5y7u67dso

March 20, 2025

[2]:
```
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, Samson_Salary, Dhoni_Salary, Kohli_Salary,␣
 ↪Sky_Salary])

#Games
Sachin_G = [80,77,82,82,73,82,58,78,6,35]
Rahul_G = [82,57,82,79,76,72,60,72,79,80]
Smith_G = [79,78,75,81,76,79,62,76,77,69]
Sami_G = [80,65,77,66,69,77,55,67,77,40]
Pollard_G = [82,82,82,79,82,78,54,76,71,41]
Morris_G = [70,69,67,77,70,77,57,74,79,44]
Samson_G = [78,64,80,78,45,80,60,70,62,82]
Dhoni_G = [35,35,80,74,82,78,66,81,81,27]
Kohli_G = [40,40,40,81,78,81,39,0,10,51]
Sky_G = [75,51,51,79,77,76,49,69,54,62]
#Matrix
Games = np.array([Sachin_G, Rahul_G, Smith_G, Sami_G, Pollard_G, Morris_G,␣
 ↪Samson_G, Dhoni_G, Kohli_G, Sky_G])

#Points
Sachin_PTS = [2832,2430,2323,2201,1970,2078,1616,2133,83,782]
Rahul_PTS = [1653,1426,1779,1688,1619,1312,1129,1170,1245,1154]
Smith_PTS = [2478,2132,2250,2304,2258,2111,1683,2036,2089,1743]
Sami_PTS = [2122,1881,1978,1504,1943,1970,1245,1920,2112,966]
Pollard_PTS = [1292,1443,1695,1624,1503,1784,1113,1296,1297,646]
Morris_PTS = [1572,1561,1496,1746,1678,1438,1025,1232,1281,928]
Samson_PTS = [1258,1104,1684,1781,841,1268,1189,1186,1185,1564]
Dhoni_PTS = [903,903,1624,1871,2472,2161,1850,2280,2593,686]
Kohli_PTS = [597,597,597,1361,1619,2026,852,0,159,904]
Sky_PTS = [2040,1397,1254,2386,2045,1941,1082,1463,1028,1331]
#Matrix
Points = np.array([Sachin_PTS, Rahul_PTS, Smith_PTS, Sami_PTS, Pollard_PTS,␣
 ↪Morris_PTS, Samson_PTS, Dhoni_PTS, Kohli_PTS, Sky_PTS])
```

[4]:
```
Seasons
```

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

[6]:
```
Players
```

[6]:
```
['Sachin',
 'Rahul',
 'Smith',
 'Sami',
 'Pollard',
 'Morris',
 'Samson',
 'Dhoni',
 'Kohli',
 'Sky']
```

[12]:
```
Sachin_Salary
```

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

[14]:
```
Games
```

[14]:
```
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]])
```

[16]:
```
Points
```

[16]:
```
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]])
```

[18]:
```
Games
```

[18]:
```
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]])
```

[20]:
```
import numpy as np
```

[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]
```

[32]:
```
np.reshape(mydata,(4,5)) #5 columns and 4 rows
#reshape is used to arange the data in array format
```

[32]:
```
array([[ 0,  1,  2,  3,  4],
       [ 5,  6,  7,  8,  9],
       [10, 11, 12, 13, 14],
       [15, 16, 17, 18, 19]])
```

[34]:
```
mydata
```

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

[36]:
```
mat1=np.reshape(mydata,(5,4),order='c')
mat1
```

[36]:
```
array([[ 0,  1,  2,  3],
       [ 4,  5,  6,  7],
       [ 8,  9, 10, 11],
       [12, 13, 14, 15],
       [16, 17, 18, 19]])
```

[38]:
```
mat1
```

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

[42]:
```
mat1[4,3] #4th row and5th column
```

[42]:
```
19
```

[44]:
```
mat1[4,2]
```

[44]:
```
18
```

[46]:
```
mat1[3,3]
```

[46]:
```
15
```

[48]:
```
mat1
```

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

[50]:
```
mat1[-1,-3]
```

[50]:
```
17
```

[52]:
```
mydata
```

[52]:
```
array([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13, 14, 15, 16,
       17, 18, 19])
```

[54]:
```
mat1
```

[54]:
```
array([[ 0,  1,  2,  3],
       [ 4,  5,  6,  7],
       [ 8,  9, 10, 11],
       [12, 13, 14, 15],
       [16, 17, 18, 19]])
```

[68]:
```
mat2=np.reshape(mydata,(5,4),order='F') #C/F/A
```

[70]:
```
mat2
```

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

[72]:
```
mat2[4,3]
```

[72]:
```
19
```

[74]:
```
mat2[0,2]
```

[74]:
```
10
```

[76]:
```
mat2[0:2] #matrix slicing (0nd1)
```

[76]:
```
array([[ 0,  5, 10, 15],
       [ 1,  6, 11, 16]])
```

[78]:
```
mat2
```

[78]:
```
array([[ 0,  5, 10, 15],
       [ 1,  6, 11, 16],
       [ 2,  7, 12, 17],
       [ 3,  8, 13, 18],
       [ 4,  9, 14, 19]])
```

[80]:
```
mat2[1:2]
```

[80]:
```
array([[ 1,  6, 11, 16]])
```

[86]:
```
mat2[1,2]
```

[86]:
```
11
```

[89]:
```
mat2
```

[89]:
```
array([[ 0,  5, 10, 15],
       [ 1,  6, 11, 16],
       [ 2,  7, 12, 17],
       [ 3,  8, 13, 18],
       [ 4,  9, 14, 19]])
```

[91]:
```
mat2[-2,-2]
```

[91]:
```
13
```

[93]:
```
mat2[2:4]
```

[93]:
```
array([[ 2,  7, 12, 17],
       [ 3,  8, 13, 18]])
```

[95]:
```
mydata
```

[95]:
```
array([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13, 14, 15, 16,
       17, 18, 19])
```

[109]:
```
mat1=np.reshape(mydata,(5,4),order='C')
mat1
```

[109]:
```
array([[ 0,  1,  2,  3],
       [ 4,  5,  6,  7],
       [ 8,  9, 10, 11],
       [12, 13, 14, 15],
       [16, 17, 18, 19]])
```

[105]:
```
mat2=np.reshape(mydata,(5,4),order='F')
mat2
```

[105]:
```
array([[ 0,  5, 10, 15],
       [ 1,  6, 11, 16],
       [ 2,  7, 12, 17],
       [ 3,  8, 13, 18],
       [ 4,  9, 14, 19]])
```

[107]:
```
mat3=np.reshape(mydata,(5,4),order='A')
mat3
```

[107]:
```
array([[ 0,  1,  2,  3],
       [ 4,  5,  6,  7],
       [ 8,  9, 10, 11],
       [12, 13, 14, 15],
       [16, 17, 18, 19]])
```

[111]:
```
a1=['welcome','to','Datascience']
a2=['required','hard','work']
a3=[11,2,3]
```

[113]:
```
[a1,a2,a3]
```

[113]:
```
[['welcome', 'to', 'Datascience'], ['required', 'hard', 'work'], [11, 2, 3]]
```

[115]:
```
np.array([a1,a2,a3])
```

[115]:
```
array([['welcome', 'to', 'Datascience'],
       ['required', 'hard', 'work'],
       ['11', '2', '3']], dtype='<U11')
```

[123]:
```
a1=['welcome','to','Datascience']
a2=['required','hard','work']
a3=[1,2,3]
```

[125]:
```
np.array([a1,a2,a3])
```

[125]:
```
array([['welcome', 'to', 'Datascience'],
       ['required', 'hard', 'work'],
       ['1', '2', '3']], dtype='<U11')
```

[127]:
```
Games
```

[127]:
```
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]])
```

[129]:
```
Games[0]
```

[129]:
```
array([80, 77, 82, 82, 73, 82, 58, 78,  6, 35])
```

[131]:
```
Games[1]
```

[131]:
```
array([82, 57, 82, 79, 76, 72, 60, 72, 79, 80])
```

[135]:
```
Games[5]
```

[135]:
```
array([70, 69, 67, 77, 70, 77, 57, 74, 79, 44])
```

[137]:
```
Games[0:5]
```

[137]:
```
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]])
```

[143]:
```
Games[0,2]
```

[143]:
```
82
```

[146]:
```
Games[0,6]
```

[146]:
```
58
```

[150]:
```
Games
```

[150]:
```
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]])
```

[152]:
```
Games[2]
```

[152]:
```
array([79, 78, 75, 81, 76, 79, 62, 76, 77, 69])
```

[154]:
```
Games[2,8]
```

[154]:
```
77
```

[156]:
```
Games
```

[156]:
```
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]])
```

[158]:
```
Games[5:6]
```

[158]:
```
array([[70, 69, 67, 77, 70, 77, 57, 74, 79, 44]])
```

[160]:
```
Games[5,6]
```

[160]:
```
57
```

[162]:
```
Games[-3,-1]
```

[162]:
```
27
```

[165]:
```
Points
```

[165]:
```
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]])
```

[167]:
```
Points[3:6]
```

[167]:
```
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]])
```

[169]:
```
Points[-6,-2]
```

[169]:
```
1297
```

[171]:
```
dict1 = {'key1':'val1', 'key2':'val2', 'key3':'val3'}
```

[173]:
```
dict1
```

[173]:
```
{'key1': 'val1', 'key2': 'val2', 'key3': 'val3'}
```

[175]:
```
dict1['key2']
```

[175]:
```
'val2'
```

[177]:
```
dict2 = {'bang':2,'hyd':'we are hear', 'pune':True}
```

[179]:
```
dict2
```

[179]:
```
{'bang': 2, 'hyd': 'we are hear', 'pune': True}
```

[181]:
```
dict2['hyd']
```

[181]:
```
'we are hear'
```

[185]:
```
Pdict
```

[185]:
```
{'Sachin': 0,
 'Rahul': 1,
 'Smith': 2,
 'Sami': 3,
 'Pollard': 4,
 'Morris': 5,
 'Samson': 6,
 'Dhoni': 7,
 'Kohli': 8,
 'Sky': 9}
```

[187]:
```
Pdict['Sachin']
```

[187]:
```
0
```

[191]:
```
Pdict['Dhoni']
```

[191]:
```
7
```

[193]:
```
Games[7]
```

[193]:
```
array([35, 35, 80, 74, 82, 78, 66, 81, 81, 27])
```

1 Games

[196]:
```
Games[Pdict['Dhoni']]
```

[196]:
```
array([35, 35, 80, 74, 82, 78, 66, 81, 81, 27])
```

[200]:
```
Salary
```

[200]:
```
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]])
```

[202]:
```
Salary[2,4]
```

[202]:
```
15779912
```

[204]:
```
Salary
```

[204]:
```
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]])
```

[206]:
```
Salary[Pdict['Sky']][Sdict['2019']]
```

[206]:
```
15000000
```

[208]:
```
Salary
```

[208]:
```
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]])
```

[210]:
```
Games
```

[210]:
```
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]])
```

[212]:
```
Salary/Games
```

```
C:\Users\Dhanwantari Devre\AppData\Local\Temp\ipykernel_32516\3709746658.py:1:
RuntimeWarning: divide by zero encountered in divide
  Salary/Games
```

[212]:
```
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]])
```

[216]:
```
np.round(Salary/Games)
```

```
C:\Users\Dhanwantari Devre\AppData\Local\Temp\ipykernel_32516\3232172828.py:1:
RuntimeWarning: divide by zero encountered in divide
  np.round(Salary/Games)
```

[216]:
```
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.]])
```

[230]:
```
import warnings
warnings.filterwarnings('ignore')
np.round(Salary/Games)
```

[230]:
```
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.]])
```

[232]:
```
import numpy as np
```

[234]:
```
import matplotlib.pyplot as plt
```

[240]:
```
%matplotlib inline
# keep the plot inside jupyter nots insted of getting in other screen
```

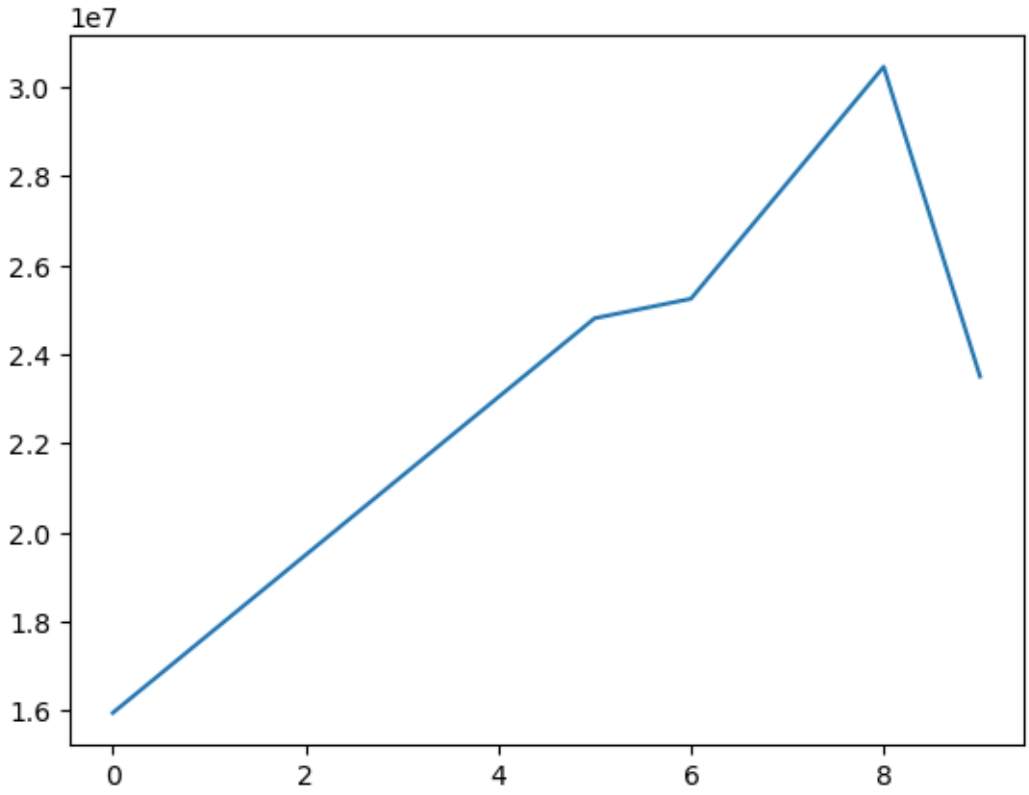
[243]:
```
Salary
```

[243]:
```
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]])
```

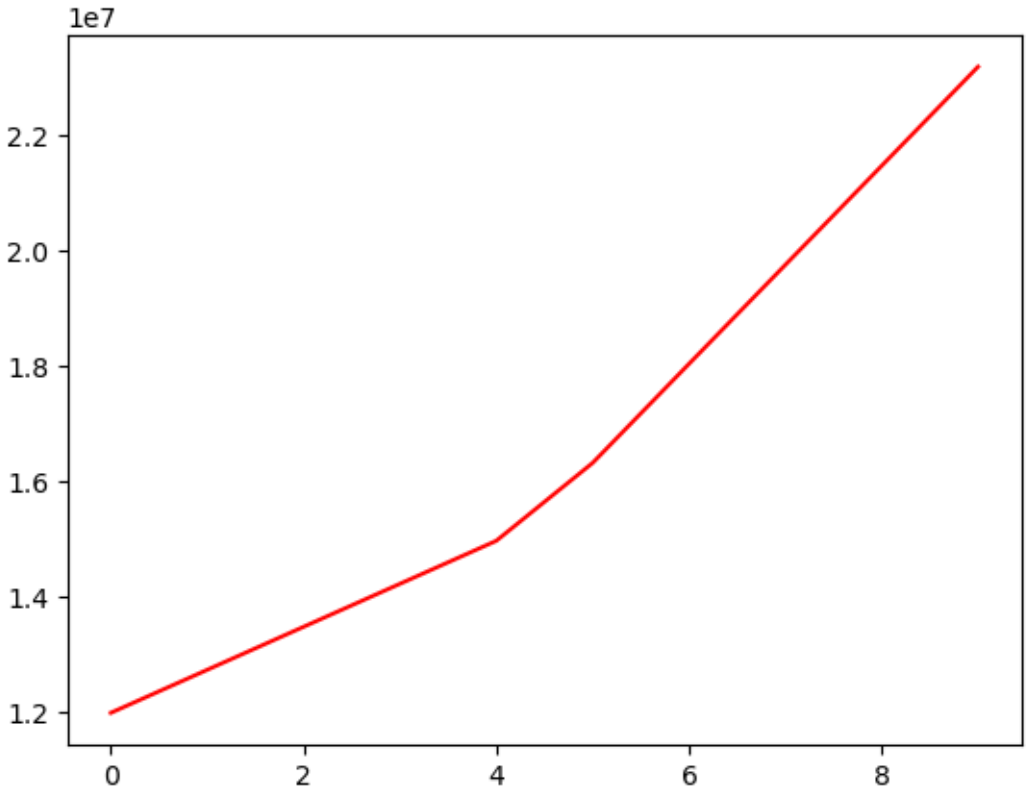
[245]:
```
Salary[0]
```

[245]:
```
array([15946875, 17718750, 19490625, 21262500, 23034375, 24806250,
       25244493, 27849149, 30453805, 23500000])
```

[255]:
```
plt.plot(Salary[0])
plt.show()
```

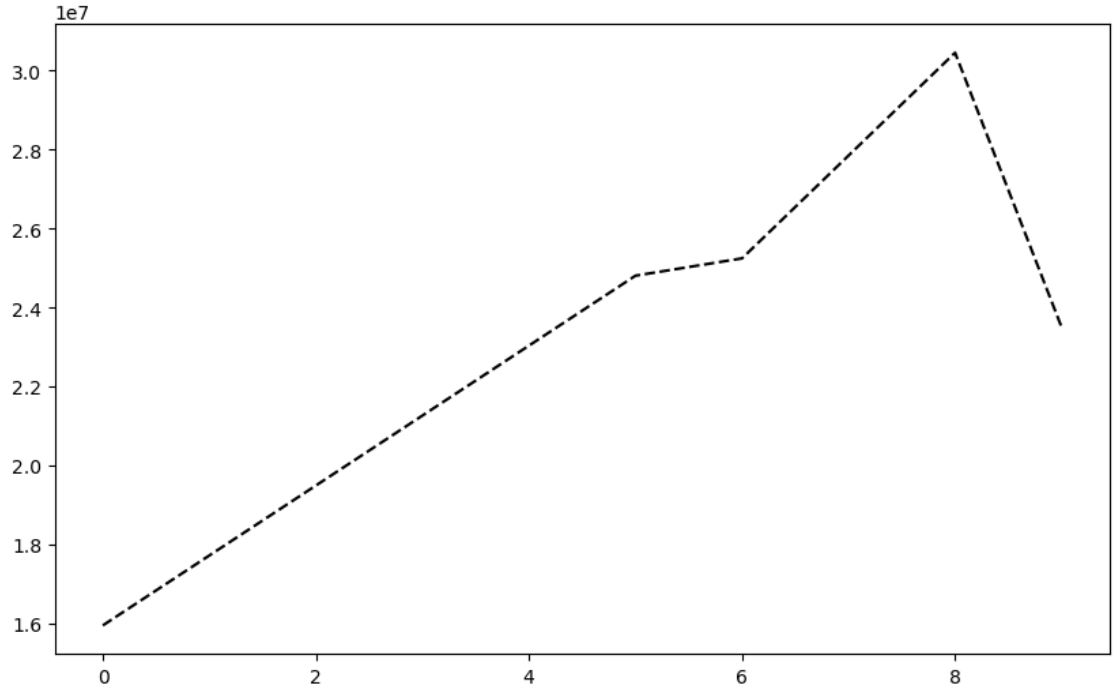


[257]:
```
plt.plot(Salary[1],c='red')
plt.show()
```

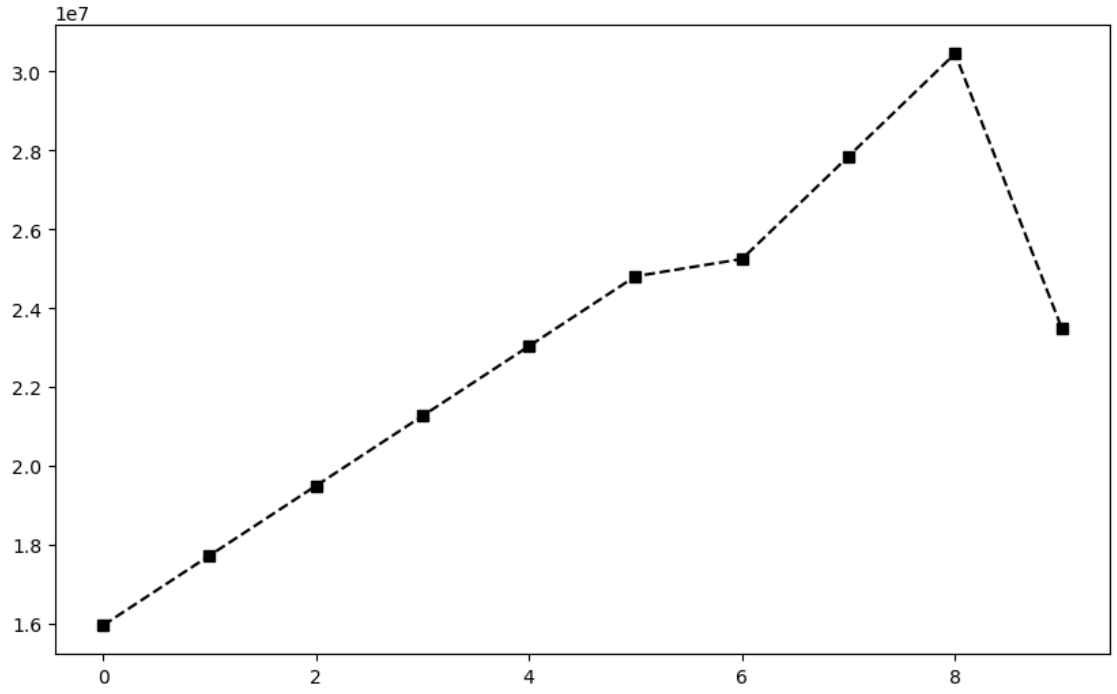


[293]:
```
%matplotlib inline
plt.rcParams['figure.figsize']=10,6
```

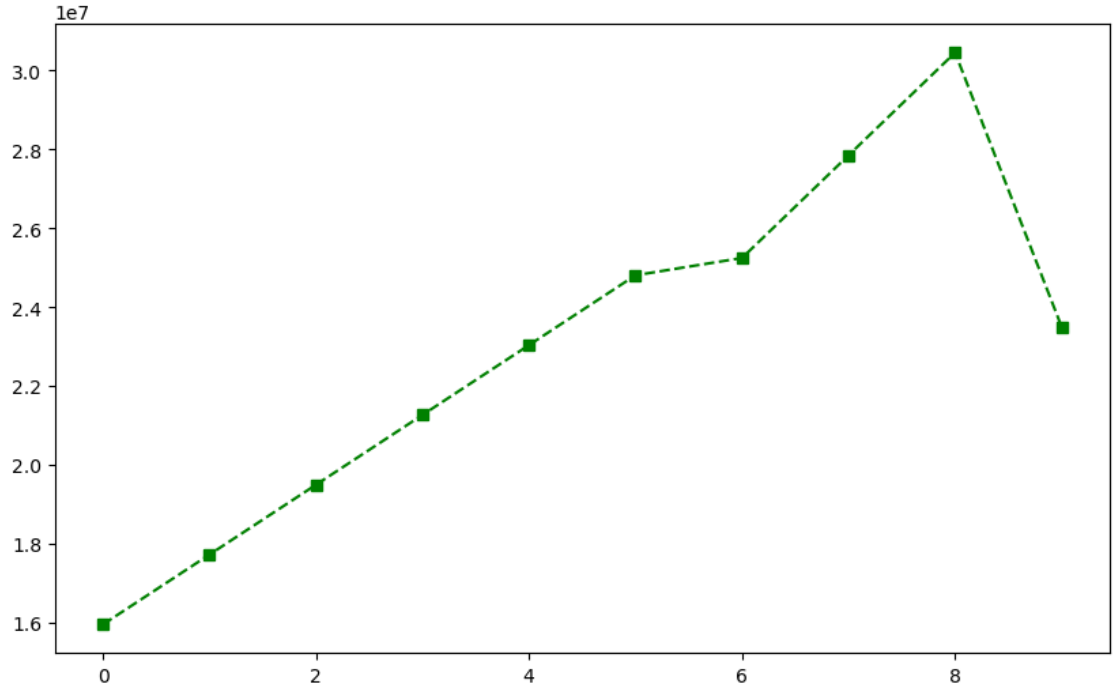
[295]:
```
plt.plot(Salary[0],c='k',ls='dashed') #line shape
plt.show()
```



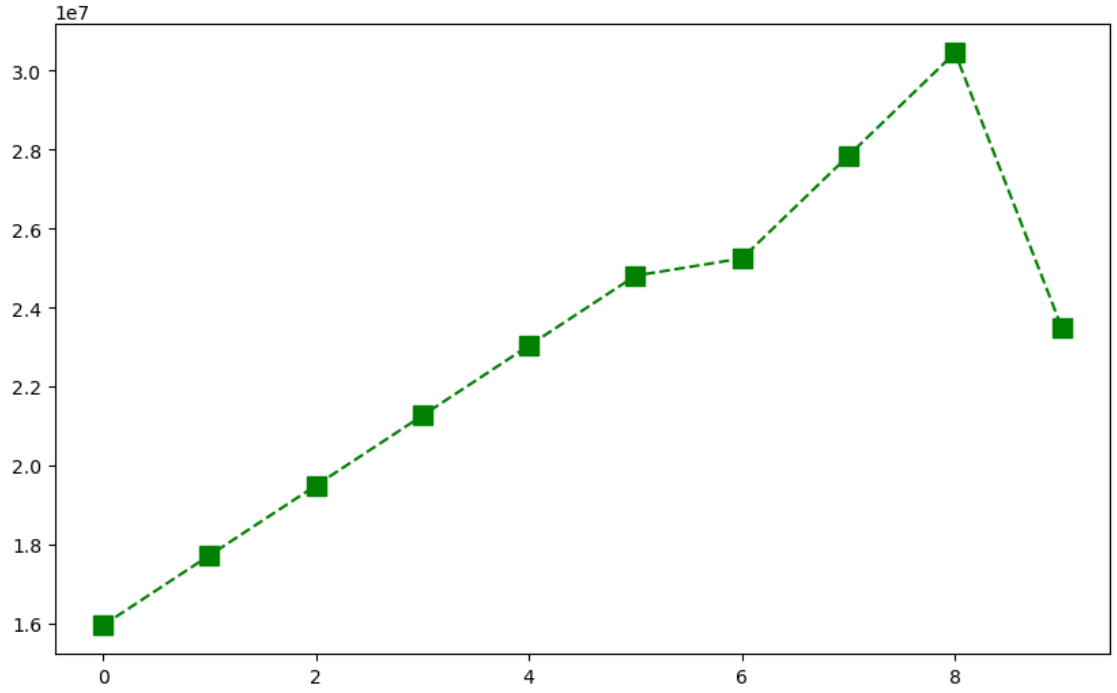
[297]:
```
plt.plot(Salary[0],c='k',ls='dashed',marker='s') #line shape
plt.show()
```



[301]:
```
plt.plot(Salary[0],c='Green',ls='--', marker='s') #line shape
plt.show()
```



[307]:
```
plt.plot(Salary[0],c='Green',ls='--', marker='s',ms=10) #line shape
plt.show()
```



[309]:
```
list(range(0,10))
```

[309]:
```
[0, 1, 2, 3, 4, 5, 6, 7, 8, 9]
```

[311]:
```
Sdict
```

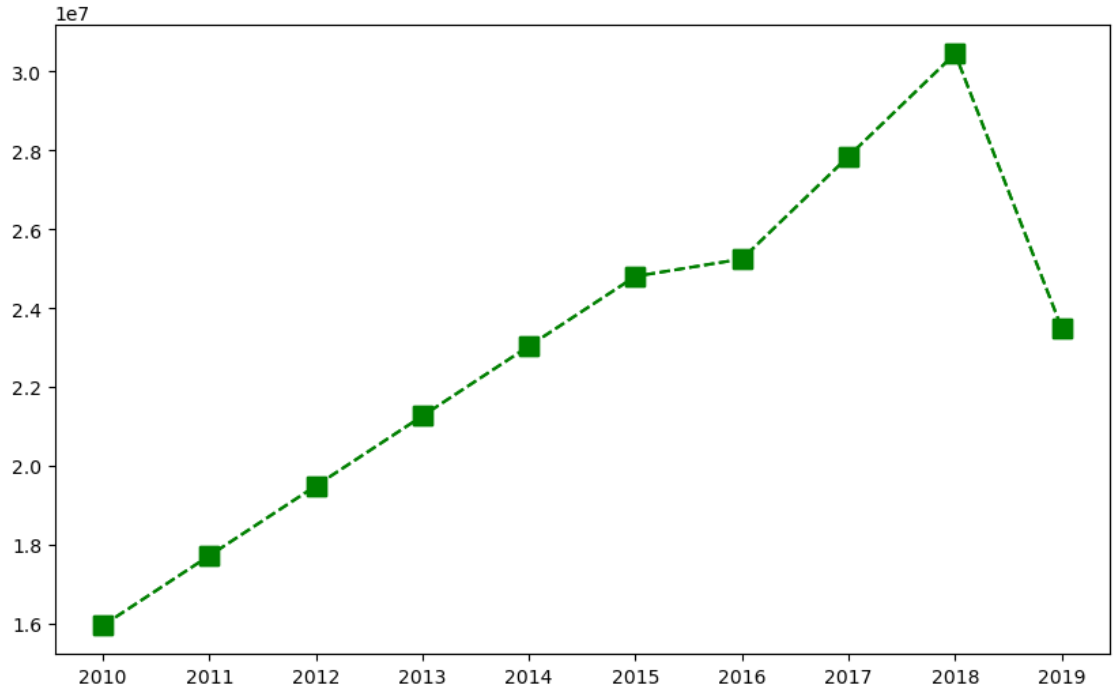
[311]:
```
{'2010': 0,
 '2011': 1,
 '2012': 2,
 '2013': 3,
 '2014': 4,
 '2015': 5,
 '2016': 6,
 '2017': 7,
 '2018': 8,
 '2019': 9}
```

[313]:
```
Pdict
```

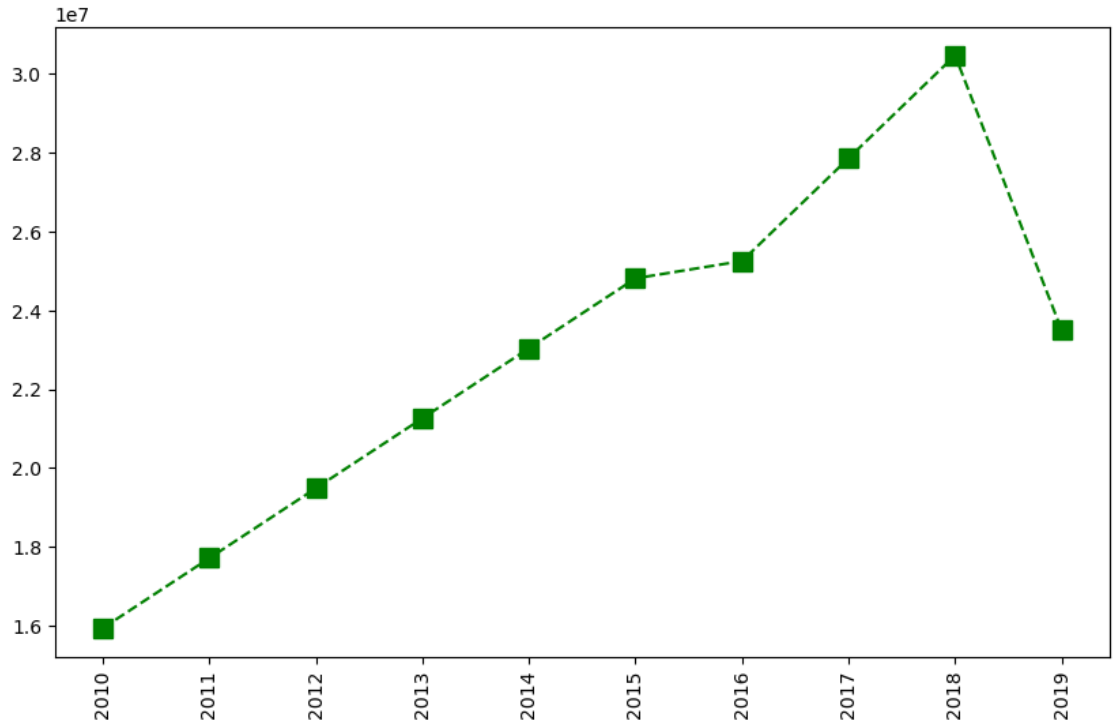
[313]:
```
{'Sachin': 0,
 'Rahul': 1,
 'Smith': 2,
 'Sami': 3,
 'Pollard': 4,
```

```
 'Morris': 5,
 'Samson': 6,
 'Dhoni': 7,
 'Kohli': 8,
 'Sky': 9}
```

[329]:
```
plt.plot(Salary[0], c='Green', ls = '--', marker='s',ms=10)
plt.xticks(list(range(0,10)),Seasons)
plt.show()
```



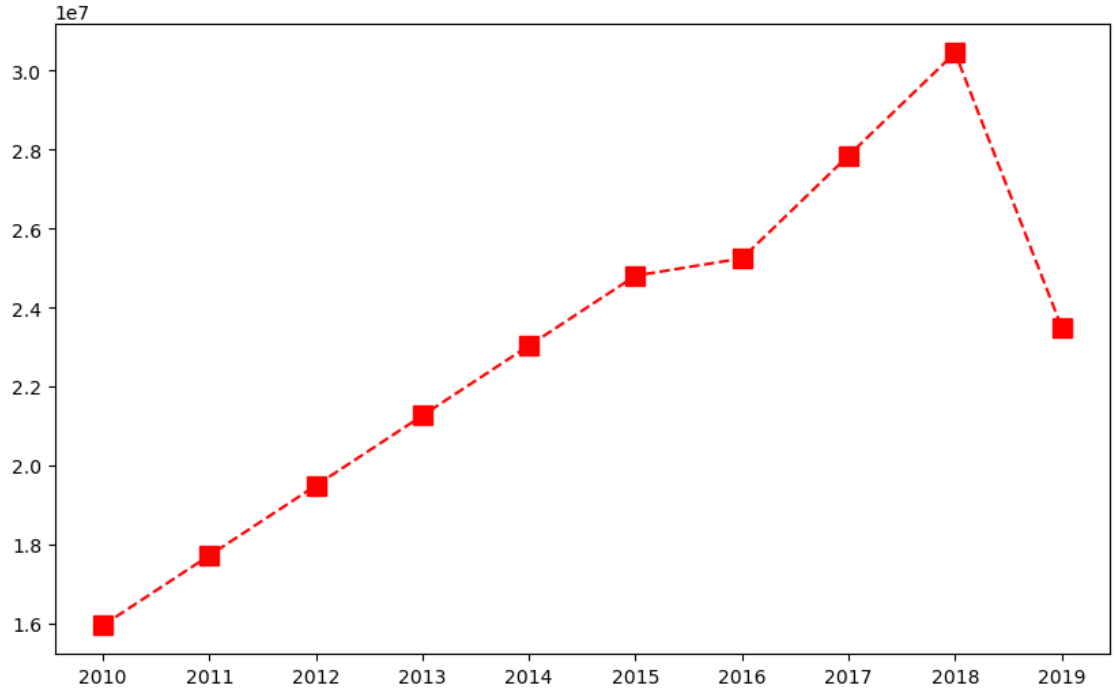
[331]:
```
plt.plot(Salary[0], c='Green', ls = '--', marker='s',ms=10)
plt.xticks(list(range(0,10)),Seasons,rotation='vertical')
plt.show()
```



[335]:
```
Games
```

[335]:
```
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]])
```

[345]:
```
plt.plot(Salary[0],c='r', ls='--', marker='s', ms='10')
plt.xticks(list(range(0,10)),Seasons,rotation='horizontal')
plt.show()
```



[347]:
```
Salary[0]
```

[347]:
```
array([15946875, 17718750, 19490625, 21262500, 23034375, 24806250,
       25244493, 27849149, 30453805, 23500000])
```

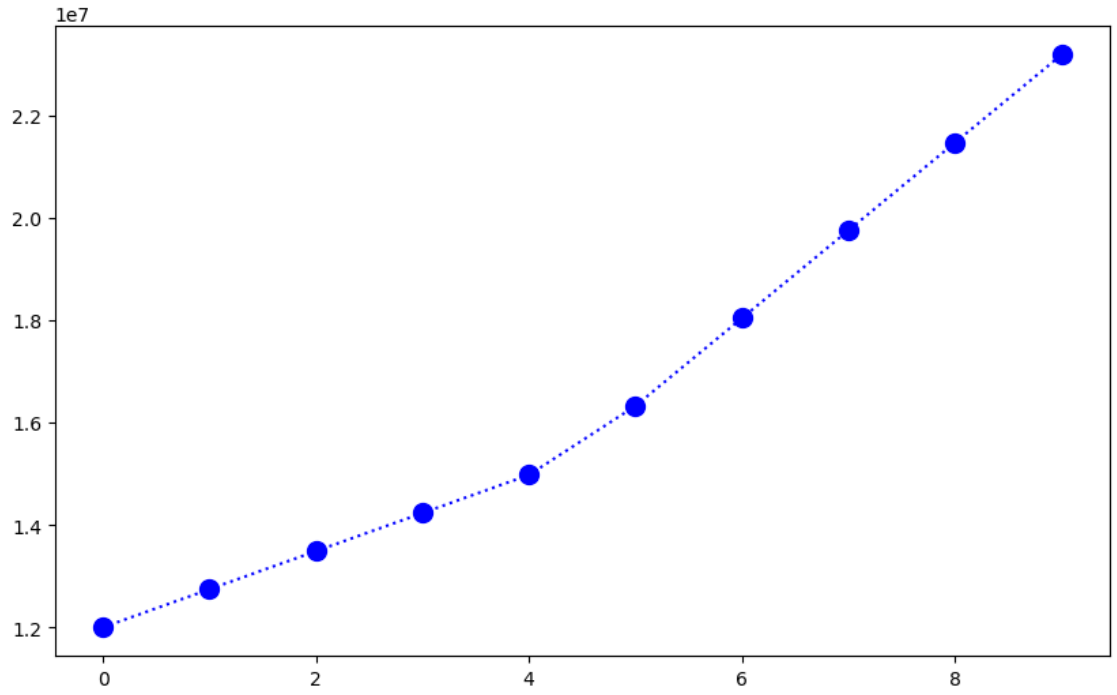
[349]:
```
Salary[1]
```

[349]:
```
array([12000000, 12744189, 13488377, 14232567, 14976754, 16324500,
       18038573, 19752645, 21466718, 23180790])
```

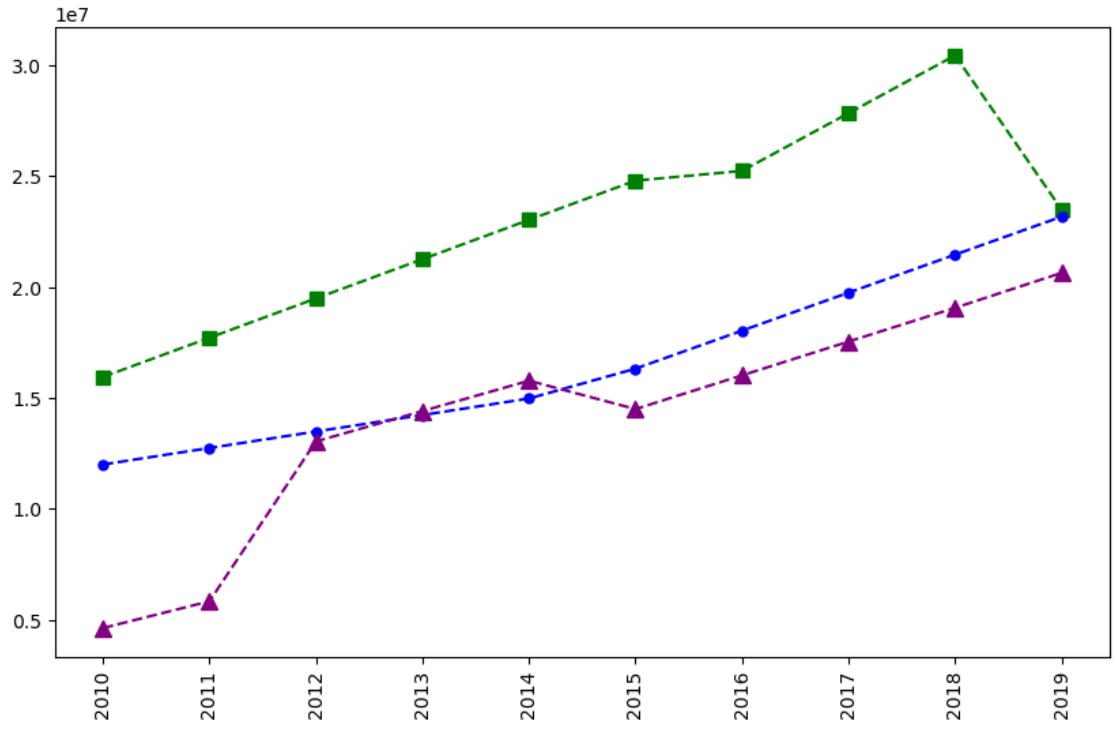
[351]:
```
plt.plot(Salary[1], c='Blue', ls = ':', marker = 'o', ms = 10, label =␣
 ↪Players[1])
```

[351]:
```
[<matplotlib.lines.Line2D at 0x21bf9965160>]
```

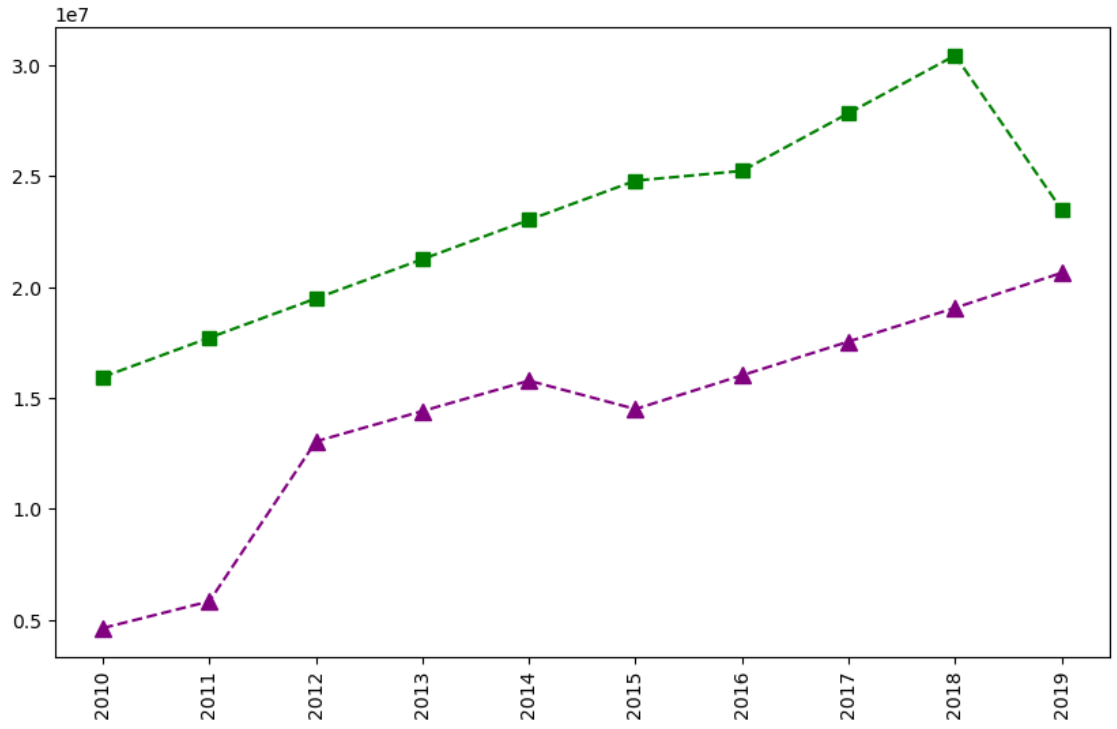
[353]:
```
plt.show()
```



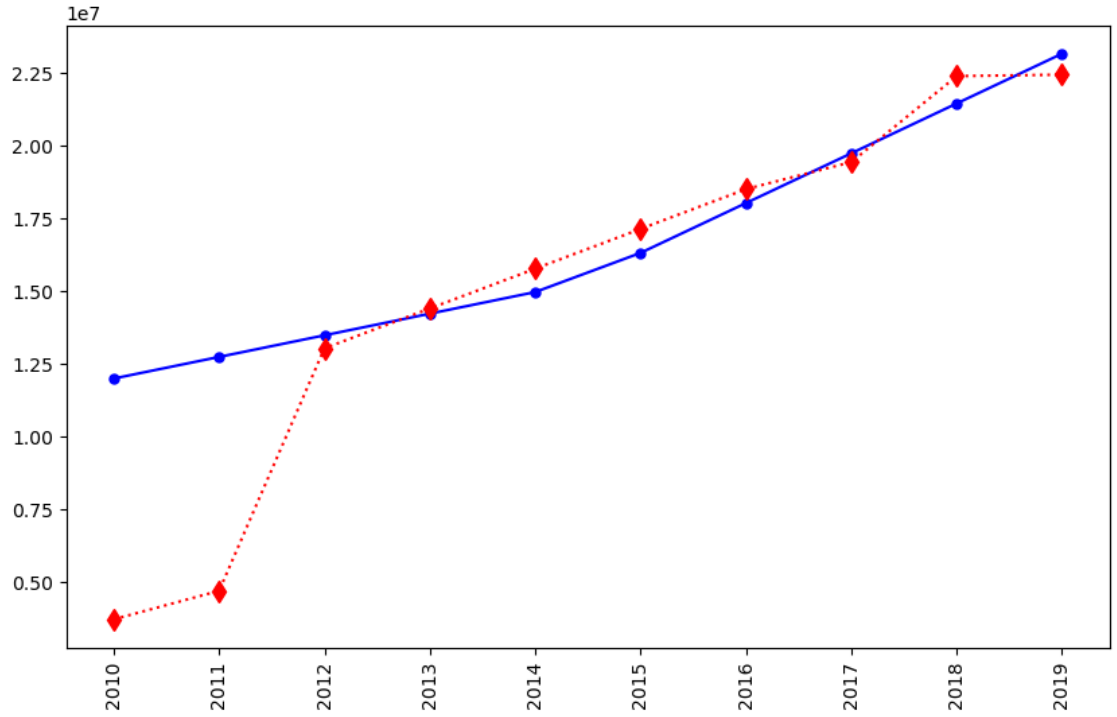
[355]:
```
plt.plot(Salary[0], c='Green', ls = '--', marker = 's', ms = 7, label =␣
 ↪Players[0])
plt.plot(Salary[1], c='Blue', ls = '--', marker = 'o', ms = 5, label =␣
 ↪Players[1])
plt.plot(Salary[2], c='purple', ls = '--', marker = '^', ms = 8, label =␣
 ↪Players[2])
plt.xticks(list(range(0,10)), Seasons,rotation='vertical')
plt.show()
```



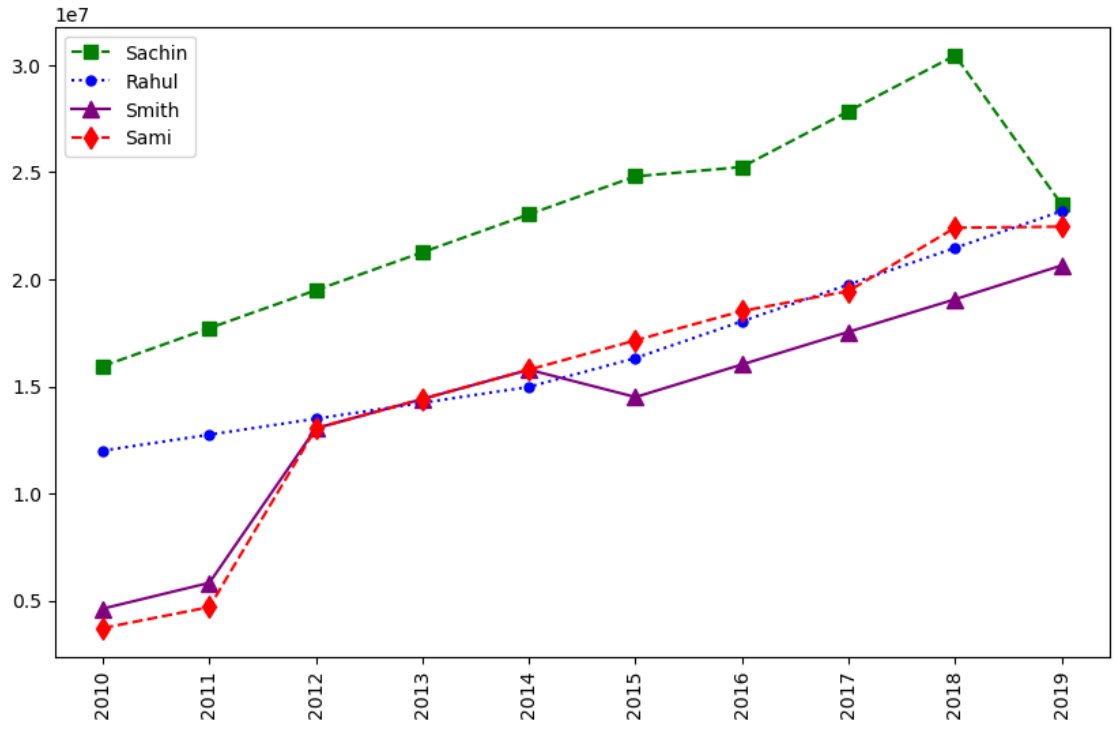
[357]:
```
plt.plot(Salary[0], c='Green', ls = '--', marker = 's', ms = 7, label =␣
 ↪Players[0])
#plt.plot(Salary[1], c='Blue', ls = '-', marker = 'o', ms = 5, label =␣
 ↪Players[1])
plt.plot(Salary[2], c='purple', ls = '--', marker = '^', ms = 8, label =␣
 ↪Players[2])
#plt.plot(Salary[3], c='Red', ls = ':', marker = 'd', ms = 8, label =␣
 ↪Players[3])
plt.xticks(list(range(0,10)), Seasons,rotation='vertical')
plt.show()
```



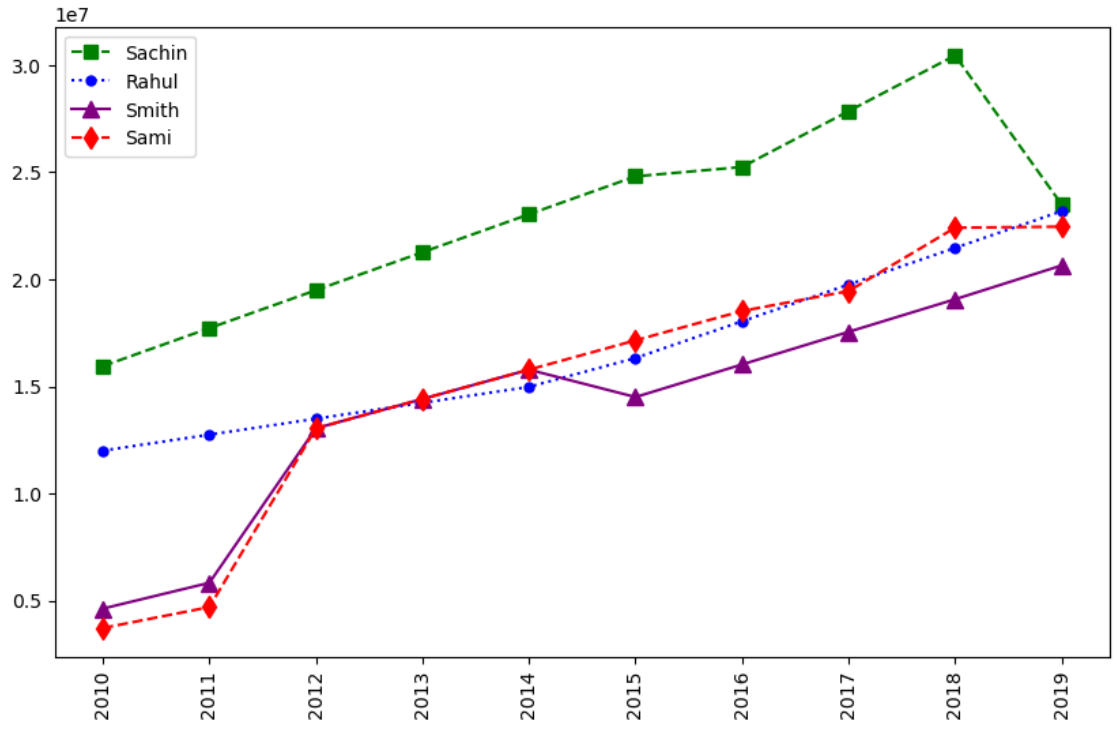
[361]:
```
#plt.plot(Salary[0], c='Green', ls = '--', marker = 's', ms = 7, label =␣
 ↪Players[0])
plt.plot(Salary[1], c='Blue', ls = '-', marker = 'o', ms = 5, label =␣
 ↪Players[1])
#plt.plot(Salary[2], c='purple', ls = '--', marker = '^', ms = 8, label =␣
 ↪Players[2])
plt.plot(Salary[3], c='Red', ls = ':', marker = 'd', ms = 8, label = Players[3])
plt.xticks(list(range(0,10)), Seasons,rotation='vertical')
plt.show()
```



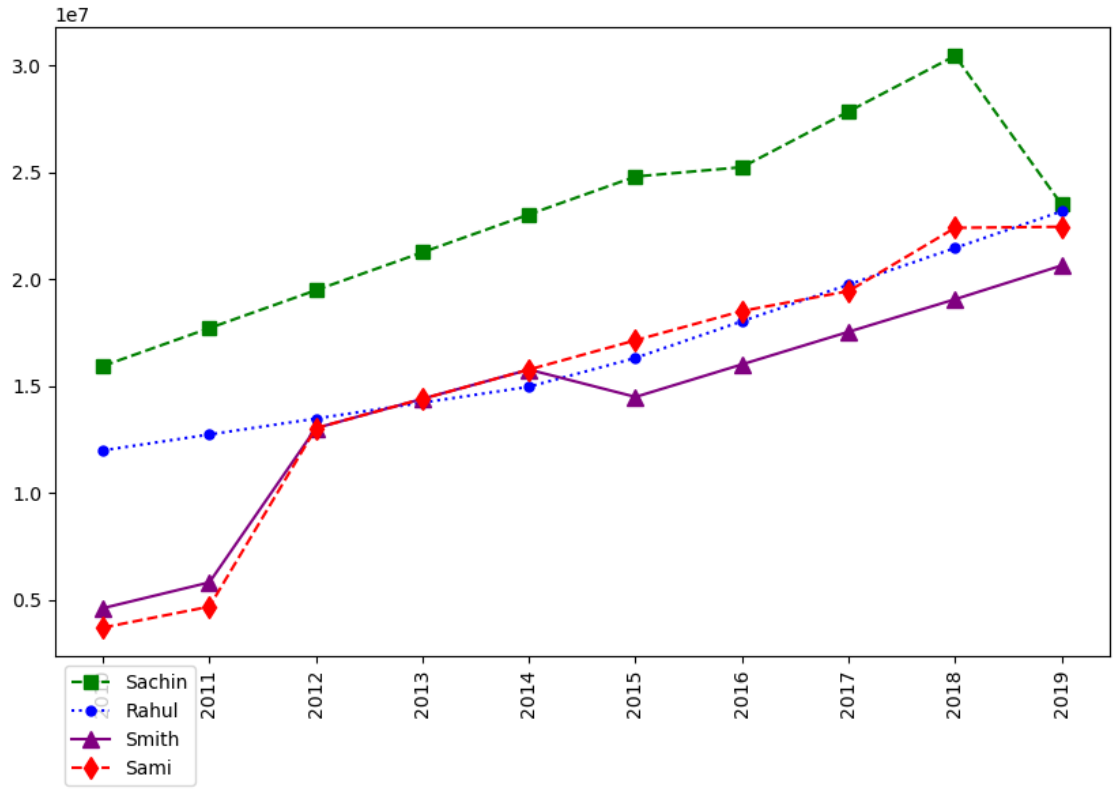
[367]:
```
plt.plot(Salary[0], c='Green', ls = '--', marker = 's', ms = 7, label =␣
 ↪Players[0])
plt.plot(Salary[1], c='Blue', ls = ':', marker = 'o', ms = 5, label =␣
 ↪Players[1])
plt.plot(Salary[2], c='purple', ls = '-', marker = '^', ms = 8, label =␣
 ↪Players[2])
plt.plot(Salary[3], c='Red', ls = '--', marker = 'd', ms = 8, label =␣
 ↪Players[3])
plt.legend()
plt.xticks(list(range(0,10)), Seasons,rotation='vertical')

plt.show()
```



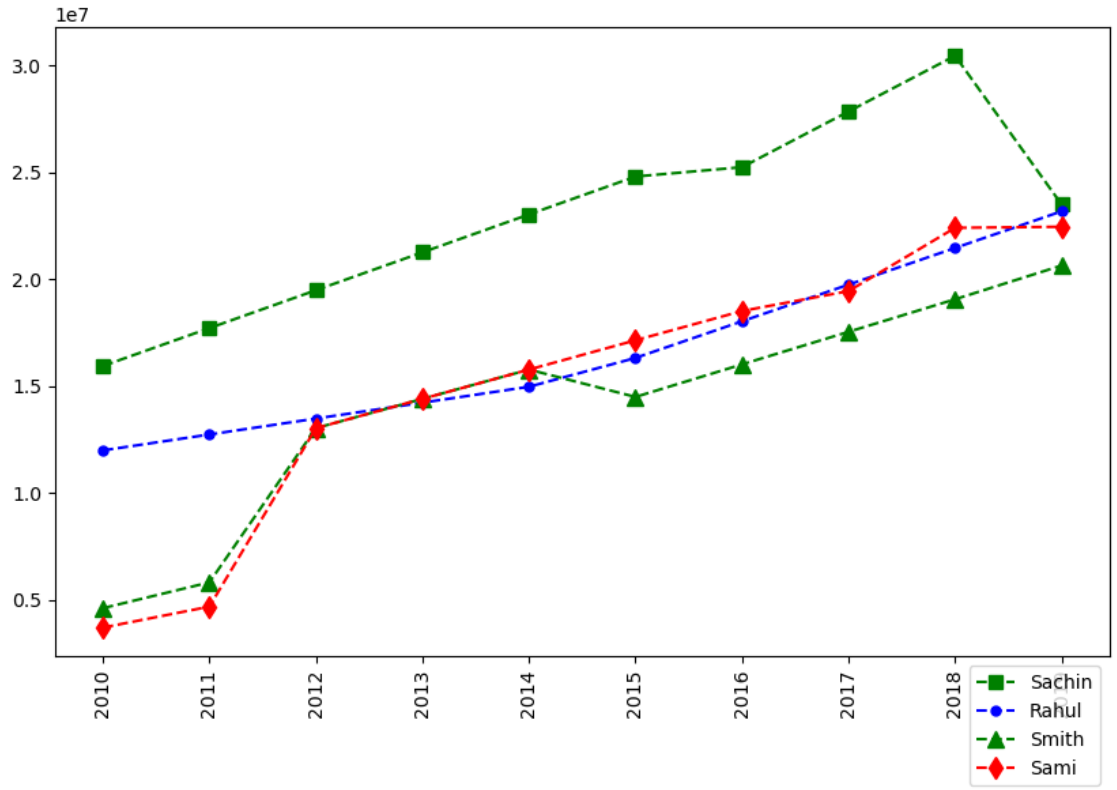
[369]:
```
plt.plot(Salary[0], c='Green', ls = '--', marker = 's', ms = 7, label =␣
 ↪Players[0])
plt.plot(Salary[1], c='Blue', ls = ':', marker = 'o', ms = 5, label =␣
 ↪Players[1])
plt.plot(Salary[2], c='purple', ls = '-', marker = '^', ms = 8, label =␣
 ↪Players[2])
plt.plot(Salary[3], c='Red', ls = '--', marker = 'd', ms = 8, label =␣
 ↪Players[3])
plt.legend(loc='upper left')
plt.xticks(list(range(0,10)), Seasons,rotation='vertical')

plt.show()
```



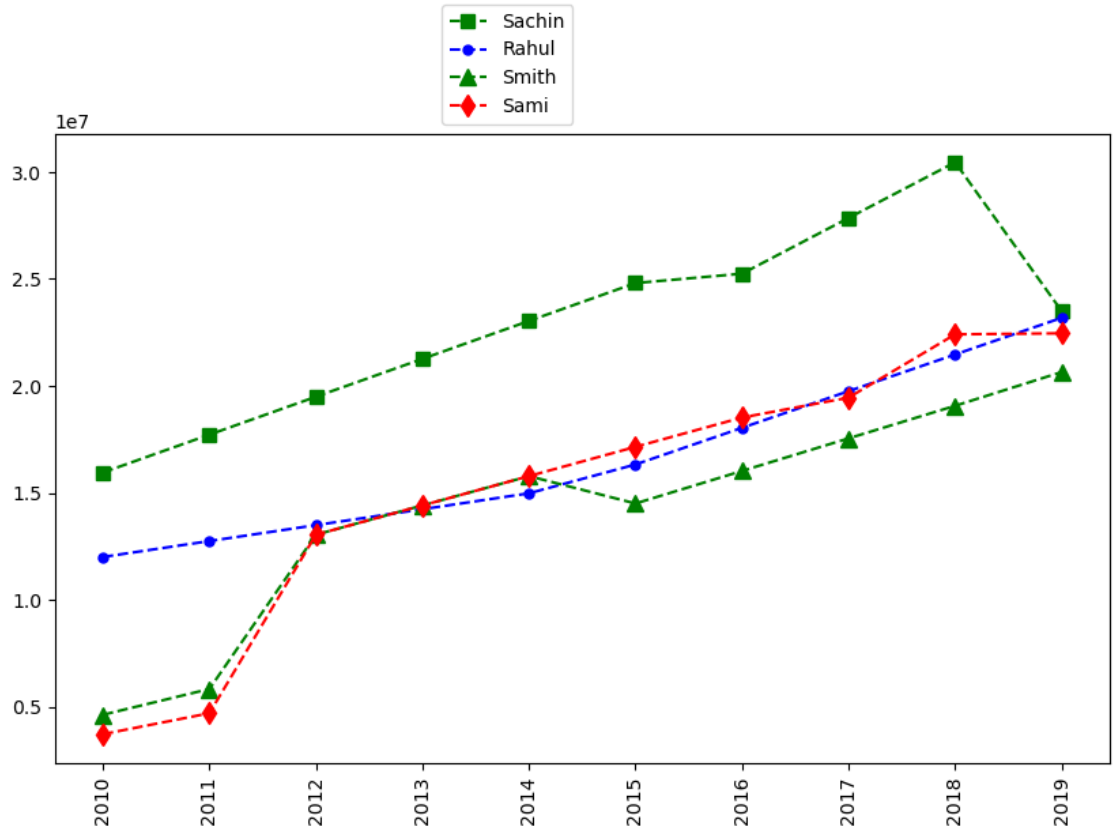
[375]:
```
plt.plot(Salary[0], c='Green', ls = '--', marker = 's', ms = 7, label =␣
 ↪Players[0])
plt.plot(Salary[1], c='Blue', ls = ':', marker = 'o', ms = 5, label =␣
 ↪Players[1])
plt.plot(Salary[2], c='purple', ls = '-', marker = '^', ms = 8, label =␣
 ↪Players[2])
plt.plot(Salary[3], c='Red', ls = '--', 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()
```



[384]:
```
plt.plot(Salary[0], c='Green', ls = '--', marker = 's', ms = 7, label =␣
 ↪Players[0])
plt.plot(Salary[1], c='Blue', ls = '--', marker = 'o', ms = 5, label =␣
 ↪Players[1])
plt.plot(Salary[2], c='Green', ls = '--', marker = '^', ms = 8, label =␣
 ↪Players[2])
plt.plot(Salary[3], c='Red', ls = '--', marker = 'd', ms = 8, label =␣
 ↪Players[3])
plt.legend(loc = 'upper right',bbox_to_anchor=(1,0))
plt.xticks(list(range(0,10)), Seasons,rotation='vertical')

plt.show()
```

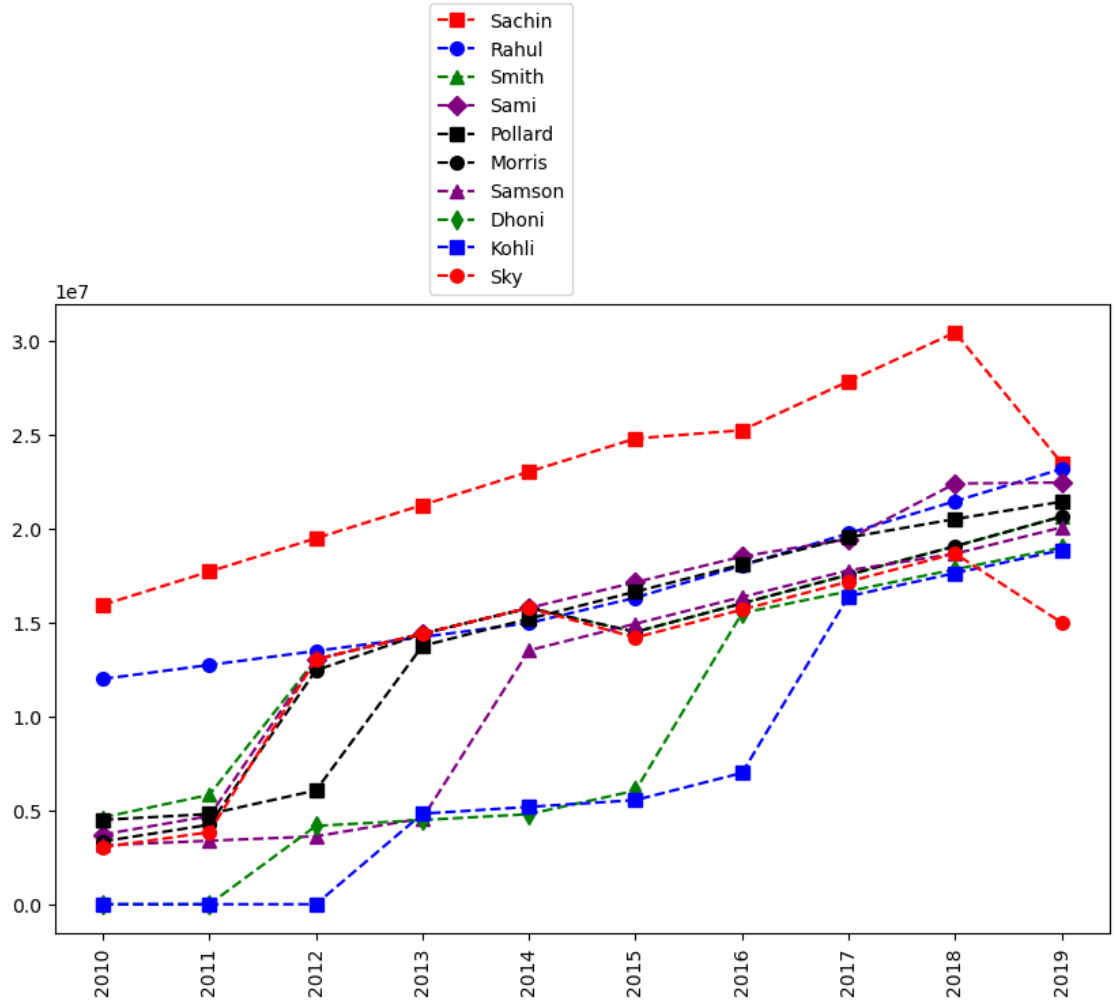


[386]:
```
plt.plot(Salary[0], c='Green', ls = '--', marker = 's', ms = 7, label =␣
 ↪Players[0])
plt.plot(Salary[1], c='Blue', ls = '--', marker = 'o', ms = 5, label =␣
 ↪Players[1])
plt.plot(Salary[2], c='Green', ls = '--', marker = '^', ms = 8, label =␣
 ↪Players[2])
plt.plot(Salary[3], c='Red', ls = '--', marker = 'd', ms = 8, label =␣
 ↪Players[3])
plt.legend(loc = 'lower right',bbox_to_anchor=(0.5,1) )
plt.xticks(list(range(0,10)), Seasons,rotation='vertical')

plt.show()
```



[400]:
```
plt.plot(Salary[0], c='red', 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='Green', ls = '--', marker = '^', ms = 7, label =␣
 ↪Players[2])
plt.plot(Salary[3], c='Purple', ls = '--', marker = 'D', ms = 7, label =␣
 ↪Players[3])
plt.plot(Salary[4], c='Black', ls = '--', marker = 's', ms = 7, label =␣
 ↪Players[4])
plt.plot(Salary[5], c='Black', ls = '--', marker = 'o', ms = 7, label =␣
 ↪Players[5])
plt.plot(Salary[6], c='Purple', ls = '--', marker = '^', ms = 7, label =␣
 ↪Players[6])
plt.plot(Salary[7], c='Green', ls = '--', marker = 'd', ms = 7, label =␣
 ↪Players[7])
plt.plot(Salary[8], c='Blue', ls = '--', marker = 's', ms = 7, label =␣
 ↪Players[8])
plt.plot(Salary[9], c='Red', 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')

plt.show()
```



[ ]: