

```
In [1]: #Import numpy
import numpy as np
```

```
In [2]: #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}
```

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

```
In [4]: #Salaries
Sachin_Salary = [15946875, 17718750, 19490625, 21262500, 23034375, 24806250, 25244493, 278100000, 29618750, 31388375, 33152500, 34925000, 36797500, 38570000, 40342500, 42115000, 43887500]
Rahul_Salary = [12000000, 12744189, 13488377, 14232567, 14976754, 16324500, 18038573, 19750000, 21492250, 23250000, 25000000, 26750000, 28500000, 30250000, 32000000, 33750000, 35500000, 37250000]
Smith_Salary = [4621800, 5828090, 13041250, 14410581, 15779912, 14500000, 16022500, 17545000, 19090000, 2061274, 22150000, 23758000, 25305000, 26832500, 28360000, 30887500, 32415000, 34942500, 36470000]
Sami_Salary = [3713640, 4694041, 13041250, 14410581, 15779912, 17149243, 18518574, 19450000, 2091770, 22445000, 24000000, 25545000, 27100000, 28645000, 3019200, 31741443, 33041250, 34410581, 35779912, 37149243, 38518574, 39450000]
Pollard_Salary = [4493160, 4806720, 6061274, 13758000, 15202590, 16647180, 18091770, 19536000, 21090000, 2261274, 24150000, 25779912, 27325000, 28862875, 3041920, 3194480, 33041250, 34410581, 35779912, 37149243, 38518574, 39450000]
Morris_Salary = [3348000, 4235220, 12455000, 14410581, 15779912, 14500000, 16022500, 17545000, 19090000, 2061274, 22150000, 23758000, 25305000, 26832500, 28360000, 30887500, 32415000, 34942500, 36470000]
Samson_Salary = [3144240, 3380160, 3615960, 4574189, 13520500, 14940153, 16359805, 17779450, 1921770, 20745000, 22282500, 23810000, 25347500, 26875000, 28412500, 30040000, 316669630, 332627, 34896880, 36053663, 375506632, 3916669630, 407832627, 421899]
Dhoni_Salary = [0, 0, 4171200, 4484040, 4796880, 6053663, 15506632, 16669630, 17832627, 18990000, 2053663, 22669630, 247832627, 26896880, 2853663, 3016669630, 317832627, 331899]
Kohli_Salary = [0, 0, 0, 4822800, 5184480, 5546160, 6993708, 16402500, 17632688, 18862875]
Sky_Salary = [3031920, 3841443, 13041250, 14410581, 15779912, 14200000, 15691000, 17182000]
```

```
In [7]: #Matrix
Salary = np.array([Sachin_Salary, Rahul_Salary, Smith_Salary, Sami_Salary, Pollard_Salary, Morris_Salary, Samson_Salary, Dhoni_Salary, Kohli_Salary, Sky_Salary])
```

```
In [8]: #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]
```

```
In [9]: #Matrix
Games = np.array([Sachin_G, Rahul_G, Smith_G, Sami_G, Pollard_G, Morris_G, Samson_G, Dhoni_G, Kohli_G, Sky_G])
```

```
In [10]: #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]
```

```
In [11]: #Matrix
Points = np.array([Sachin PTS, Rahul PTS, Smith PTS, Sami PTS, Pollard PTS, Morris_
```

```
In [12]: Salary # matrix format
```

```
Out[12]: 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 [13]: # Building your first matrix -
Games
```

```
Out[13]: 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 [14]: Points
```

```
Out[14]: 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 [15]: Games[5]
```

```
Out[15]: array([70, 69, 67, 77, 70, 77, 57, 74, 79, 44])
```

```
In [16]: Games[0:5]
```

```
Out[16]: array([[80, 77, 82, 82, 73, 82, 58, 78, 6, 35],  
                 [82, 57, 82, 79, 76, 72, 60, 72, 79, 80],  
                 [79, 78, 75, 81, 76, 79, 62, 76, 77, 69],  
                 [80, 65, 77, 66, 69, 77, 55, 67, 77, 40],  
                 [82, 82, 82, 79, 82, 78, 54, 76, 71, 41]])
```

```
In [17]: Games[0:5]
```

```
Out[17]: 82
```

```
In [18]: Games[0,2]
```

```
Out[18]: 82
```

```
In [19]: Games
```

```
Out[19]: 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 [20]: Games[2,8]
```

```
Out[20]: 77
```

```
In [21]: Games
```

```
Out[21]: 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 [22]: Games[-3:-1]
```

```
Out[22]: array([[35, 35, 80, 74, 82, 78, 66, 81, 81, 27],  
                 [40, 40, 40, 81, 78, 81, 39, 0, 10, 51]])
```

```
In [23]: Points
```

```
Out[23]: array([[2832, 2430, 2323, 2201, 1970, 2078, 1616, 2133, 83, 782],  
[1653, 1426, 1779, 1688, 1619, 1312, 1129, 1170, 1245, 1154],  
[2478, 2132, 2250, 2304, 2258, 2111, 1683, 2036, 2089, 1743],  
[2122, 1881, 1978, 1504, 1943, 1970, 1245, 1920, 2112, 966],  
[1292, 1443, 1695, 1624, 1503, 1784, 1113, 1296, 1297, 646],  
[1572, 1561, 1496, 1746, 1678, 1438, 1025, 1232, 1281, 928],  
[1258, 1104, 1684, 1781, 841, 1268, 1189, 1186, 1185, 1564],  
[903, 903, 1624, 1871, 2472, 2161, 1850, 2280, 2593, 686],  
[597, 597, 597, 1361, 1619, 2026, 852, 0, 159, 904],  
[2040, 1397, 1254, 2386, 2045, 1941, 1082, 1463, 1028, 1331]])
```

```
In [24]: Points[0]
```

```
Out[24]: array([2832, 2430, 2323, 2201, 1970, 2078, 1616, 2133, 83, 782])
```

```
In [25]: Points[:]
```

```
Out[25]: 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 [26]: Points[6,1]
```

```
Out[26]: 1104
```

```
In [27]: Points[6,1]
```

```
Out[27]: 1104
```

```
In [28]: Points[3:6]
```

```
Out[28]: array([[2122, 1881, 1978, 1504, 1943, 1970, 1245, 1920, 2112, 966],  
[1292, 1443, 1695, 1624, 1503, 1784, 1113, 1296, 1297, 646],  
[1572, 1561, 1496, 1746, 1678, 1438, 1025, 1232, 1281, 928]])
```

```
In [29]: Points
```

```
Out[29]: 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 [30]: Points[-6, -1]
```

```
Out[30]: 646
```

```
In [31]: Games
```

```
Out[31]: 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 [32]: Pdict
```

```
Out[32]: {'Sachin': 0,  
'Rahul': 1,  
'Smith': 2,  
'Sami': 3,  
'Pollard': 4,  
'Morris': 5,  
'Samson': 6,  
'Dhoni': 7,  
'Kohli': 8,  
'Sky': 9}
```

```
In [33]: Pdict['Sachin']
```

```
Out[33]: 0
```

```
In [34]: Games[0]
```

```
Out[34]: array([80, 77, 82, 82, 73, 82, 58, 78, 6, 35])
```

```
In [35]: Games[Pdict['Sachin']]
```

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

```
In [36]: Games
```

```
Out[36]: 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 [37]: Pdict['Rahul']
```

```
Out[37]: 1
```

```
In [38]: Games[1]
```

```
Out[38]: array([82, 57, 82, 79, 76, 72, 60, 72, 79, 80])
```

## Games

```
In [39]: Points
```

```
Out[39]: 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 [40]: Salary
```

```
Out[40]: 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 [41]: Salary[2,4]
```

```
Out[41]: 15779912
```

```
In [42]: Salary
```

```
Out[42]: 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 [43]: Games

```
Out[43]: 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 [44]: Salary/Games

```
C:\Users\Somya\AppData\Local\Temp\ipykernel_8400\3709746658.py:1: RuntimeWarning: divide by zero encountered in divide
  Salary/Games
```

```
Out[44]: 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 [45]: np.round(Salary/Games)
```

```
C:\Users\Somya\AppData\Local\Temp\ipykernel_8400\3232172828.py:1: RuntimeWarning: divide by zero encountered in divide
np.round(Salary/Games)
```

```
Out[45]: 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 [46]: import warnings
warnings.filterwarnings('ignore')
#np.round(FieldGoals/Games)
#FieldGoals/Games
#This matrix is lot of decimal points you can not round
```

```
In [47]: ## ---- First visualization ----##
```

```
In [49]: import numpy as np
import matplotlib.pyplot as plt
```

```
In [53]: %matplotlib inline
```

```
In [54]: Salary
```

```
Out[54]: 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 [55]: Salary[0]
```

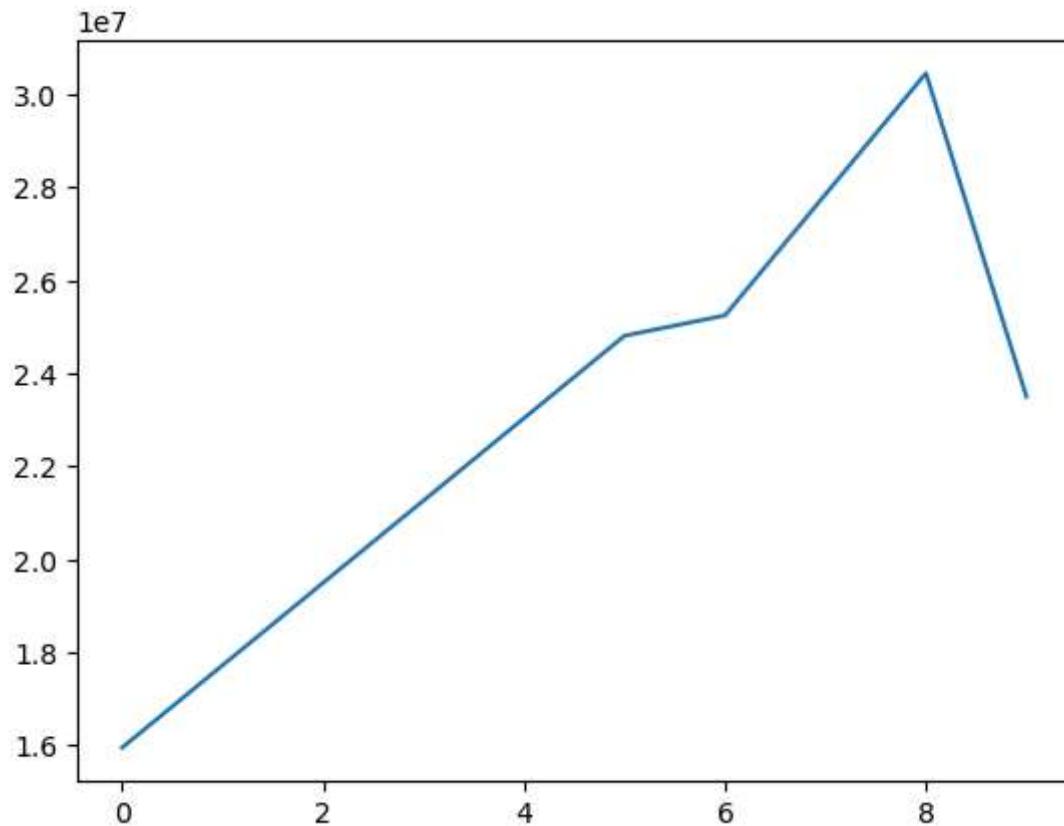
```
Out[55]: array([15946875, 17718750, 19490625, 21262500, 23034375, 24806250,
   25244493, 27849149, 30453805, 23500000])
```

```
In [56]: Pdict
```

```
Out[56]: {'Sachin': 0,
   'Rahul': 1,
   'Smith': 2,
   'Sami': 3,
   'Pollard': 4,
   'Morris': 5,
   'Samson': 6,
   'Dhoni': 7,
   'Kohli': 8,
   'Sky': 9}
```

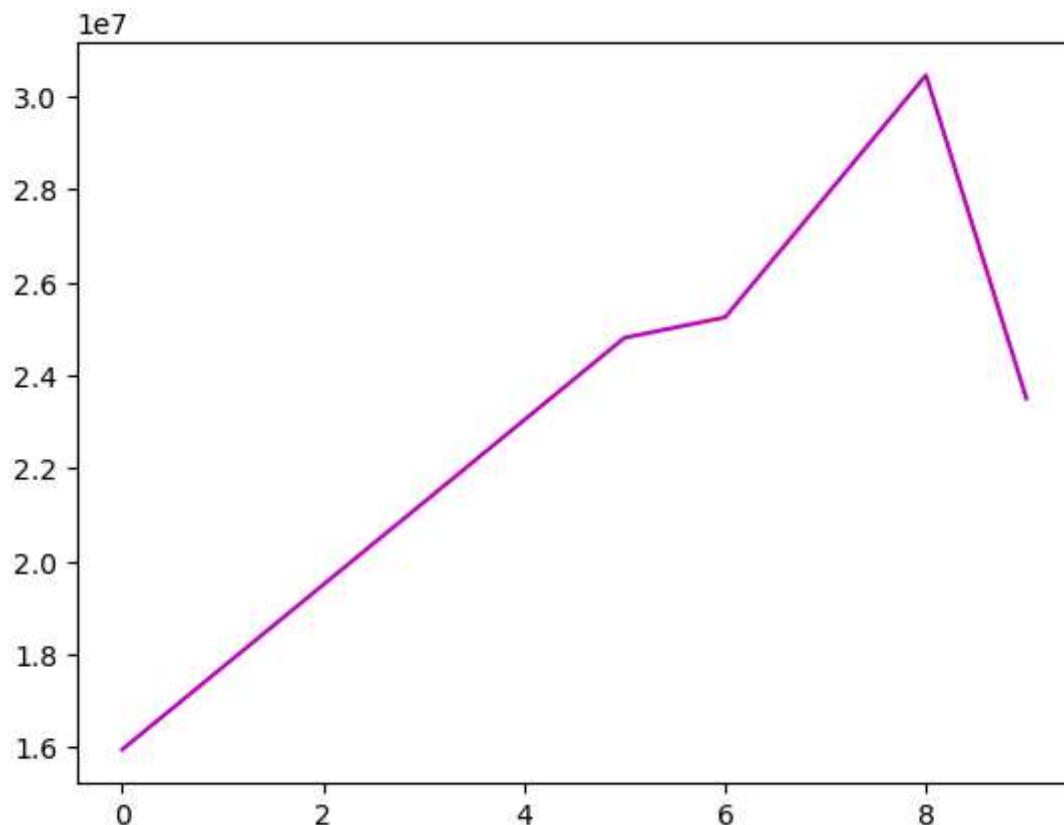
```
In [57]: plt.plot(Salary[0])
```

```
Out[57]: [
```



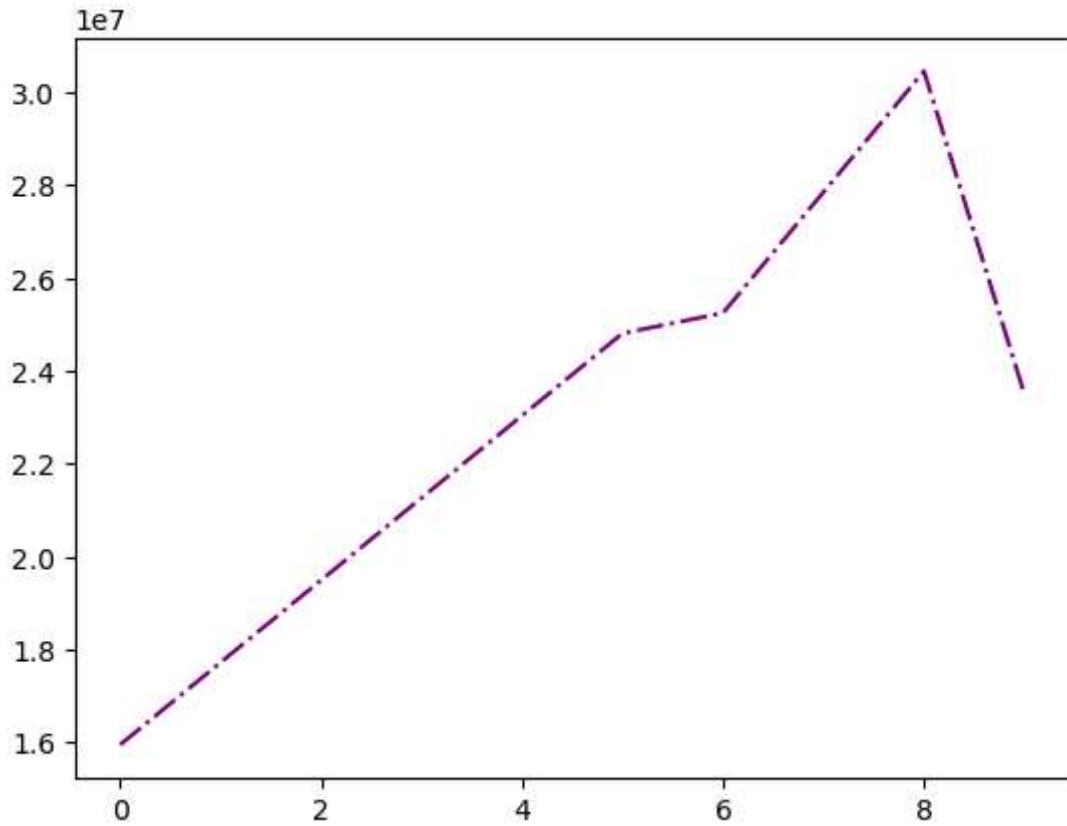
```
In [60]: plt.plot(Salary[0], c='r',)
```

```
Out[60]: []
```



```
In [65]: plt.plot(Salary[0], c='purple', ls = '-.')
```

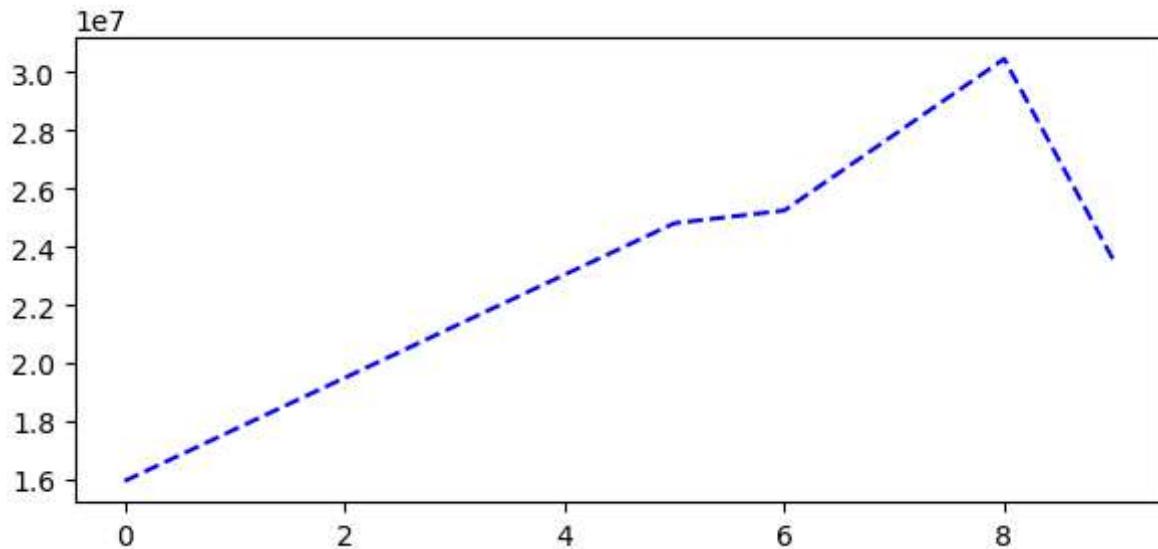
```
Out[65]: <matplotlib.lines.Line2D at 0x22691626390>
```



```
In [67]: %matplotlib inline  
plt.rcParams['figure.figsize'] = 7,3 # 8 - width, 3 - height
```

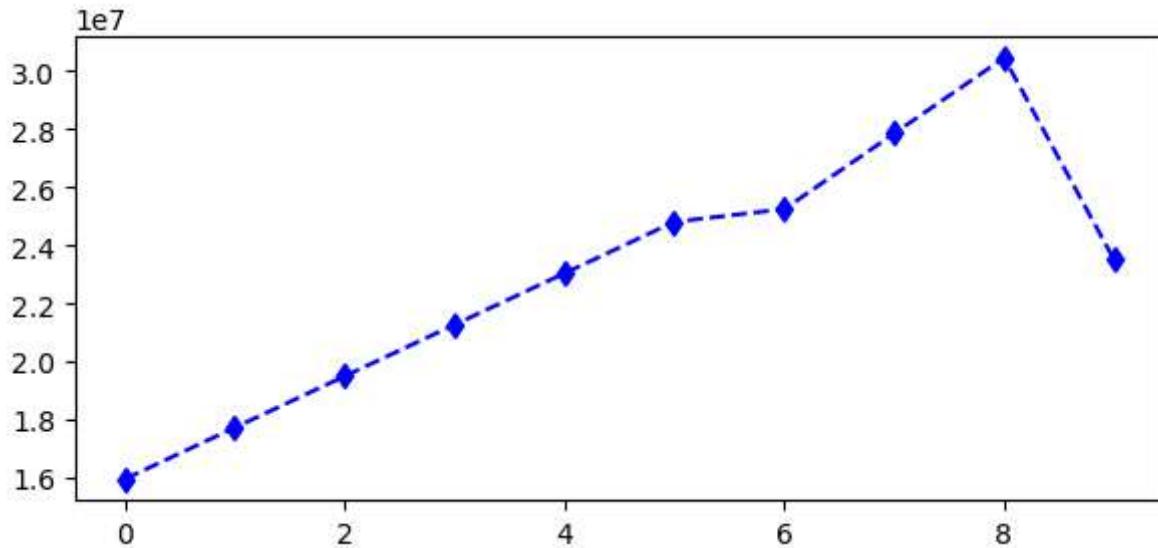
```
In [68]: plt.plot(Salary[0], c='Blue', ls = '--')
```

```
Out[68]: <matplotlib.lines.Line2D at 0x226916da190>
```



```
In [75]: plt.plot(Salary[0], c='Blue', ls = '--', marker = 'd') # D - squares
```

```
Out[75]: <matplotlib.lines.Line2D at 0x226915cfaf0>
```

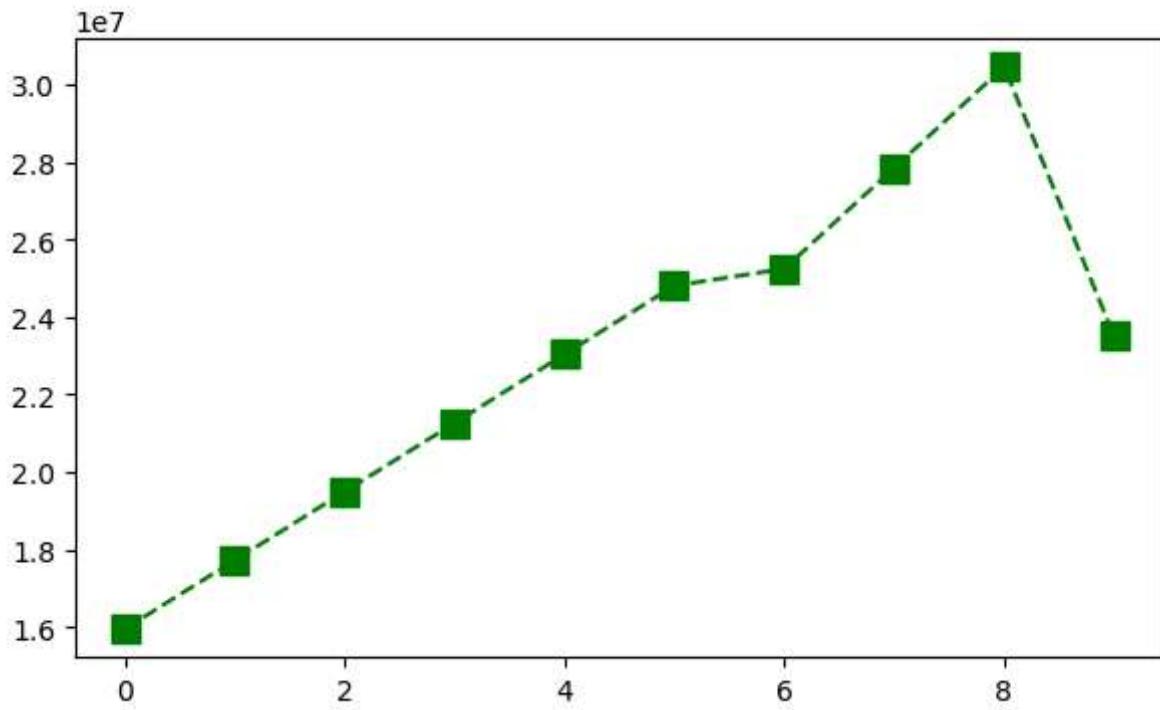


```
In [76]: Games
```

```
Out[76]: 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 [77]: %matplotlib inline
plt.rcParams['figure.figsize'] = 7,4 #runtime configuration parameter
```

```
In [84]: plt.plot(Salary[0], c='Green', ls = '--', marker = 's', ms = 10)
plt.show()
```



```
In [79]: list(range(0,10))
```

```
Out[79]: [0, 1, 2, 3, 4, 5, 6, 7, 8, 9]
```

```
In [80]: Sdict
```

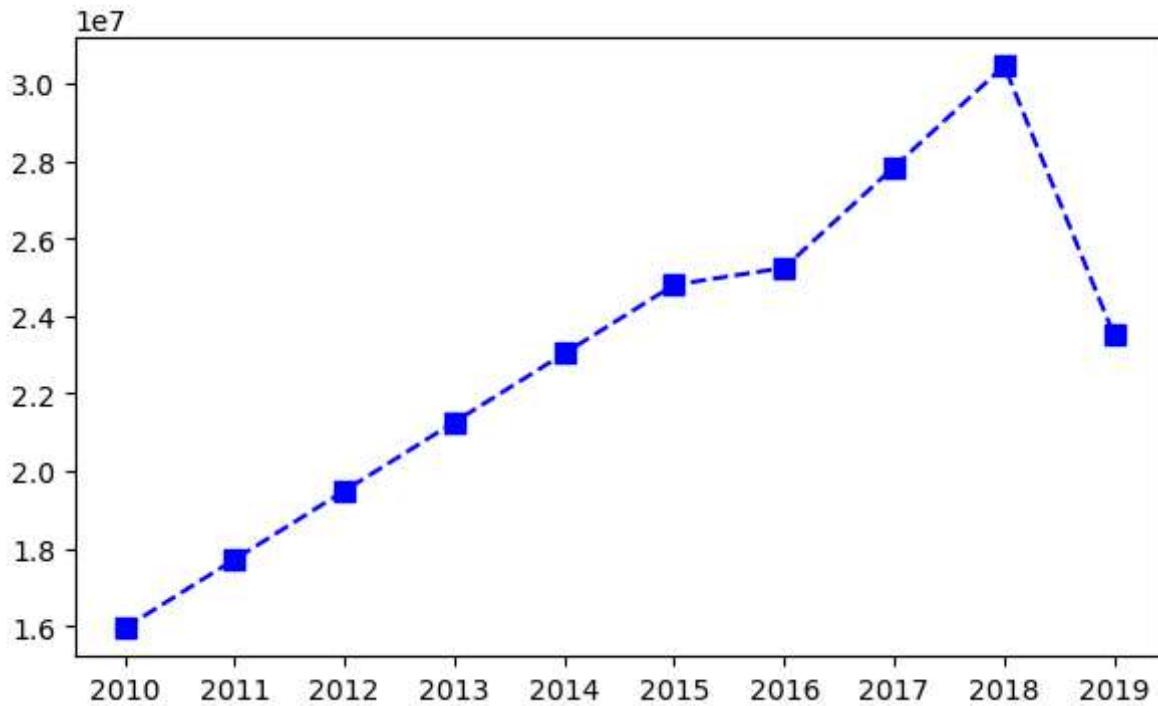
```
Out[80]: {'2010': 0,
          '2011': 1,
          '2012': 2,
          '2013': 3,
          '2014': 4,
          '2015': 5,
          '2016': 6,
          '2017': 7,
          '2018': 8,
          '2019': 9}
```

```
In [81]: Pdict
```

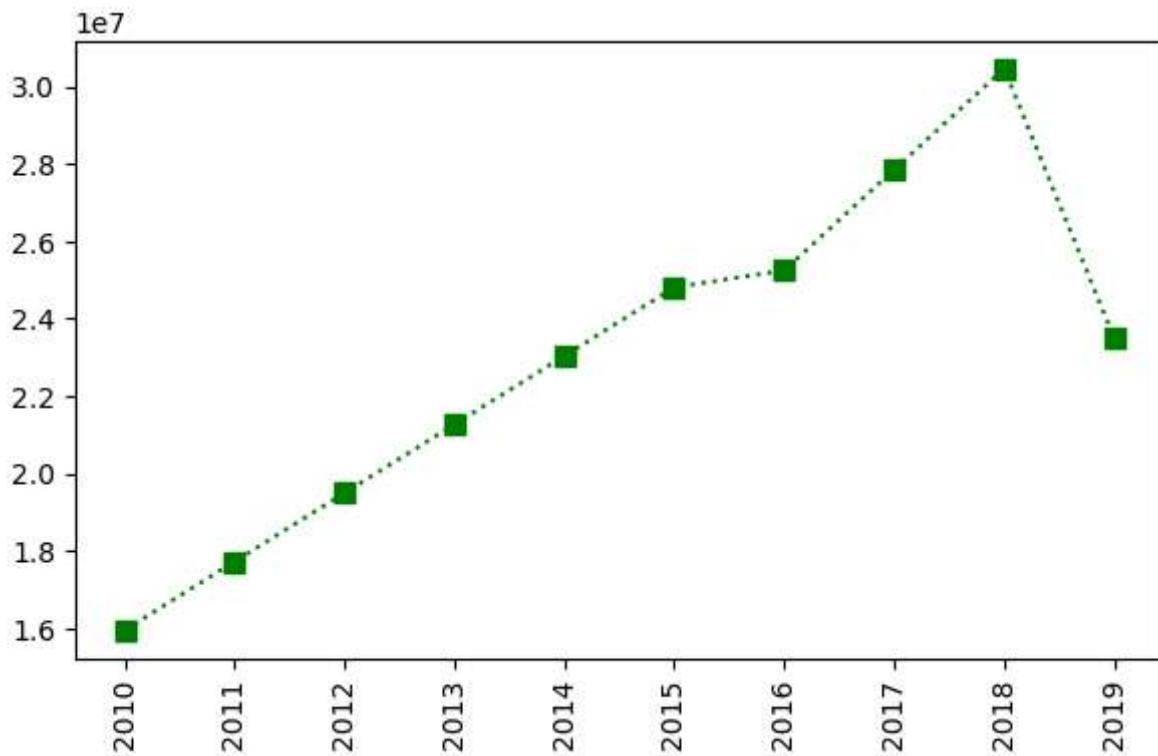
```
Out[81]: {'Sachin': 0,
          'Rahul': 1,
          'Smith': 2,
          'Sami': 3,
          'Pollard': 4,
          'Morris': 5,
          'Samson': 6,
          'Dhoni': 7,
          'Kohli': 8,
          'Sky': 9}
```

```
In [86]: plt.plot(Salary[0], c='blue', ls = '--', marker = 's', ms = 7)
plt.xticks(list(range(0,10)),Seasons)
plt.show()
```

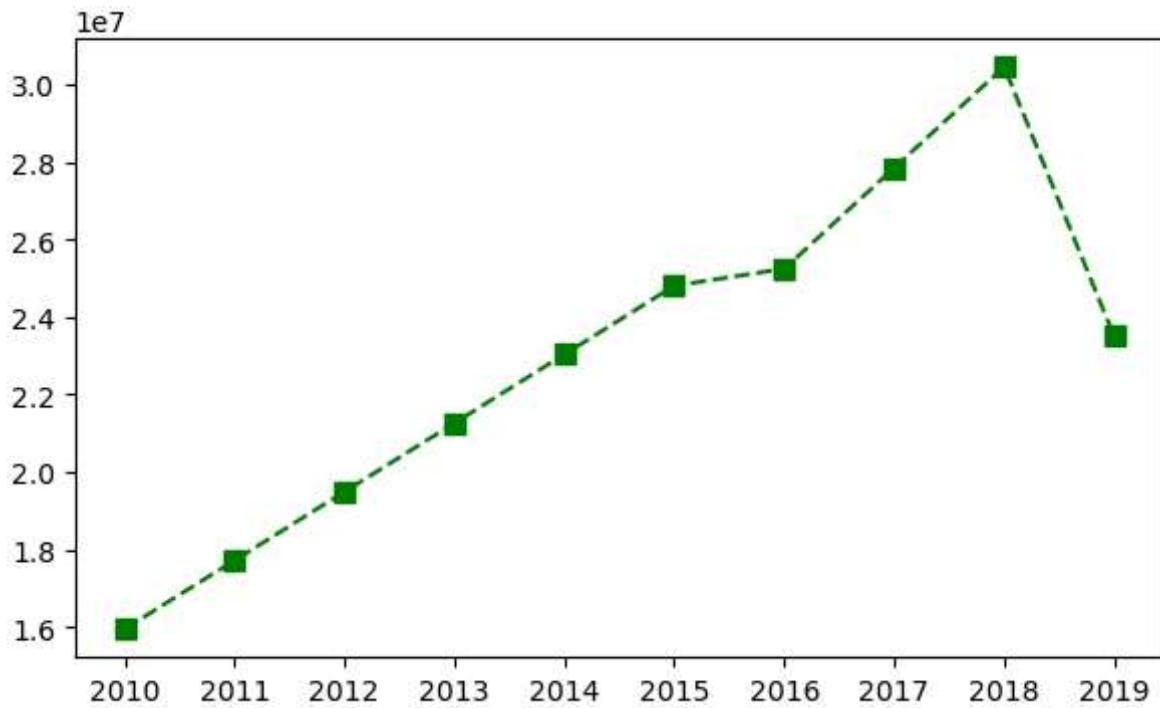
```
Out[86]: <function matplotlib.pyplot.show(close=None, block=None)>
```



```
In [88]: plt.plot(Salary[0], c='green', ls = ':', marker = 's', ms = 7, label = Players[0])
plt.xticks(list(range(0,10)),Seasons,rotation='vertical')
plt.show()
```



```
In [89]: plt.plot(Salary[0], c='green', ls = '--', marker = 's', ms = 7, label = Players[0])
plt.xticks(list(range(0,10)),Seasons,rotation='horizontal')
plt.show()
```



```
In [90]: Salary[0]
```

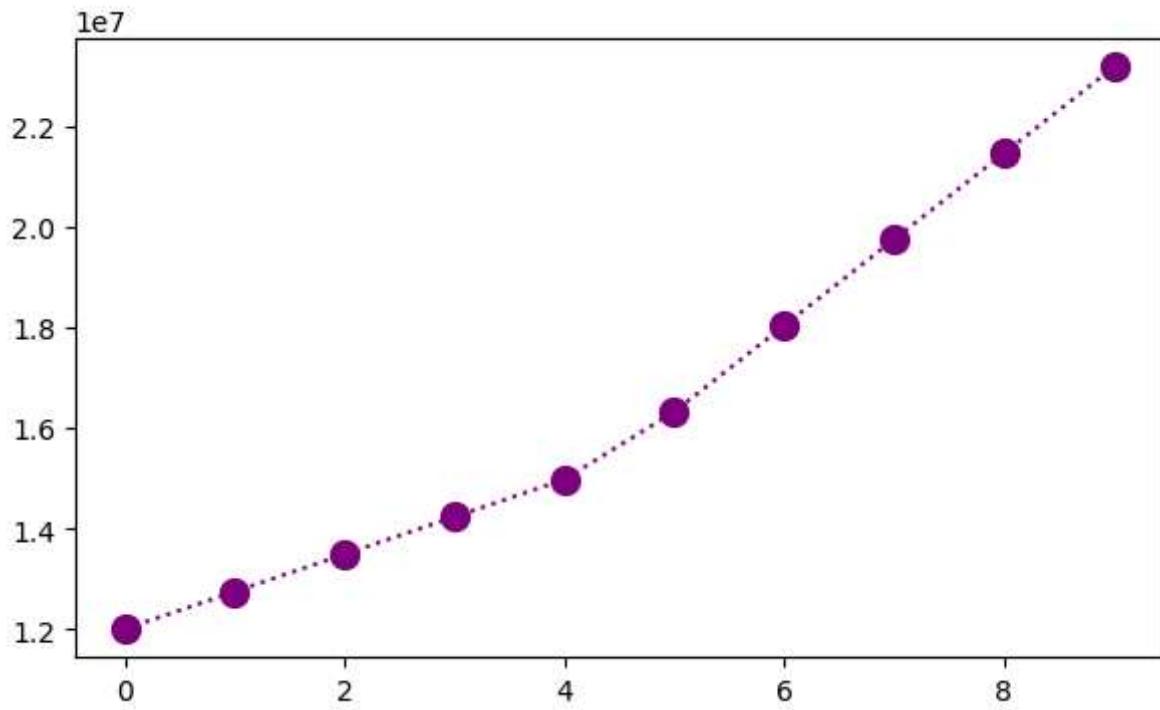
```
Out[90]: array([15946875, 17718750, 19490625, 21262500, 23034375, 24806250,
   25244493, 27849149, 30453805, 23500000])
```

```
In [91]: Salary[1]
```

```
Out[91]: array([12000000, 12744189, 13488377, 14232567, 14976754, 16324500,
   18038573, 19752645, 21466718, 23180790])
```

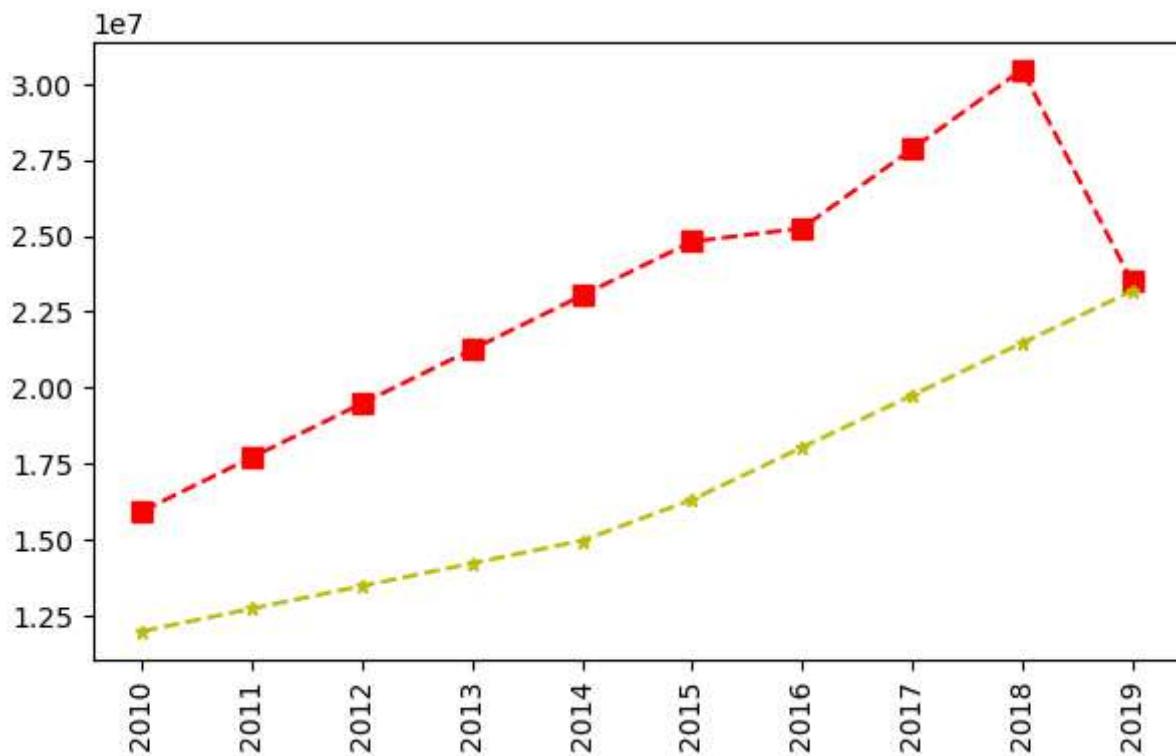
```
In [92]: plt.plot(Salary[1], c='purple', ls = ':', marker = 'o', ms = 10, label = Players[1])
```

```
Out[92]: [<matplotlib.lines.Line2D at 0x226925caad0>]
```



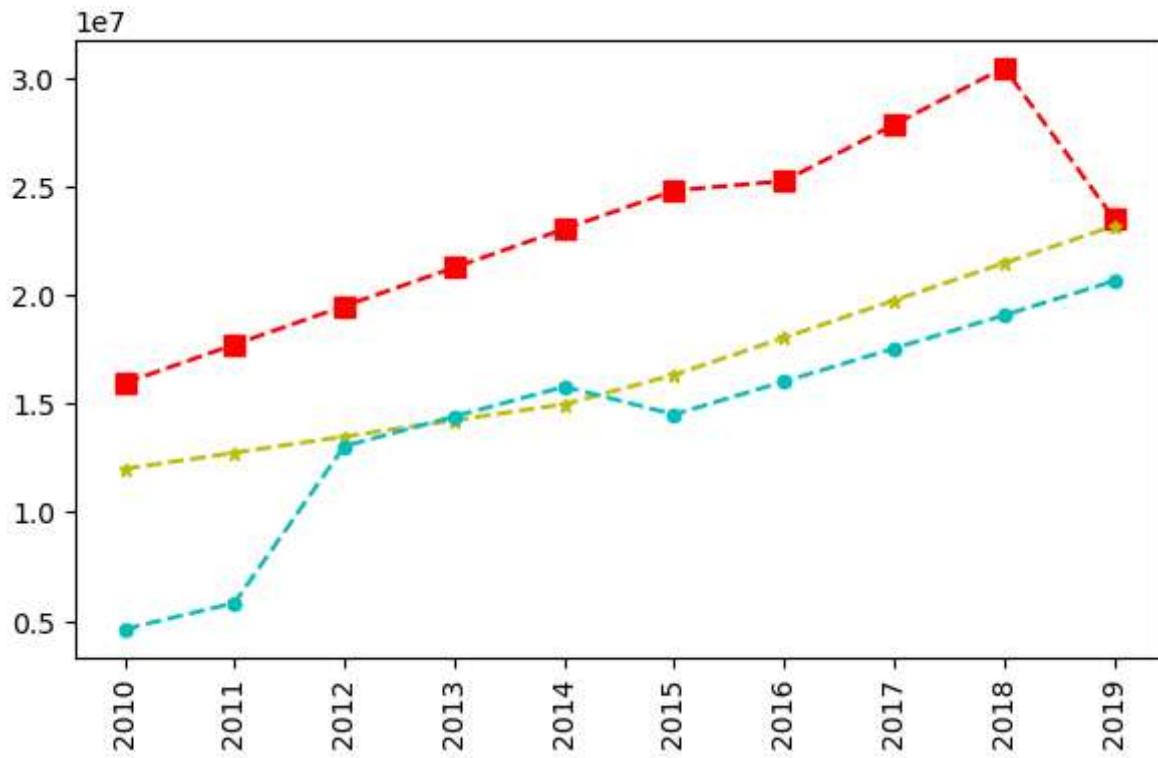
```
In [93]: # more visualization
```

```
In [95]: plt.plot(Salary[0], c='r', ls = '--', marker = 's', ms = 7, label = Players[0])
plt.plot(Salary[1], c='y', ls = '--', marker = '*', ms = 5, label = Players[1])
plt.xticks(list(range(0,10)), Seasons, rotation='vertical')
plt.show()
```

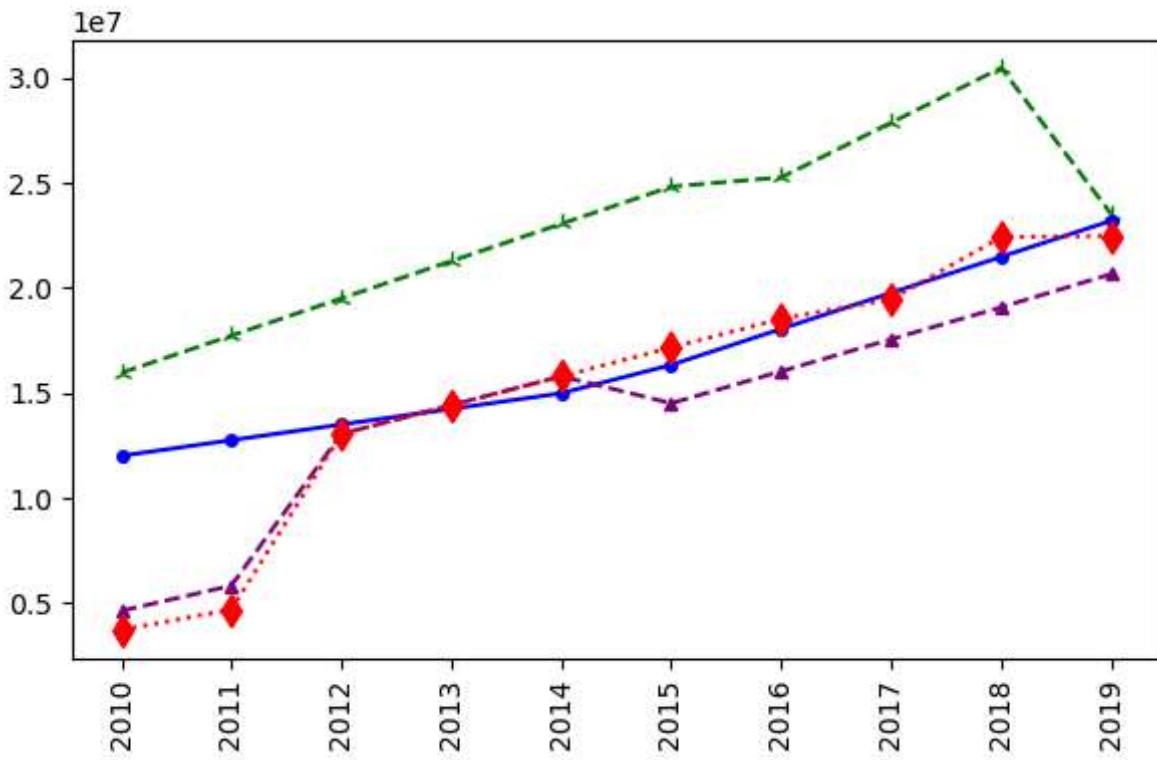


```
In [96]: plt.plot(Salary[0], c='r', ls = '--', marker = 's', ms = 7, label = Players[0])
plt.plot(Salary[1], c='y', ls = '--', marker = '*', ms = 5, label = Players[1])
```

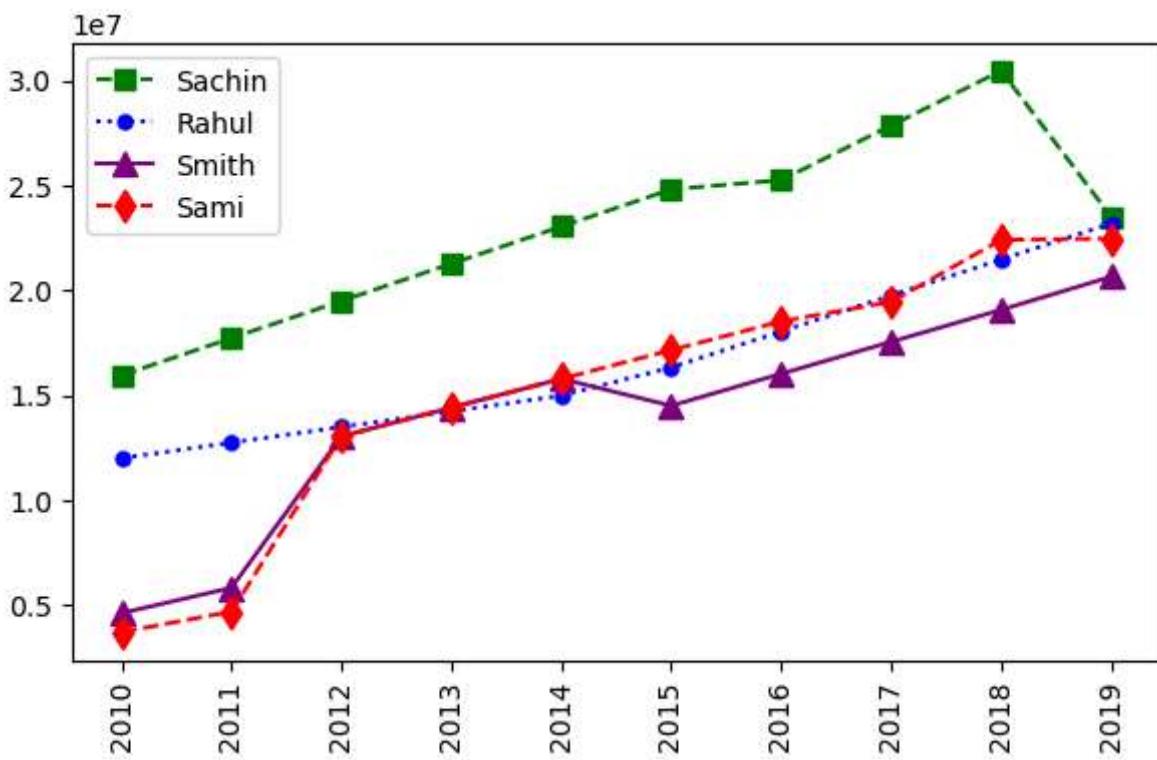
```
plt.plot(Salary[2], c='c', ls = '--', marker = '.', ms = 9, label = Players[2])
plt.xticks(list(range(0,10)), Seasons, rotation='vertical')
plt.show()
```



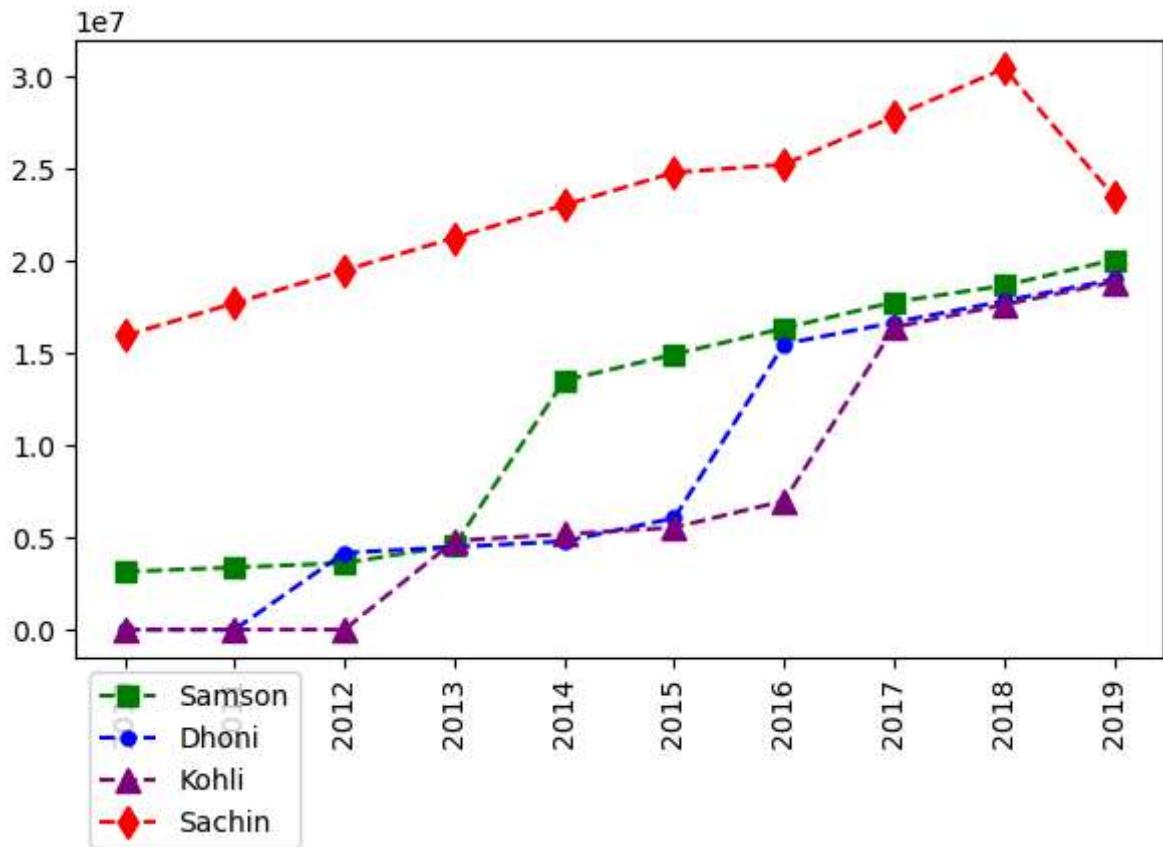
```
In [97]: plt.plot(Salary[0], c='Green', ls = '--', marker = '2', ms = 7, label = Players[0])
plt.plot(Salary[1], c='Blue', ls = '-.', marker = 'o', ms = 4, label = Players[1])
plt.plot(Salary[2], c='purple', ls = '--', marker = '^', ms = 4, label = Players[2])
plt.plot(Salary[3], c='Red', ls = ':', marker = 'd', ms = 8, label = Players[3])
plt.xticks(list(range(0,10)), Seasons, rotation='vertical')
plt.show()
```



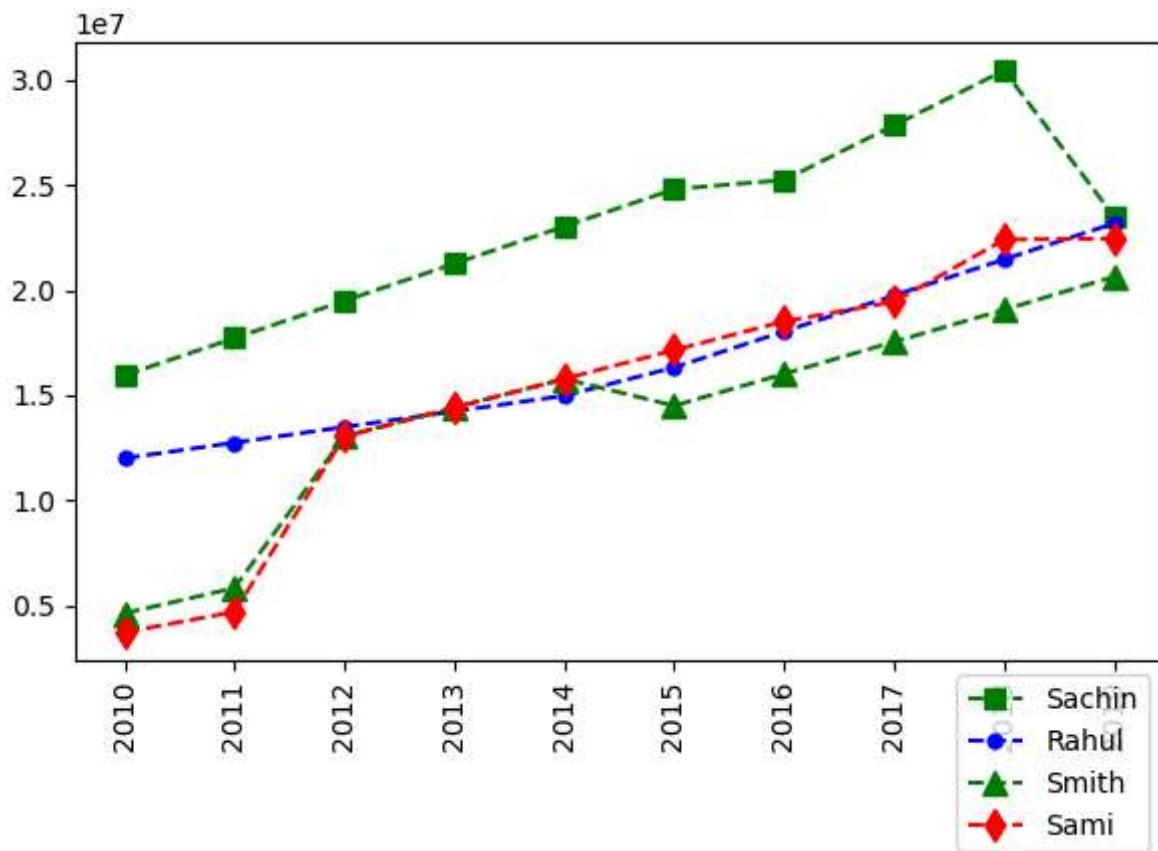
```
In [98]: # how to add legend in visualisation
plt.plot(Salary[0], c='Green', ls = '--', marker = 's', ms = 7, label = Players[0])
plt.plot(Salary[1], c='Blue', ls = ':', marker = 'o', ms = 5, label = Players[1])
plt.plot(Salary[2], c='purple', ls = '-.', marker = '^', ms = 8, label = Players[2])
plt.plot(Salary[3], c='Red', ls = '---', marker = 'd', ms = 8, label = Players[3])
plt.legend()
plt.xticks(list(range(0,10)), Seasons, rotation='vertical')
plt.show()
```



```
In [99]: plt.plot(Salary[6], c='Green', ls = '--', marker = 's', ms = 7, label = Players[6])
plt.plot(Salary[7], c='Blue', ls = '--', marker = 'o', ms = 5, label = Players[7])
plt.plot(Salary[8], c='purple', ls = '--', marker = '^', ms = 8, label = Players[8])
plt.plot(Salary[0], c='Red', ls = '--', marker = 'd', ms = 8, label = Players[0])
plt.legend(loc = 'upper left',bbox_to_anchor=(0,0) )
plt.xticks(list(range(0,10)), Seasons,rotation='vertical')
plt.show()
```

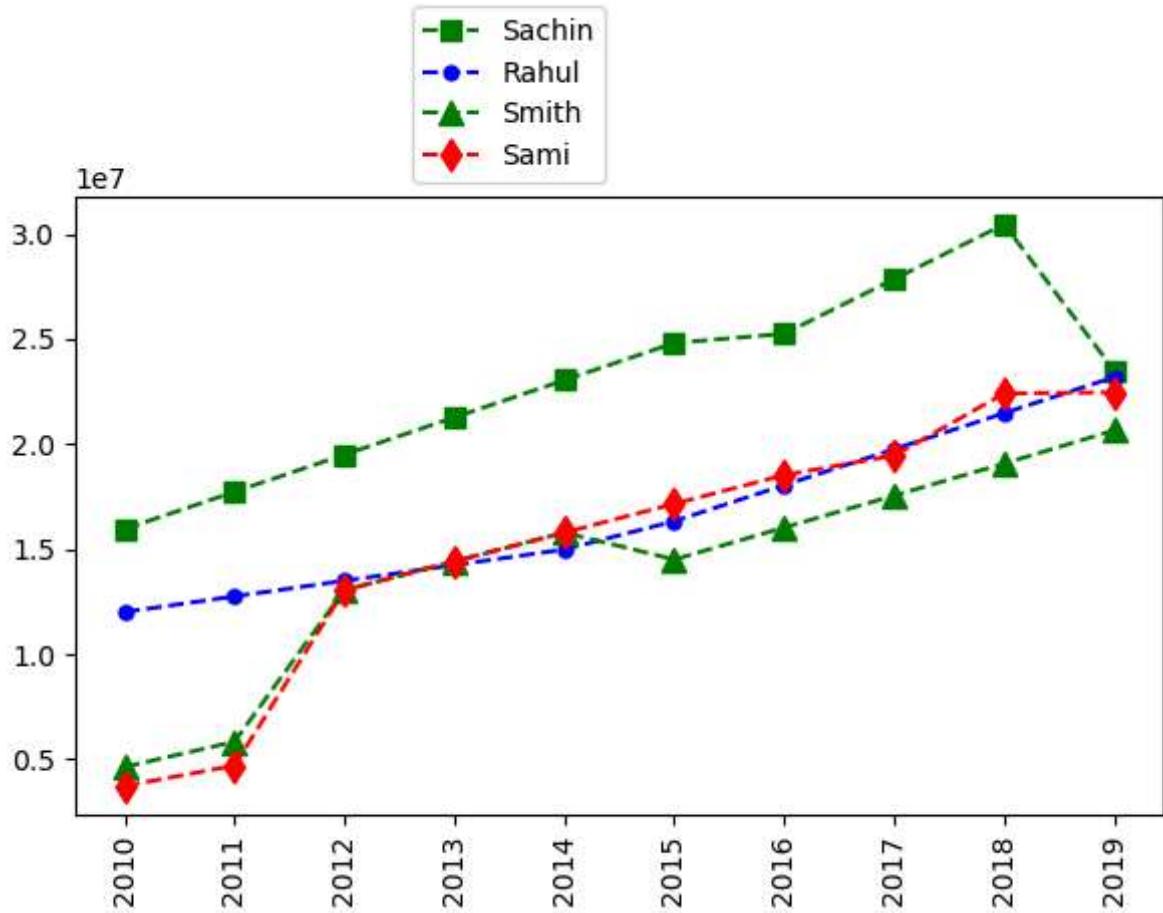


```
In [100]: plt.plot(Salary[0], c='Green', ls = '--', marker = 's', ms = 7, label = Players[0])
plt.plot(Salary[1], c='Blue', ls = '--', marker = 'o', ms = 5, label = Players[1])
plt.plot(Salary[2], c='Green', ls = '--', marker = '^', ms = 8, label = Players[2])
plt.plot(Salary[3], c='Red', ls = '--', 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()
```

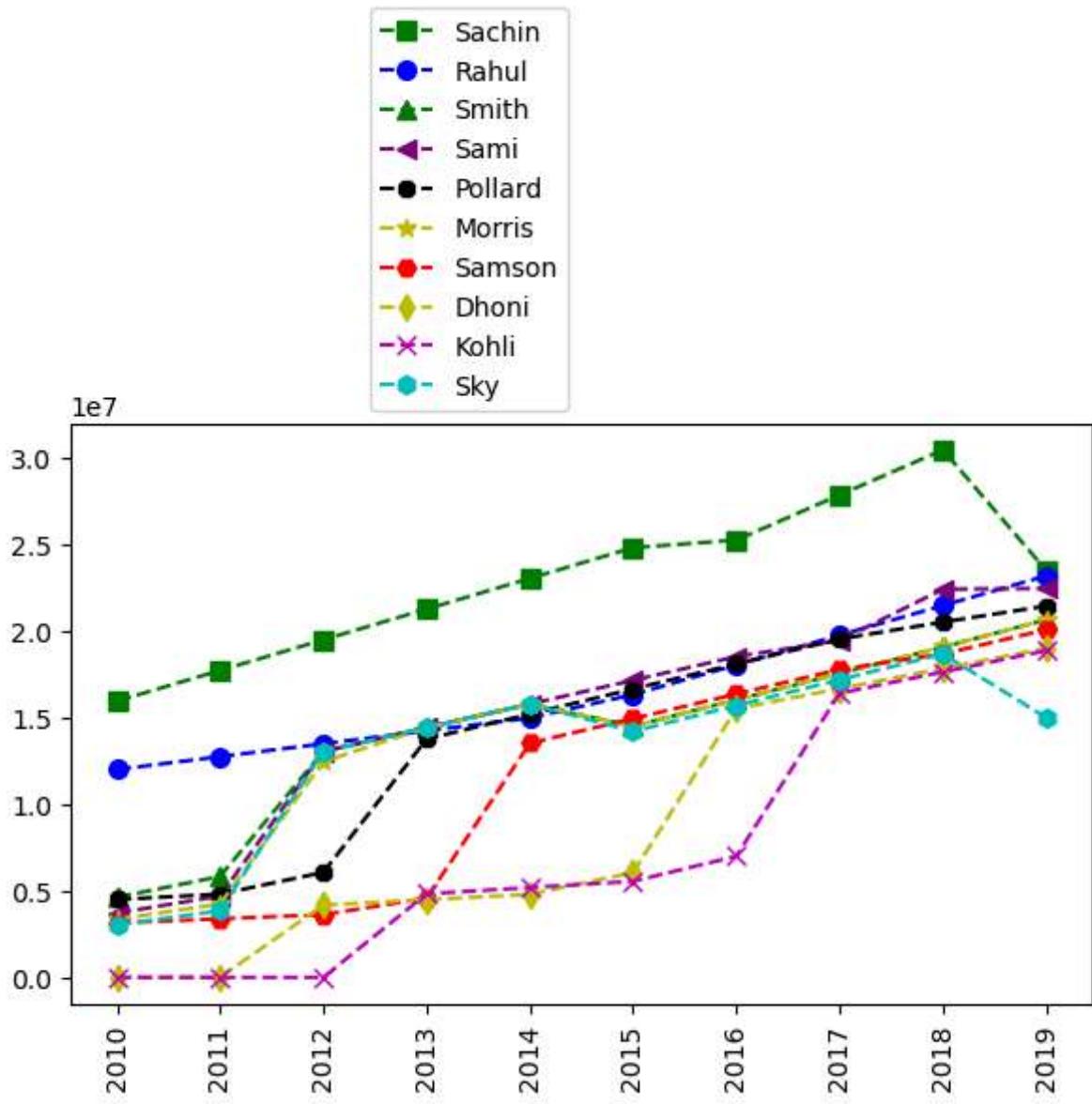


In [101]:

```
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()
```

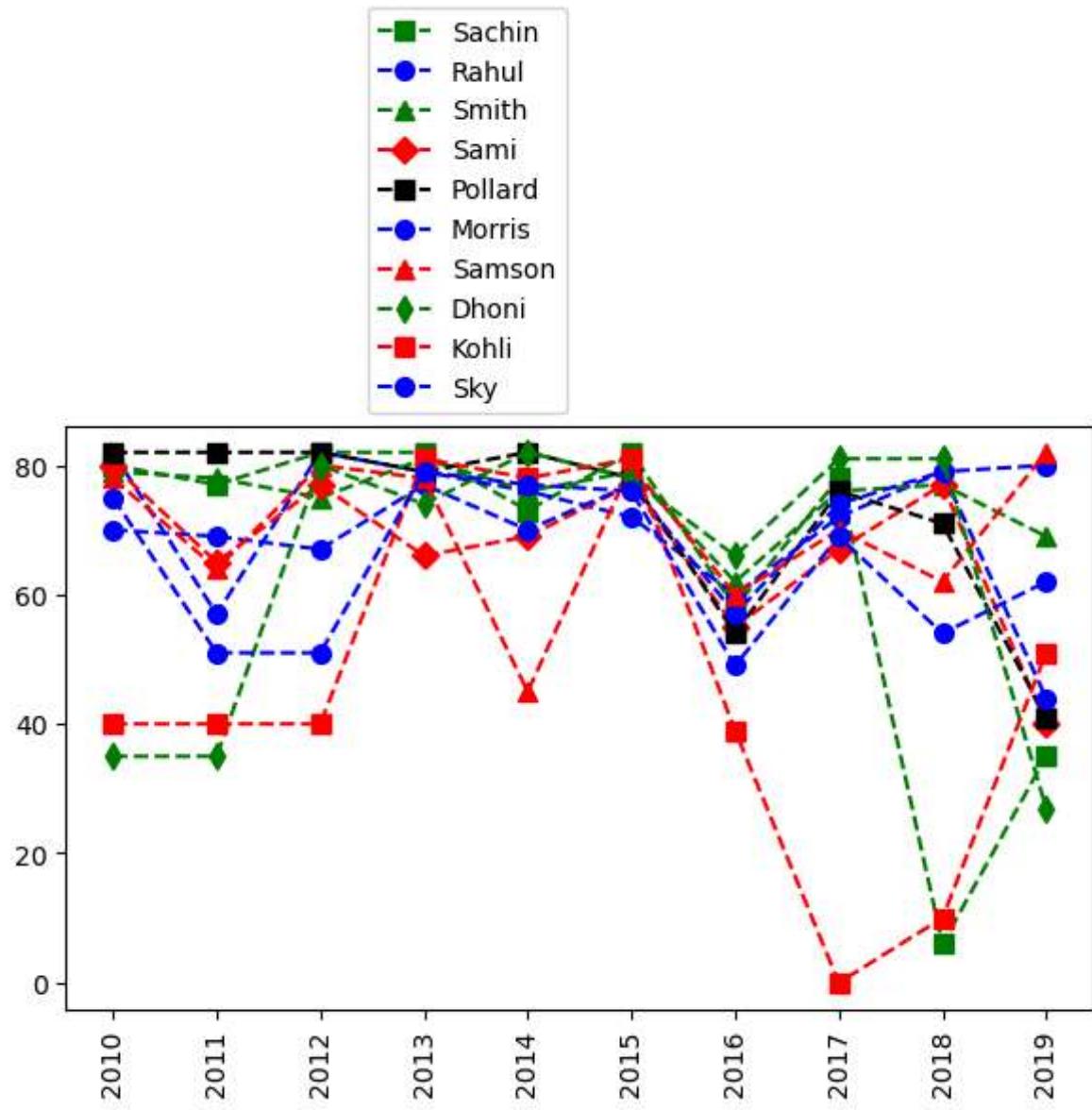


```
In [102]: plt.plot(Salary[0], c='Green', ls = '--', marker = 's', ms = 7, label = Players[0])
plt.plot(Salary[1], c='Blue', ls = '--', marker = 'o', ms = 7, label = Players[1])
plt.plot(Salary[2], c='Green', ls = '--', marker = '^', ms = 7, label = Players[2])
plt.plot(Salary[3], c='Purple', ls = '--', marker = '<', ms = 7, label = Players[3])
plt.plot(Salary[4], c='Black', ls = '--', marker = '8', ms = 7, label = Players[4])
plt.plot(Salary[5], c='y', ls = '--', marker = '*', ms = 7, label = Players[5])
plt.plot(Salary[6], c='Red', ls = '--', marker = 'H', ms = 7, label = Players[6])
plt.plot(Salary[7], c='y', ls = '--', marker = 'd', ms = 7, label = Players[7])
plt.plot(Salary[8], c='m', ls = '--', marker = 'x', ms = 7, label = Players[8])
plt.plot(Salary[9], c='c', ls = '--', marker = 'h', 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()
```



In [103]:

```
# we can visualize the how many games played by a player
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')
plt.show()
```



In [ ]:

In [ ]: