```python
In [1]:    #Import numpy
           import numpy as np
           #Seasons
           Seasons = ["2015","2016","2017","2018","2019","2020","2021","2022","2023","2024"]
           Sdict = {"2015":0,"2016":1,"2017":2,"2018":3,"2019":4,"2020":5,"2021":6,"2022":7,"2

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

           #Salaries
           Sachin_Salary = [15946875,17718750,19490625,21262500,23034375,24806250,25244493,278
           Rahul_Salary = [12000000,12744189,13488377,14232567,14976754,16324500,18038573,1975
           Smith_Salary = [4621800,5828090,13041250,14410581,15779912,14500000,16022500,175450
           Sami_Salary = [3713640,4694041,13041250,14410581,15779912,17149243,18518574,1945000
           Pollard_Salary = [4493160,4806720,6061274,13758000,15202590,16647180,18091770,19536
           Morris_Salary = [3348000,4235220,12455000,14410581,15779912,14500000,16022500,17545
           Samson_Salary = [3144240,3380160,3615960,4574189,13520500,14940153,16359805,1777945
           Dhoni_Salary = [0,0,4171200,4484040,4796880,6053663,15506632,16669630,17832627,1899
           Kohli_Salary = [0,0,0,4822800,5184480,5546160,6993708,16402500,17632688,18862875]
           Sky_Salary = [3031920,3841443,13041250,14410581,15779912,14200000,15691000,17182000
           #Matrix
           Salary = np.array([Sachin_Salary, Rahul_Salary, Smith_Salary, Sami_Salary, Pollard_

           #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

           #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_
```

```python
In [2]:    Salary
```

```
Out[2]:  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 [3]: `Games`

```
Out[3]:  array([[80, 77, 82, 82, 73, 82, 58, 78,  6, 35],
                [82, 57, 82, 79, 76, 72, 60, 72, 79, 80],
                [79, 78, 75, 81, 76, 79, 62, 76, 77, 69],
                [80, 65, 77, 66, 69, 77, 55, 67, 77, 40],
                [82, 82, 82, 79, 82, 78, 54, 76, 71, 41],
                [70, 69, 67, 77, 70, 77, 57, 74, 79, 44],
                [78, 64, 80, 78, 45, 80, 60, 70, 62, 82],
                [35, 35, 80, 74, 82, 78, 66, 81, 81, 27],
                [40, 40, 40, 81, 78, 81, 39,  0, 10, 51],
                [75, 51, 51, 79, 77, 76, 49, 69, 54, 62]])
```

In [4]: `Salary/Games`

```
C:\Users\abhis\AppData\Local\Temp\ipykernel_10380\3709746658.py:1: RuntimeWarning: d
ivide by zero encountered in divide
  Salary/Games
```

```
Out[4]:  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 [5]: `np.round(Salary/Games)`

```
C:\Users\abhis\AppData\Local\Temp\ipykernel_10380\3232172828.py:1: RuntimeWarning: d
ivide by zero encountered in divide
  np.round(Salary/Games)
```

```
Out[5]: 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 [6]: `np.round(Salary/Games)`

```
C:\Users\abhis\AppData\Local\Temp\ipykernel_10380\3232172828.py:1: RuntimeWarning: d
ivide by zero encountered in divide
  np.round(Salary/Games)
```

```
Out[6]: 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 [7]: `Games[5]`

Out[7]: `array([70, 69, 67, 77, 70, 77, 57, 74, 79, 44])`

In [8]: `Pdict`

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

```
In [9]:  Sdict
```

```
Out[9]:  {'2015': 0,
          '2016': 1,
          '2017': 2,
          '2018': 3,
          '2019': 4,
          '2020': 5,
          '2021': 6,
          '2022': 7,
          '2023': 8,
          '2024': 9}
```
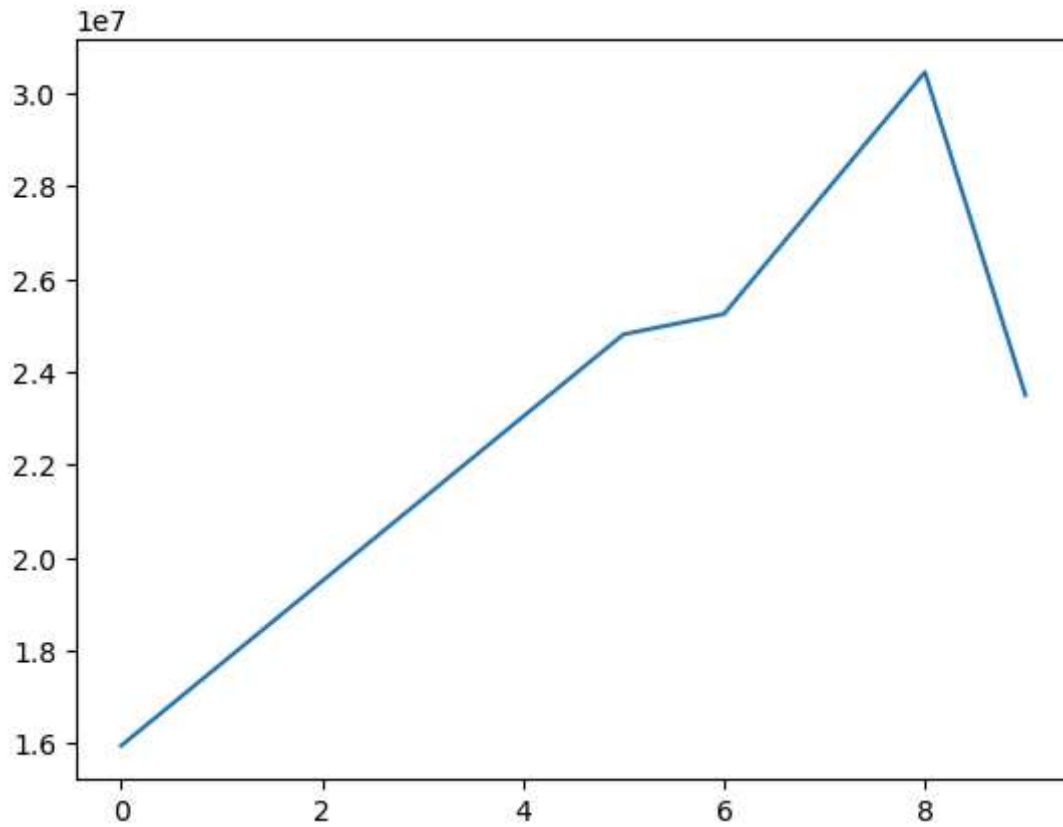
```
In [10]:  Salary[0]
```

```
Out[10]:  array([15946875, 17718750, 19490625, 21262500, 23034375, 24806250,
                 25244493, 27849149, 30453805, 23500000])
```

```python
In [12]:  import warnings # use for data visuzlition
          warnings.filterwarnings('ignore')
```

```python
In [14]:  import matplotlib.pyplot as plt
```

```python
In [15]:  plt.plot(Salary[0])
```

```
Out[15]:  [<matplotlib.lines.Line2D at 0x1825c4a5450>]
```

```
In [16]:  plt.plot(Salary[0],c='red')
```
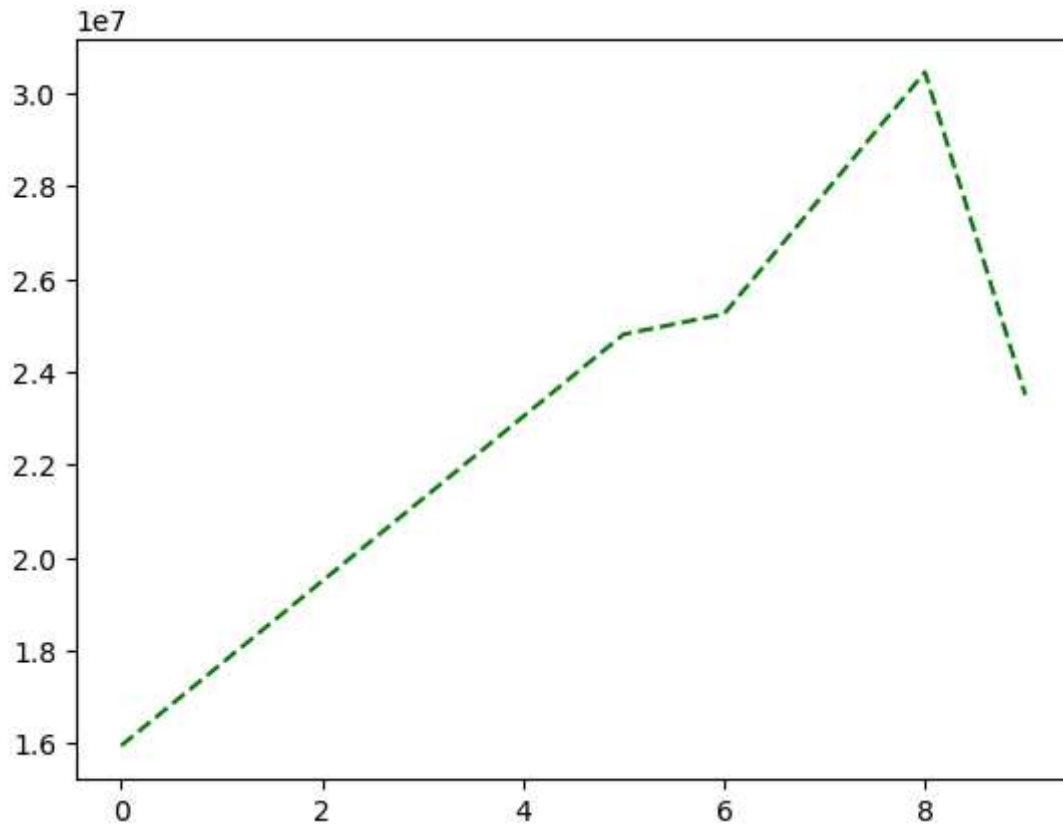
Out[16]: [<matplotlib.lines.Line2D at 0x1825c5cdbd0>]
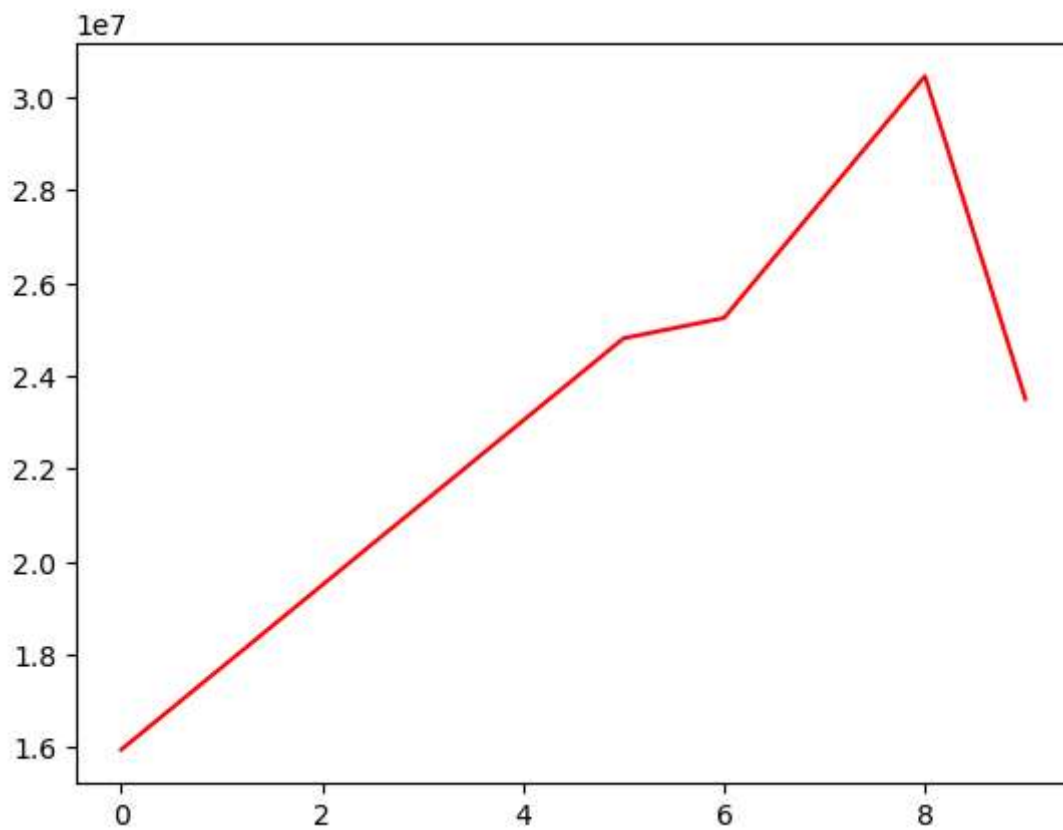
In [17]:
```python
plt.plot(Salary[0],c='green')
```

Out[17]: [<matplotlib.lines.Line2D at 0x1825c64cb90>]
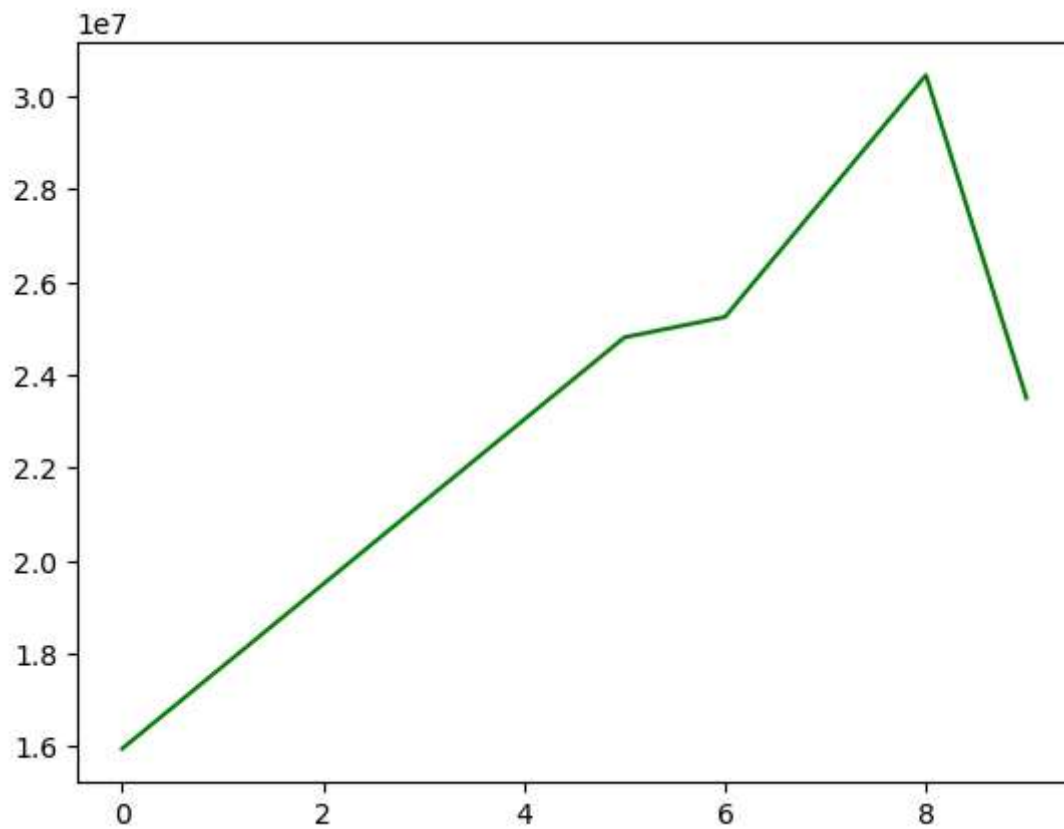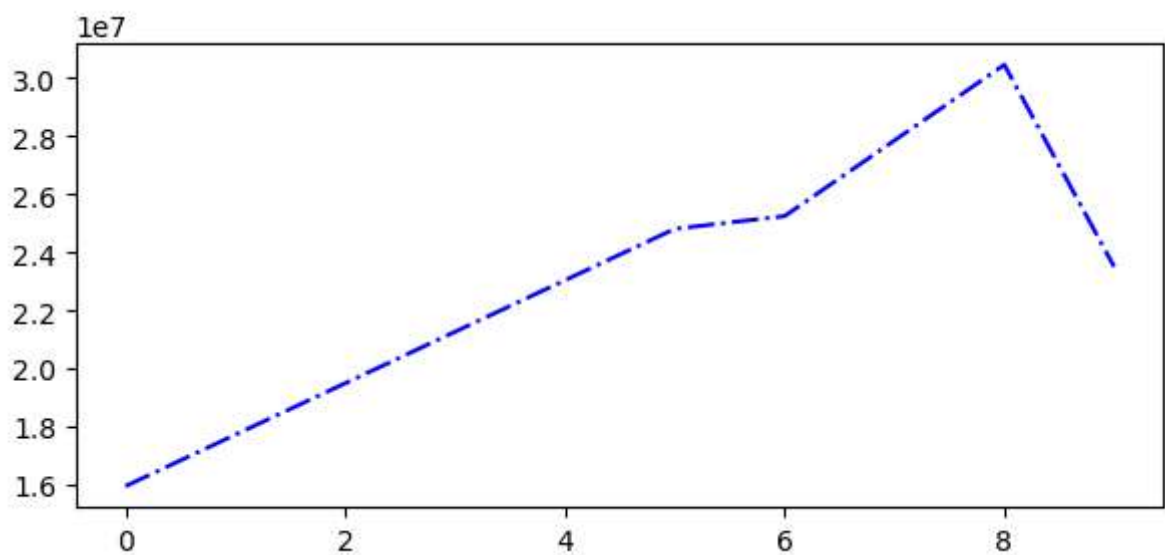

In [21]:
```python
plt.plot(Salary[0],c='green',ls='--')
```
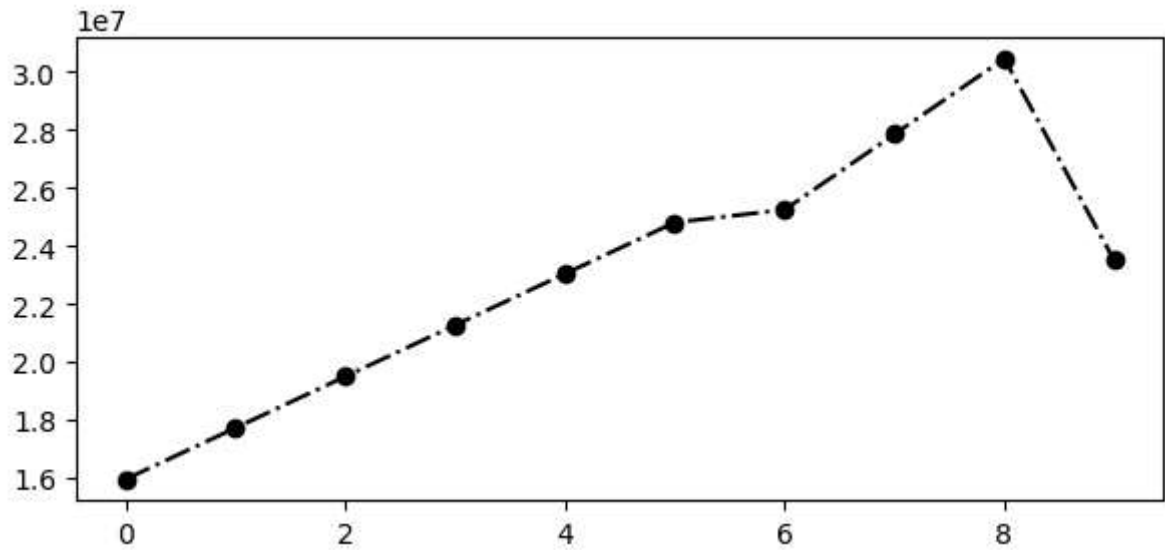
Out[21]: [<matplotlib.lines.Line2D at 0x1825fca2ad0>]

```
In [27]: %matplotlib inline
         plt.rcParams['figure.figsize']=7,3
```
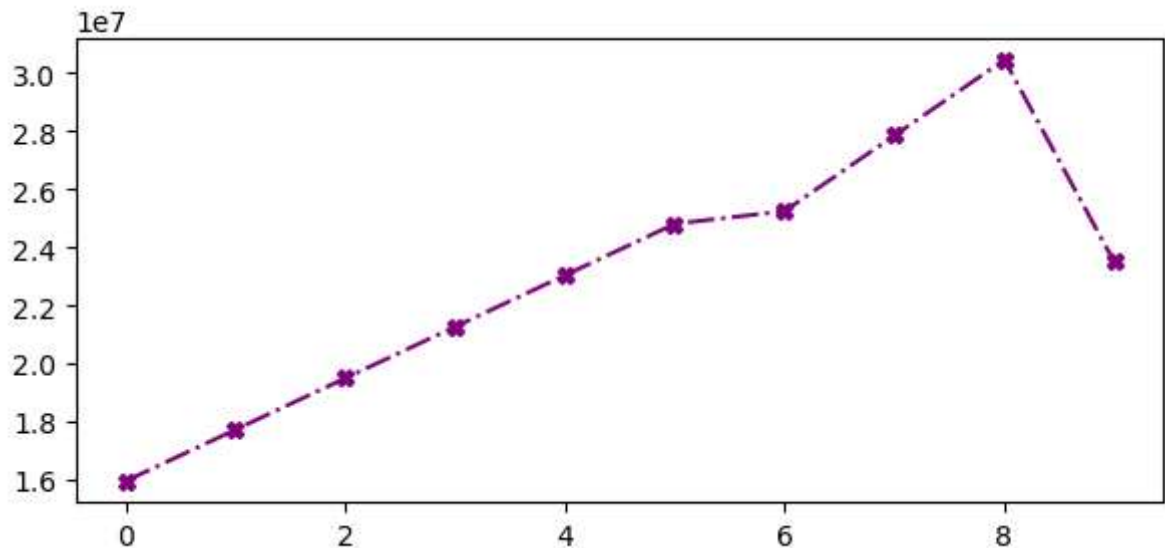
```
In [28]: plt.plot(Salary[0],c='b',ls='-.')
         plt.show()
```



```
In [30]: plt.plot(Salary[0],c='black',ls='-.',marker='o')
         plt.show()
```

```
In [32]: plt.plot(Salary[0],c='purple',ls='-.',marker='X')
         plt.show()
```
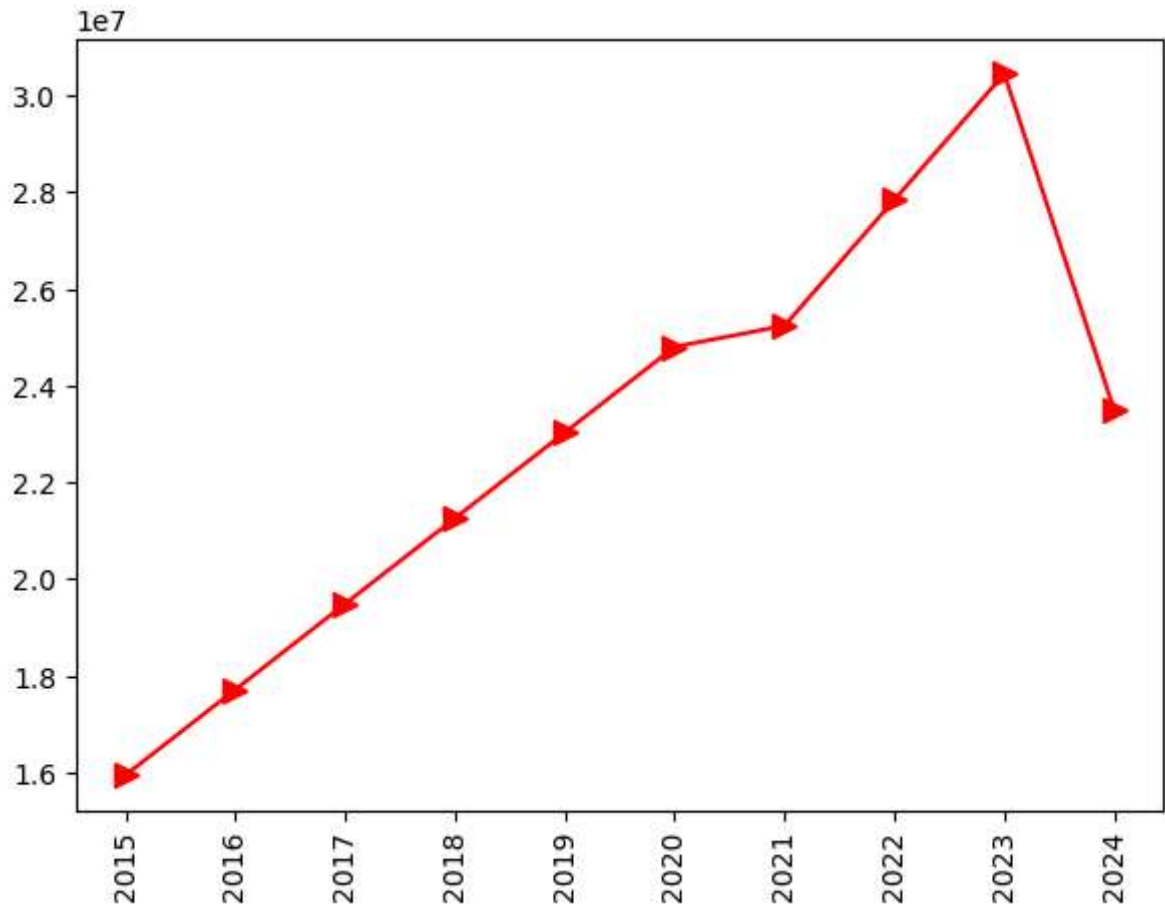


```
In [33]: Sdict
```

```
Out[33]: {'2015': 0,
          '2016': 1,
          '2017': 2,
          '2018': 3,
          '2019': 4,
          '2020': 5,
          '2021': 6,
          '2022': 7,
          '2023': 8,
          '2024': 9}
```

```
In [40]: %matplotlib inline
         plt.rcParams['figure.figsize']=7,5
```
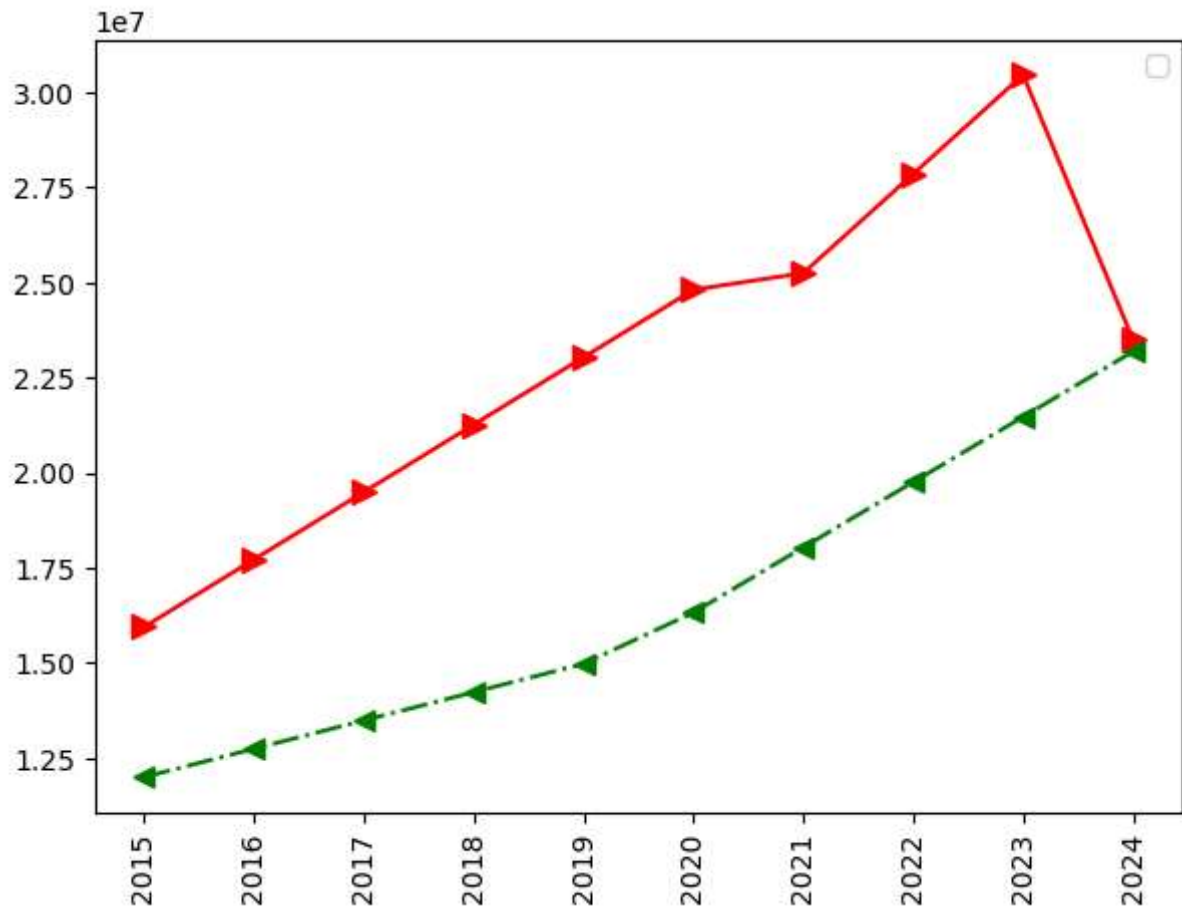
In [49]:
```python
plt.plot(Salary[0],c='red',ls='-',marker='>',ms=8)
plt.xticks(list(range(0,10)),Seasons,rotation='vertical')
plt.show()
```


In [52]:
```python
plt.plot(Salary[0],c='red',ls='-',marker='>',ms=8)
plt.plot(Salary[1],c='green',ls='-.',marker='<',ms=7)

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

plt.show()
```
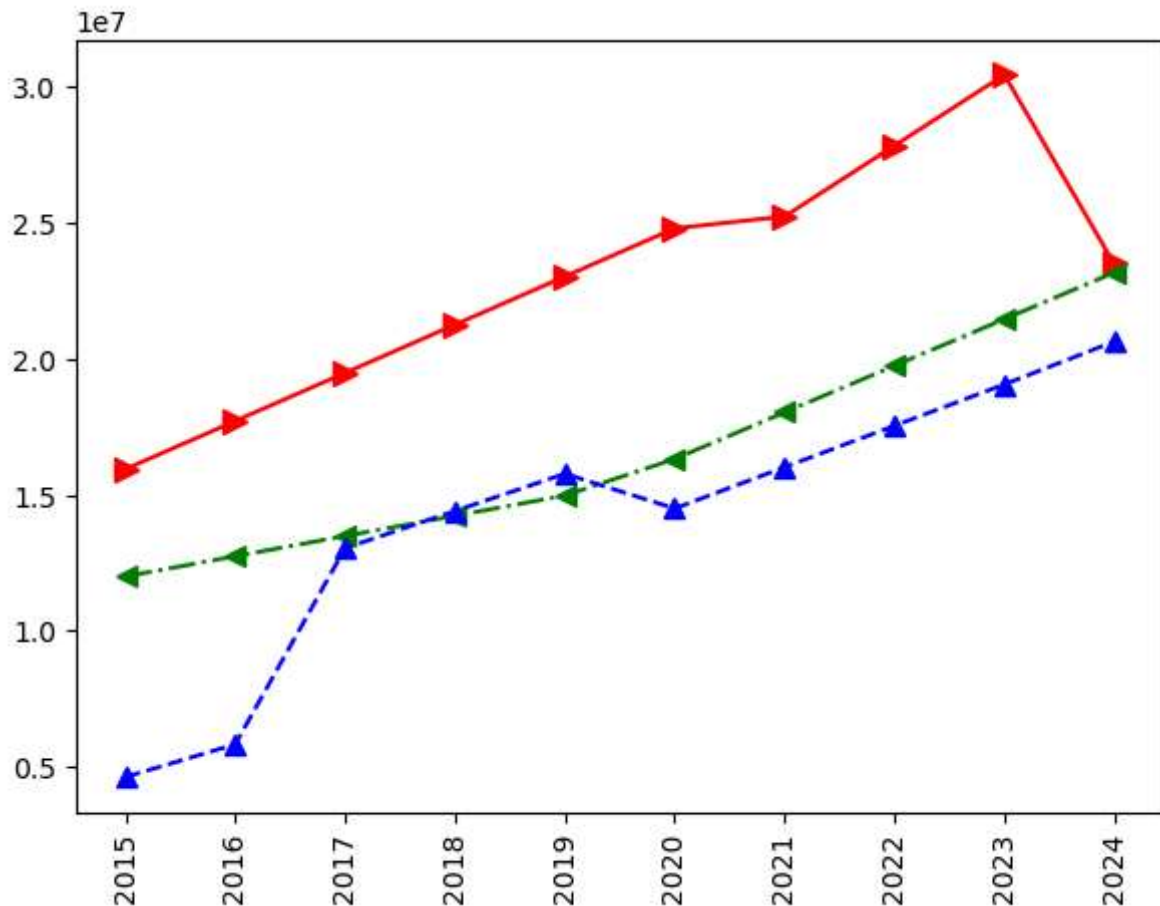
```
In [53]:  plt.plot(Salary[0],c='red',ls='-',marker='>',ms=8)
          plt.plot(Salary[1],c='green',ls='-.',marker='<',ms=7)
          plt.plot(Salary[2],c='blue',ls='--',marker='^',ms=7)

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

          plt.show()
```
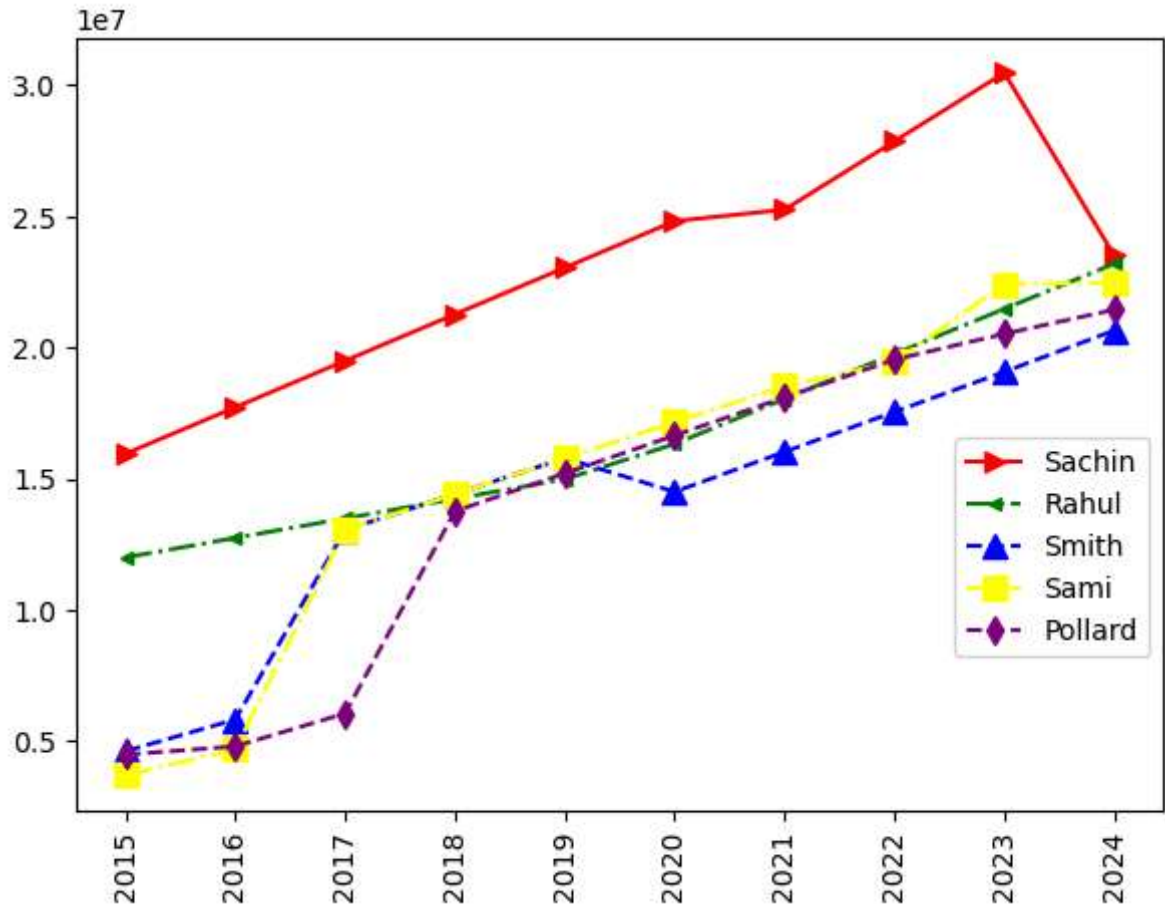
```
In [58]:   plt.plot(Salary[0],c='red',ls='-',marker='>',ms=7,label=Players[0])
           plt.plot(Salary[1],c='green',ls='-.',marker='<',ms=5,label=Players[1])
           plt.plot(Salary[2],c='blue',ls='--',marker='^',ms=8,label=Players[2])
           plt.plot(Salary[3],c='yellow',ls='-.',marker='s',ms=8,label=Players[3])
           plt.plot(Salary[4],c='purple',ls='--',marker='d',ms=7,label=Players[4])
           plt.plot(Salary[3],c='yellow',ls='-.',marker='s',ms=8,label=Players[3])
           plt.plot(Salary[4],c='purple',ls='--',marker='d',ms=7,label=Players[4])


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

In [ ]: