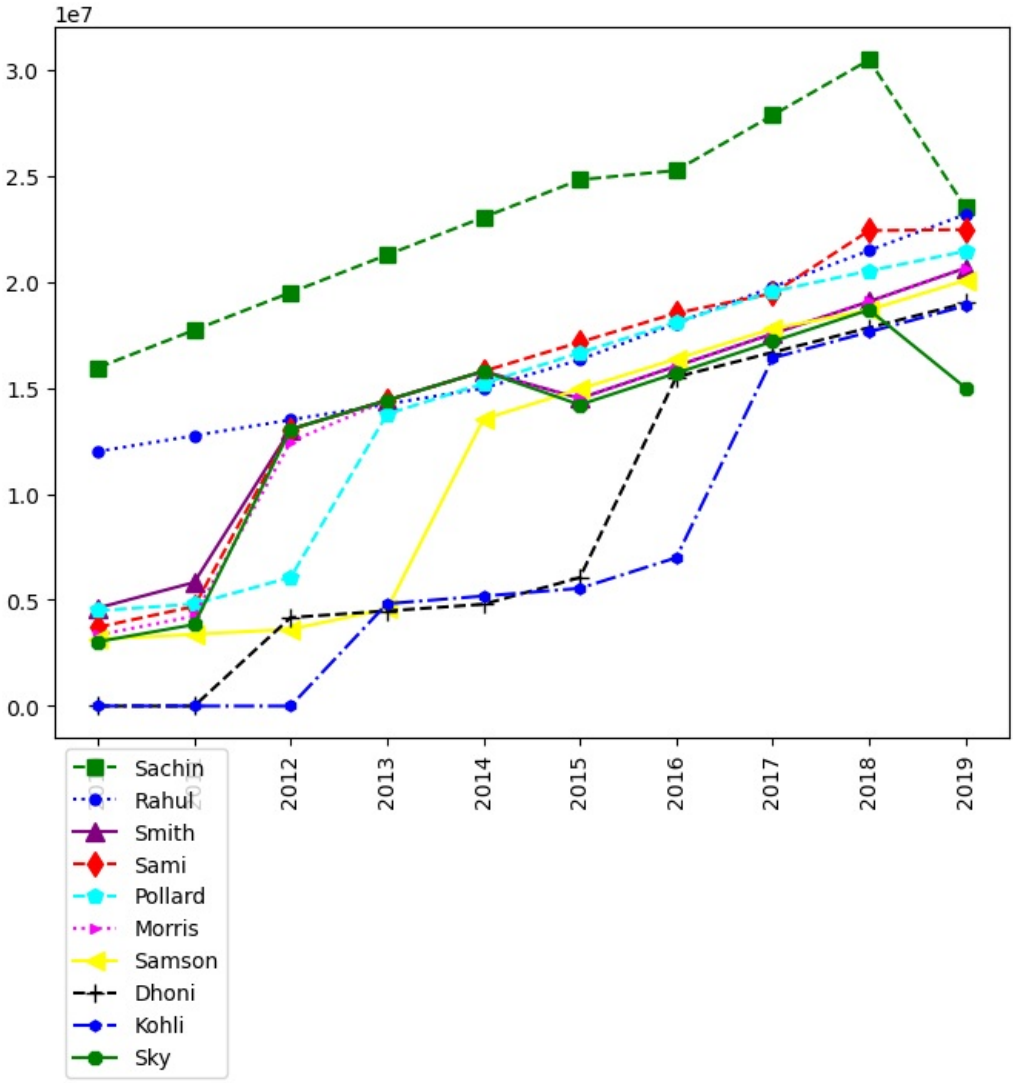
In [134…
```
plt.plot(Salary[0], c='Green', ls = '--', marker = 's', ms = 7, label = Players[0])
plt.plot(Salary[1], c='Blue', ls = ':', marker = 'o', ms = 5, label = Players[1])
plt.plot(Salary[2], c='purple', ls = '-', marker = '^', ms = 8, label = Players[2])
plt.plot(Salary[3], c='Red', ls = '--', marker = 'd', ms = 8, label = Players[3])
plt.plot(Salary[4], c='cyan', ls = '--', marker = 'p', ms = 7, label = Players[4])
plt.plot(Salary[5], c='magenta', ls = ':', marker = '>', ms = 5, label = Players[5])
plt.plot(Salary[6], c='yellow', ls = '-', marker = '<', ms = 8, label = Players[6])
plt.plot(Salary[7], c='black', ls = '--', marker = '+', ms = 8, label = Players[7])
plt.plot(Salary[8], c='blue', ls = '-.', marker = 'h', ms = 5, label = Players[8])
plt.plot(Salary[9], c='green', ls = '-', marker = '8', ms = 6, label = Players[9])
plt.legend()
plt.xticks(list(range(0,10)), Seasons,rotation='vertical')
```

Out[134…
```
([<matplotlib.axis.XTick at 0x2c5b59762d0>,
  <matplotlib.axis.XTick at 0x2c5b5a73050>,
  <matplotlib.axis.XTick at 0x2c5b5ed6000>,
  <matplotlib.axis.XTick at 0x2c5b67db4a0>,
  <matplotlib.axis.XTick at 0x2c5b5ea2b40>,
  <matplotlib.axis.XTick at 0x2c5b5ea3b60>,
  <matplotlib.axis.XTick at 0x2c5b5a27b00>,
  <matplotlib.axis.XTick at 0x2c5b43caa20>,
  <matplotlib.axis.XTick at 0x2c5b436ffe0>,
  <matplotlib.axis.XTick at 0x2c5b56d4140>],
 [Text(0, 0, '2010'),
  Text(1, 0, '2011'),
  Text(2, 0, '2012'),
  Text(3, 0, '2013'),
  Text(4, 0, '2014'),
  Text(5, 0, '2015'),
  Text(6, 0, '2016'),
  Text(7, 0, '2017'),
  Text(8, 0, '2018'),
  Text(9, 0, '2019')])
```



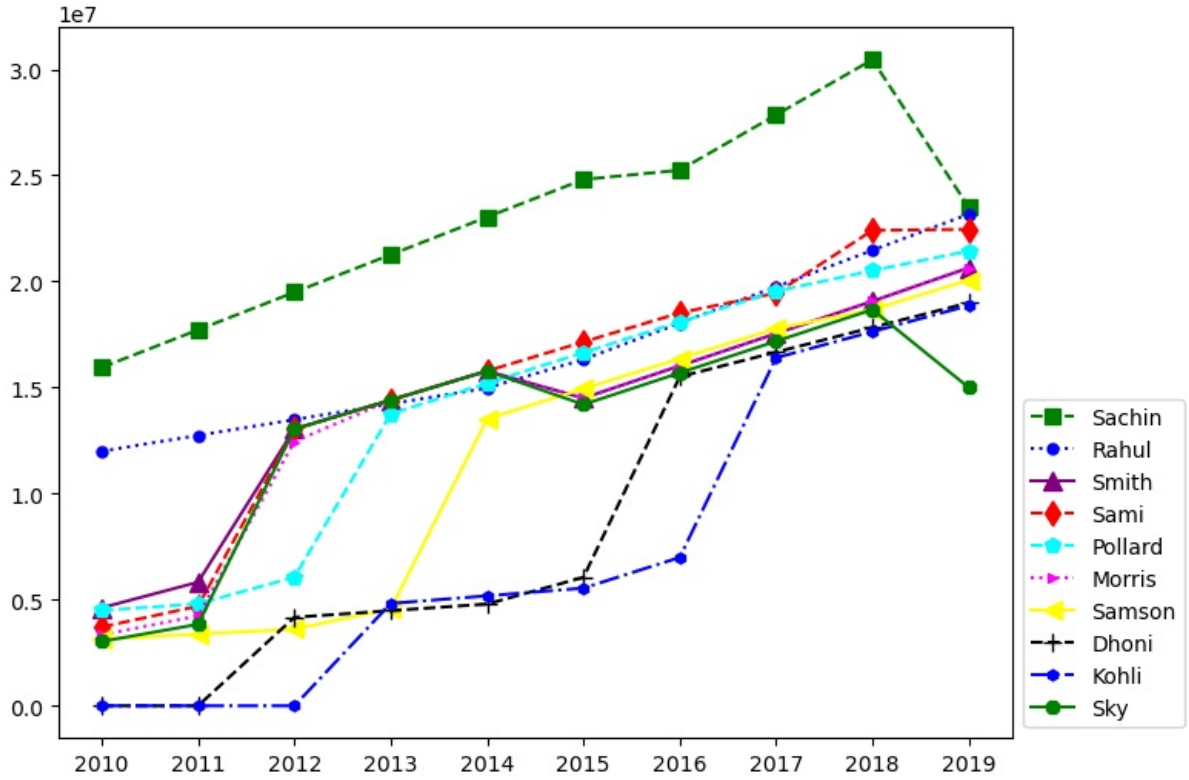
In [135…
```
plt.plot(Salary[0], c='Green', ls = '--', marker = 's', ms = 7, label = Players[0])
plt.plot(Salary[1], c='Blue', ls = ':', marker = 'o', ms = 5, label = Players[1])
plt.plot(Salary[2], c='purple', ls = '-', marker = '^', ms = 8, label = Players[2])
plt.plot(Salary[3], c='Red', ls = '--', marker = 'd', ms = 8, label = Players[3])
plt.plot(Salary[4], c='cyan', ls = '--', marker = 'p', ms = 7, label = Players[4])
plt.plot(Salary[5], c='magenta', ls = ':', marker = '>', ms = 5, label = Players[5])
plt.plot(Salary[6], c='yellow', ls = '-', marker = '<', ms = 8, label = Players[6])
plt.plot(Salary[7], c='black', ls = '--', marker = '+', ms = 8, label = Players[7])
plt.plot(Salary[8], c='blue', ls = '-.', marker = 'h', ms = 5, label = Players[8])
plt.plot(Salary[9], c='green', ls = '-', marker = '8', ms = 6, label = Players[9])
plt.legend(loc='upper left',bbox_to_anchor=(0,0))
plt.xticks(list(range(0,10)), Seasons,rotation='vertical')
```

Out[135…
```
([<matplotlib.axis.XTick at 0x2c5b453e2d0>,
  <matplotlib.axis.XTick at 0x2c5b71304d0>,
  <matplotlib.axis.XTick at 0x2c5b58d01d0>,
  <matplotlib.axis.XTick at 0x2c5b7149f40>,
  <matplotlib.axis.XTick at 0x2c5b71a6bd0>,
  <matplotlib.axis.XTick at 0x2c5b71a74d0>,
  <matplotlib.axis.XTick at 0x2c5b71a7e30>,
  <matplotlib.axis.XTick at 0x2c5b71c46e0>,
  <matplotlib.axis.XTick at 0x2c5b71a70b0>,
  <matplotlib.axis.XTick at 0x2c5b71c4e30>],
 [Text(0, 0, '2010'),
  Text(1, 0, '2011'),
  Text(2, 0, '2012'),
  Text(3, 0, '2013'),
  Text(4, 0, '2014'),
  Text(5, 0, '2015'),
  Text(6, 0, '2016'),
  Text(7, 0, '2017'),
  Text(8, 0, '2018'),
  Text(9, 0, '2019')])
```



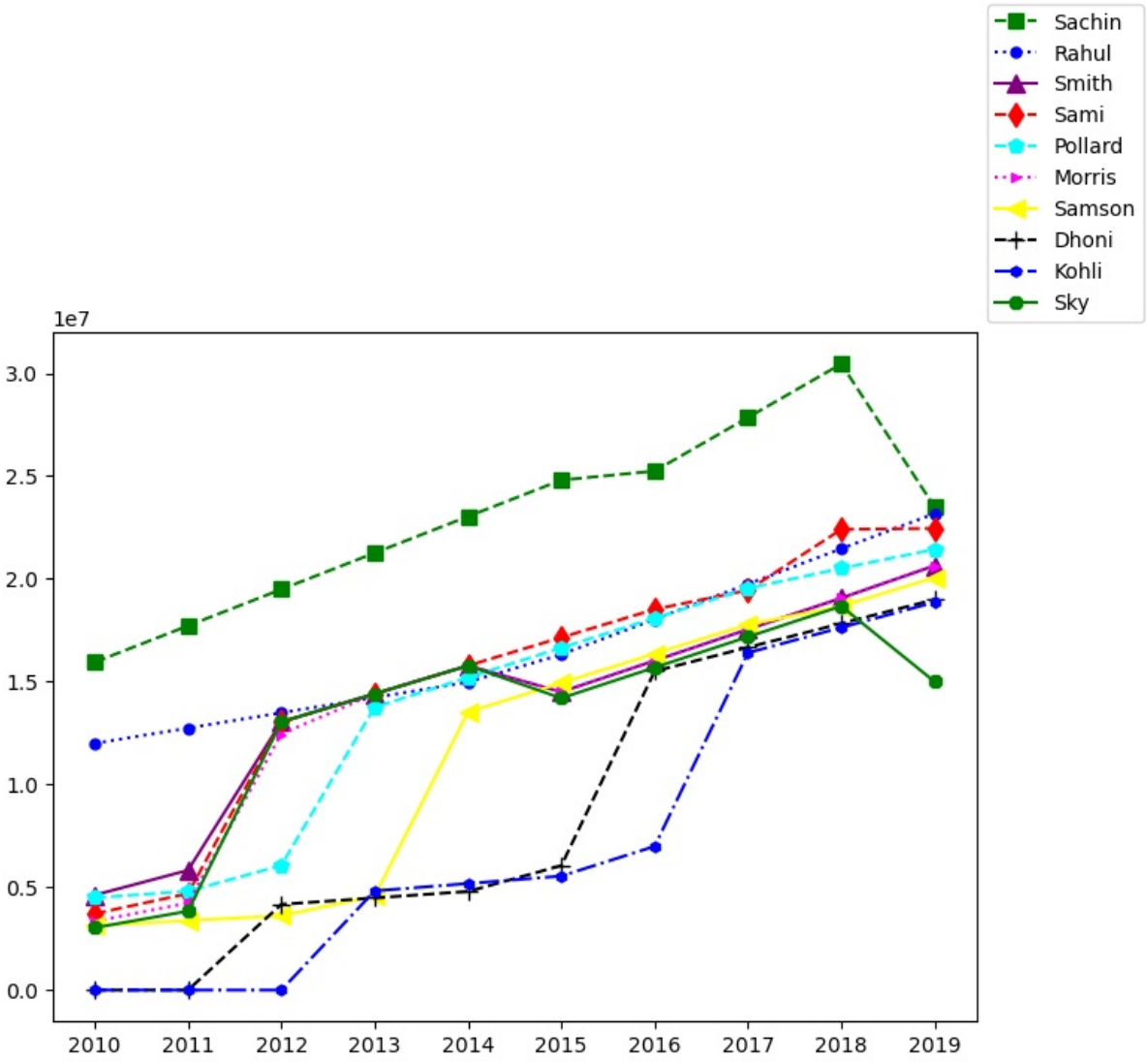
In [136…
```
plt.plot(Salary[0], c='Green', ls = '--', marker = 's', ms = 7, label = Players[0])
plt.plot(Salary[1], c='Blue', ls = ':', marker = 'o', ms = 5, label = Players[1])
plt.plot(Salary[2], c='purple', ls = '-', marker = '^', ms = 8, label = Players[2])
plt.plot(Salary[3], c='Red', ls = '--', marker = 'd', ms = 8, label = Players[3])
plt.plot(Salary[4], c='cyan', ls = '--', marker = 'p', ms = 7, label = Players[4])
plt.plot(Salary[5], c='magenta', ls = ':', marker = '>', ms = 5, label = Players[5])
plt.plot(Salary[6], c='yellow', ls = '-', marker = '<', ms = 8, label = Players[6])
plt.plot(Salary[7], c='black', ls = '--', marker = '+', ms = 8, label = Players[7])
plt.plot(Salary[8], c='blue', ls = '-.', marker = 'h', ms = 5, label = Players[8])
plt.plot(Salary[9], c='green', ls = '-', marker = '8', ms = 6, label = Players[9])
plt.legend(loc='lower left', bbox_to_anchor=(1,0))
plt.xticks(list(range(0,10)), Seasons,rotation='horizontal')
```

Out[136…
```
([<matplotlib.axis.XTick at 0x2c5b71c62d0>,
  <matplotlib.axis.XTick at 0x2c5b59b4e60>,
  <matplotlib.axis.XTick at 0x2c5b714ac60>,
  <matplotlib.axis.XTick at 0x2c5b74b3bc0>,
  <matplotlib.axis.XTick at 0x2c5b74d45c0>,
  <matplotlib.axis.XTick at 0x2c5b74d4ef0>,
  <matplotlib.axis.XTick at 0x2c5b74d5880>,
  <matplotlib.axis.XTick at 0x2c5b74d6270>,
  <matplotlib.axis.XTick at 0x2c5b74b3f80>,
  <matplotlib.axis.XTick at 0x2c5b74d69c0>],
 [Text(0, 0, '2010'),
  Text(1, 0, '2011'),
  Text(2, 0, '2012'),
  Text(3, 0, '2013'),
  Text(4, 0, '2014'),
  Text(5, 0, '2015'),
  Text(6, 0, '2016'),
  Text(7, 0, '2017'),
  Text(8, 0, '2018'),
  Text(9, 0, '2019')])
```



In [137…
```
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.plot(Salary[4], c='cyan', ls = '--', marker = 'p', ms = 7, label = Players[4])
plt.plot(Salary[5], c='magenta', ls = ':', marker = '>', ms = 5, label = Players[5])
plt.plot(Salary[6], c='yellow', ls = '-', marker = '<', ms = 8, label = Players[6])
plt.plot(Salary[7], c='black', ls = '--', marker = '+', ms = 8, label = Players[7])
plt.plot(Salary[8], c='blue', ls = '-.', marker = 'h', ms = 5, label = Players[8])
plt.plot(Salary[9], c='green', ls = '-', marker = '8', ms = 6, label = Players[9])
plt.legend(loc='lower left', bbox_to_anchor=(1,1))
plt.xticks(list(range(0,10)), Seasons,rotation='horizontal')
```

Out[137…
```
([<matplotlib.axis.XTick at 0x2c5b74d4c80>,
  <matplotlib.axis.XTick at 0x2c5b71dca10>,
  <matplotlib.axis.XTick at 0x2c5b75522a0>,
  <matplotlib.axis.XTick at 0x2c5b75797c0>,
  <matplotlib.axis.XTick at 0x2c5b757a090>,
  <matplotlib.axis.XTick at 0x2c5b757aa80>,
  <matplotlib.axis.XTick at 0x2c5b757b3e0>,
  <matplotlib.axis.XTick at 0x2c5b757bd40>,
  <matplotlib.axis.XTick at 0x2c5b757b5c0>,
  <matplotlib.axis.XTick at 0x2c5b79dc530>],
 [Text(0, 0, '2010'),
  Text(1, 0, '2011'),
  Text(2, 0, '2012'),
  Text(3, 0, '2013'),
  Text(4, 0, '2014'),
  Text(5, 0, '2015'),
  Text(6, 0, '2016'),
  Text(7, 0, '2017'),
  Text(8, 0, '2018'),
  Text(9, 0, '2019')])
```

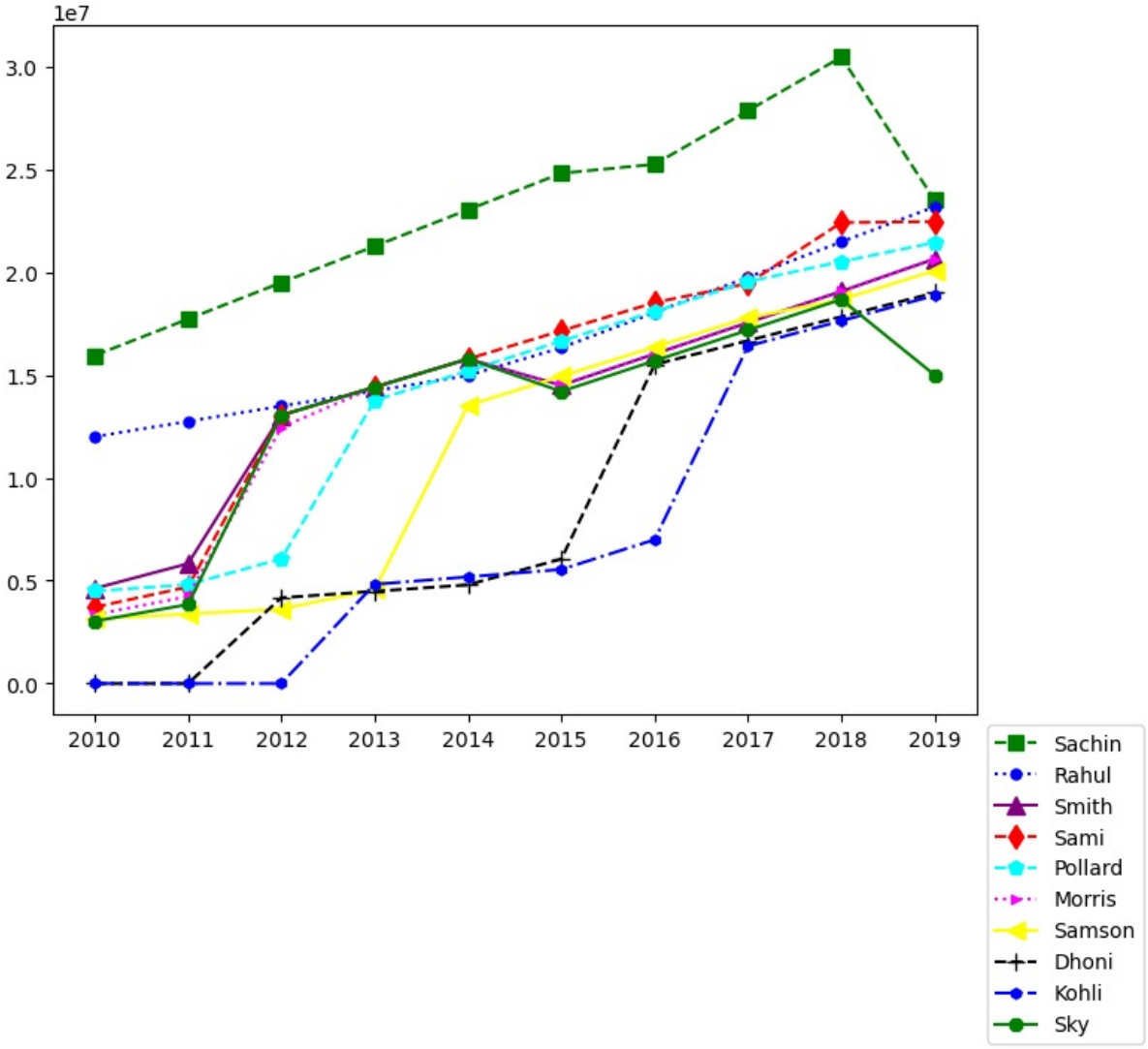


In [138…

```
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.plot(Salary[4], c='cyan', ls = '--', marker = 'p', ms = 7, label = Players[4])
plt.plot(Salary[5], c='magenta', ls = ':', marker = '>', ms = 5, label = Players[5])
plt.plot(Salary[6], c='yellow', ls = '-', marker = '<', ms = 8, label = Players[6])
plt.plot(Salary[7], c='black', ls = '--', marker = '+', ms = 8, label = Players[7])
plt.plot(Salary[8], c='blue', ls = '-.', marker = 'h', ms = 5, label = Players[8])
plt.plot(Salary[9], c='green', ls = '-', marker = '8', ms = 6, label = Players[9])
plt.legend(loc='upper left', bbox_to_anchor=(1,0))
plt.xticks(list(range(0,10)), Seasons,rotation='horizontal')
```

Out[138…

```
([<matplotlib.axis.XTick at 0x2c5b7a1b470>,
  <matplotlib.axis.XTick at 0x2c5b7a18410>,
  <matplotlib.axis.XTick at 0x2c5b638ea20>,
  <matplotlib.axis.XTick at 0x2c5b7a6ee10>,
  <matplotlib.axis.XTick at 0x2c5b7a6f740>,
  <matplotlib.axis.XTick at 0x2c5b7a6fd10>,
  <matplotlib.axis.XTick at 0x2c5b7a88b30>,
  <matplotlib.axis.XTick at 0x2c5b7a89490>,
  <matplotlib.axis.XTick at 0x2c5b7a6efc0>,
  <matplotlib.axis.XTick at 0x2c5b7a89cd0>],
 [Text(0, 0, '2010'),
  Text(1, 0, '2011'),
  Text(2, 0, '2012'),
  Text(3, 0, '2013'),
  Text(4, 0, '2014'),
  Text(5, 0, '2015'),
  Text(6, 0, '2016'),
  Text(7, 0, '2017'),
  Text(8, 0, '2018'),
  Text(9, 0, '2019')])
```

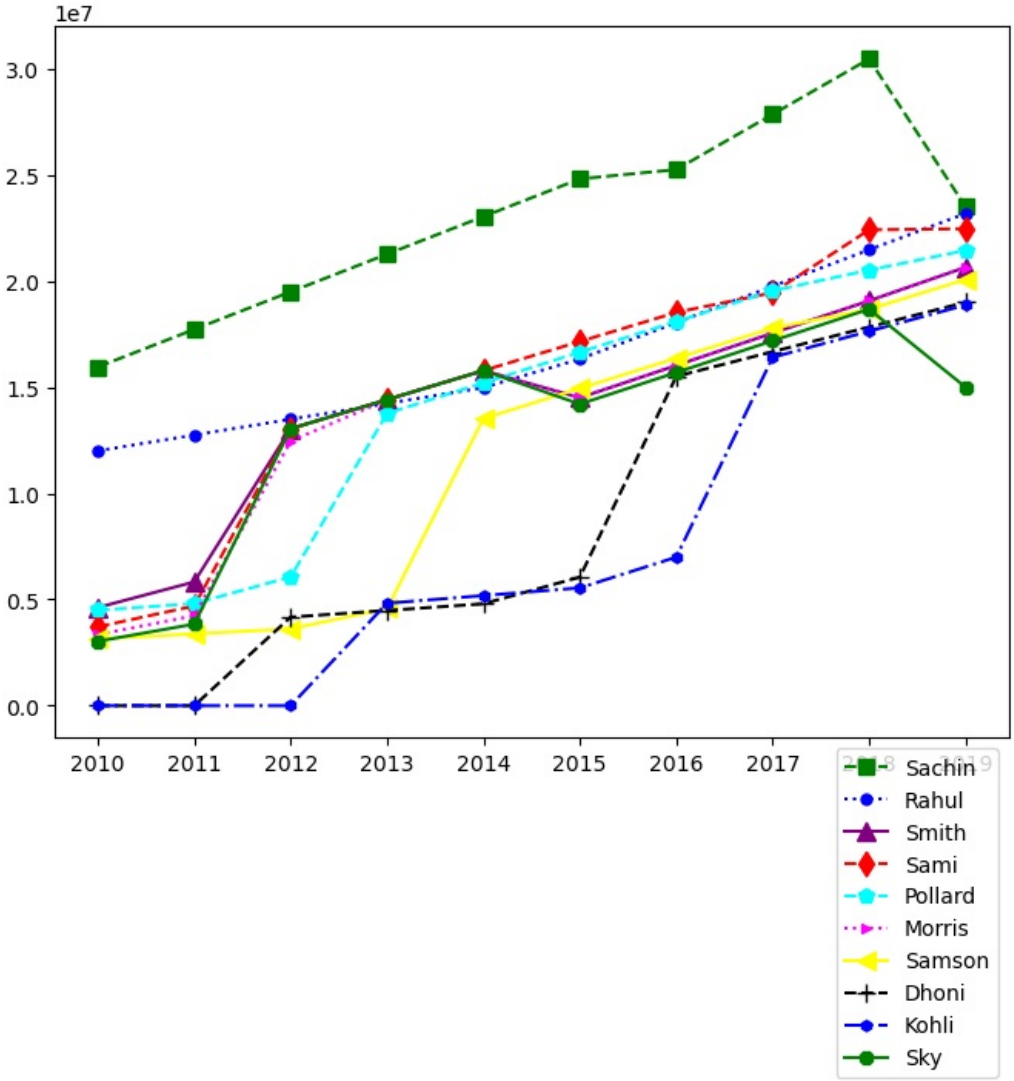


In [139…

```
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.plot(Salary[4], c='cyan', ls = '--', marker = 'p', ms = 7, label = Players[4])
plt.plot(Salary[5], c='magenta', ls = ':', marker = '>', ms = 5, label = Players[5])
plt.plot(Salary[6], c='yellow', ls = '-', marker = '<', ms = 8, label = Players[6])
plt.plot(Salary[7], c='black', ls = '--', marker = '+', ms = 8, label = Players[7])
plt.plot(Salary[8], c='blue', ls = '-.', marker = 'h', ms = 5, label = Players[8])
plt.plot(Salary[9], c='green', ls = '-', marker = '8', ms = 6, label = Players[9])
plt.legend(loc='upper right', bbox_to_anchor=(1,0))
plt.xticks(list(range(0,10)), Seasons,rotation='horizontal')
```

Out[139…

```
([<matplotlib.axis.XTick at 0x2c5b71dfbf0>,
  <matplotlib.axis.XTick at 0x2c5b7abc230>,
  <matplotlib.axis.XTick at 0x2c5b7a89640>,
  <matplotlib.axis.XTick at 0x2c5b7d8b7d0>,
  <matplotlib.axis.XTick at 0x2c5b7db9dc0>,
  <matplotlib.axis.XTick at 0x2c5b7dba840>,
  <matplotlib.axis.XTick at 0x2c5b7dbaf30>,
  <matplotlib.axis.XTick at 0x2c5b7dbb650>,
  <matplotlib.axis.XTick at 0x2c5b7dbae10>,
  <matplotlib.axis.XTick at 0x2c5b7de0800>],
 [Text(0, 0, '2010'),
  Text(1, 0, '2011'),
  Text(2, 0, '2012'),
  Text(3, 0, '2013'),
  Text(4, 0, '2014'),
  Text(5, 0, '2015'),
  Text(6, 0, '2016'),
  Text(7, 0, '2017'),
  Text(8, 0, '2018'),
  Text(9, 0, '2019')])
```



In [140…

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

plt.legend(loc = 'lower right',bbox_to_anchor=(0.5,1) )
plt.xticks(list(range(0,10)), Seasons,rotation='vertical')
```

```
Out[140…  ([<matplotlib.axis.XTick at 0x2c5b7df9eb0>,
            <matplotlib.axis.XTick at 0x2c5b7dfa780>,
            <matplotlib.axis.XTick at 0x2c5b7dfa210>,
            <matplotlib.axis.XTick at 0x2c5b818af60>,
            <matplotlib.axis.XTick at 0x2c5b818b560>,
            <matplotlib.axis.XTick at 0x2c5b818a300>,
            <matplotlib.axis.XTick at 0x2c5b818bd70>,
            <matplotlib.axis.XTick at 0x2c5b81ac6e0>,
            <matplotlib.axis.XTick at 0x2c5b81ace00>,
            <matplotlib.axis.XTick at 0x2c5b81ad4f0>],
           [Text(0, 0, '2010'),
            Text(1, 0, '2011'),
            Text(2, 0, '2012'),
            Text(3, 0, '2013'),
            Text(4, 0, '2014'),
            Text(5, 0, '2015'),
            Text(6, 0, '2016'),
            Text(7, 0, '2017'),
            Text(8, 0, '2018'),
            Text(9, 0, '2019')])
```