Project 2_IPL Data Analysis using NumPy & Matplotlib

```
In [1]: import numpy as np
In [4]: #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
        #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 PT
In [5]:
        Salary # matrix format
Out[5]: 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, 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 [6]: Games
```

```
Out[6]: 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 [7]:
        Points
Out[7]: 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 [8]: Games
Out[8]: 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 [9]: | Games[5]
Out[9]: array([70, 69, 67, 77, 70, 77, 57, 74, 79, 44])
```

```
In [10]: Games[0,5]
Out[10]: 82
         Games[1:2]
In [11]:
Out[11]: array([[82, 57, 82, 79, 76, 72, 60, 72, 79, 80]])
In [12]: Points
Out[12]: array([[2832, 2430, 2323, 2201, 1970, 2078, 1616, 2133, 83, 782],
                [1653, 1426, 1779, 1688, 1619, 1312, 1129, 1170, 1245, 1154],
                [2478, 2132, 2250, 2304, 2258, 2111, 1683, 2036, 2089, 1743],
                [2122, 1881, 1978, 1504, 1943, 1970, 1245, 1920, 2112, 966],
                [1292, 1443, 1695, 1624, 1503, 1784, 1113, 1296, 1297, 646],
                [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 [13]: Points[0]
Out[13]: array([2832, 2430, 2323, 2201, 1970, 2078, 1616, 2133, 83, 782])
In [14]:
         Points[1:4]
Out[14]: array([[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]])
In [15]: | Points[:]
```

```
Out[15]: 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 [16]:
         Points[-6, -1]
Out[16]: 646
In [17]: | Games
Out[17]: 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 [18]:
         Pdict
Out[18]: {'Sachin': 0,
           'Rahul': 1,
           'Smith': 2,
           'Sami': 3,
           'Pollard': 4,
           'Morris': 5,
           'Samson': 6,
           'Dhoni': 7,
           'Kohli': 8,
           'Sky': 9}
```

```
In [19]: Pdict['Rahul']
Out[19]: 1
         Games[1]
In [20]:
Out[20]: array([82, 57, 82, 79, 76, 72, 60, 72, 79, 80])
In [21]: Games[Pdict['Rahul']]
Out[21]: array([82, 57, 82, 79, 76, 72, 60, 72, 79, 80])
In [22]:
         Games
Out[22]: 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 [23]: Pdict['Rahul']
Out[23]: 1
In [24]: Points
```

```
Out[24]: 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 [25]:
         Salary
Out[25]: 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, 4822800, 5184480, 5546160,
                  6993708, 16402500, 17632688, 18862875],
                 [ 3031920, 3841443, 13041250, 14410581, 15779912, 14200000,
                 15691000, 17182000, 18673000, 15000000]])
In [26]: Games
```

In [27]: Salary/Games

C:\Users\91911\AppData\Local\Temp\ipykernel_11880\3709746658.py:1: RuntimeWarning: divide by zero encountered in divide Salary/Games

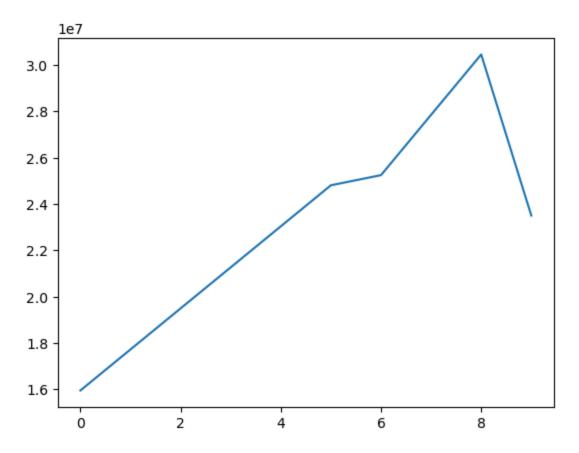
```
Out[27]: array([[ 199335.9375
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                                    315539.38356164, 302515.24390244,
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                  435249.87931034, 357040.37179487, 5075634.16666667,
                  671428.57142857],
                [ 146341.46341463, 223582.26315789, 164492.40243902,
                  180159.07594937, 197062.55263158, 226729.16666667,
                  300642.88333333, 274342.29166667, 271730.60759494,
                  289759.875
                [ 58503.79746835,
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                  177908.40740741, 207630.42105263, 183544.30379747,
                  258427.41935484,
                                    230855.26315789, 247629.87012987,
                  299194.20289855],
                46420.5
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                  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,
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                                                   , 185895.52238806,
                  187150.4025974 , 225427.31428571, 188311.68831169,
                  281096.49122807, 237094.59459459, 241360.75949367,
                  469190.90909091],
                [ 40310.76923077,
                                     52815.
                                                       45199.5
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                  272663.41666667, 253992.25714286,
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                  244738.57317073],
                       0.
                                         0.
                                                       52140.
                                                       77611.06410256,
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                                         0.
                                                          0.
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                                                       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]])
```

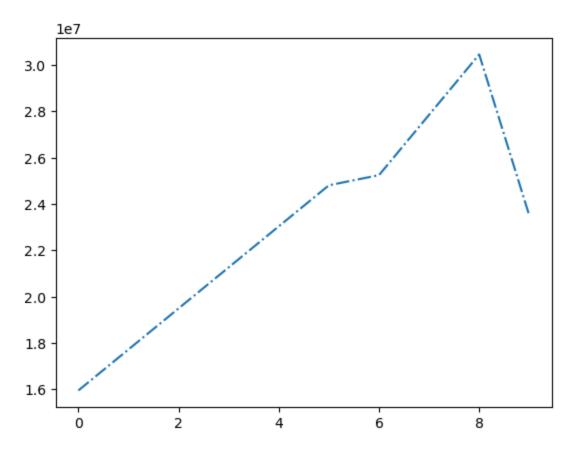
```
In [28]: np.round(Salary/Games)
       C:\Users\91911\AppData\Local\Temp\ipykernel 11880\3232172828.py:1: RuntimeWarning: divide by zero encountered in divide
         np.round(Salary/Games)
                          230114., 237691., 259299., 315539., 302515.,
Out[28]: array([[ 199336.,
                 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.],
                          58619., 73918., 174152., 185397., 213425.,
                [ 54795.,
                 335033., 257057., 288918., 522836.],
                           61380., 185896., 187150., 225427., 188312.,
                [ 47829.,
                 281096., 237095., 241361., 469191.],
                [ 40311.,
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                                                       300456., 186752.,
                 272663., 253992., 301104., 244739.],
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                               0.,
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                                              60595.,
                                                        58499.,
                                                                 77611.,
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                                    220156., 703542.],
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                      0.,
                               0.,
                                         0.,
                                                        66468.,
                                                                 68471.,
                              inf, 1763269., 369860.],
                 179326.,
                [ 40426.,
                          75322., 255711., 182412., 204934., 186842.,
                 320224., 249014., 345796., 241935.]])
In [29]: np.round(Salary/Games)
```

C:\Users\91911\AppData\Local\Temp\ipykernel_11880\3232172828.py:1: RuntimeWarning: divide by zero encountered in divide np.round(Salary/Games)

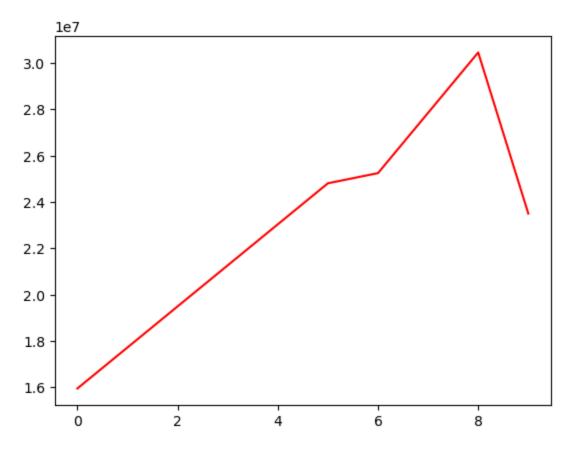
```
Out[29]: array([[ 199336., 230114., 237691., 259299., 315539., 302515.,
                 435250., 357040., 5075634., 671429.],
               [ 146341., 223582., 164492., 180159., 197063., 226729.,
                 300643., 274342., 271731., 289760.],
                          74719., 173883., 177908., 207630., 183544.,
                Γ 58504..
                 258427., 230855., 247630., 299194.],
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                 336701., 290299., 291006., 561450.],
               54795.,
                           58619., 73918., 174152., 185397., 213425.,
                 335033., 257057., 288918., 522836.],
               [ 47829., 61380., 185896., 187150., 225427., 188312.,
                 281096., 237095., 241361., 469191.],
                          52815., 45200., 58643., 300456., 186752.,
               [ 40311.,
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                               0.,
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                                                       58499.,
                                                                 77611.,
                 234949., 205798., 220156., 703542.],
                      0.,
                               0.,
                                        0., 59541.,
                                                       66468.,
                                                                 68471.,
                              inf, 1763269., 369860.],
                 179326.,
               [ 40426.,
                          75322., 255711., 182412., 204934., 186842.,
                 320224., 249014., 345796., 241935.]])
In [30]: import warnings
In [31]: warnings.filterwarnings('ignore')
        import matplotlib.pyplot as plt
In [33]:
        %matplotlib inline
In [34]:
        Salary
In [35]:
```

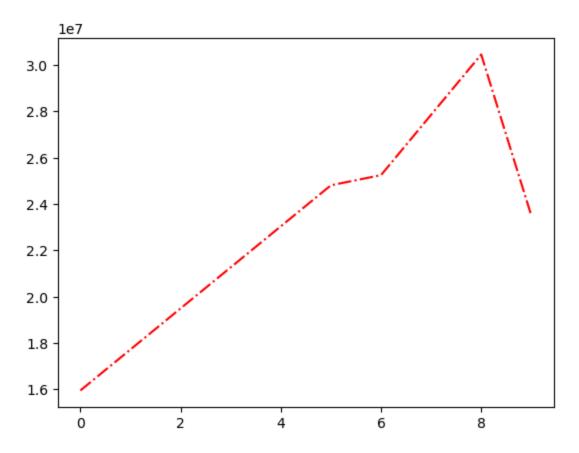
```
Out[35]: array([[15946875, 17718750, 19490625, 21262500, 23034375, 24806250,
                 25244493, 27849149, 30453805, 23500000],
                 [12000000, 12744189, 13488377, 14232567, 14976754, 16324500,
                 18038573, 19752645, 21466718, 23180790],
                [ 4621800, 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, 4171200, 4484040, 4796880, 6053663,
                 15506632, 16669630, 17832627, 18995624],
                                            0, 4822800, 5184480, 5546160,
                        0,
                                  0,
                  6993708, 16402500, 17632688, 18862875],
                [ 3031920, 3841443, 13041250, 14410581, 15779912, 14200000,
                 15691000, 17182000, 18673000, 15000000]])
In [36]: | Salary[0]
Out[36]: array([15946875, 17718750, 19490625, 21262500, 23034375, 24806250,
                25244493, 27849149, 30453805, 23500000])
In [37]: plt.plot(Salary[0])
         plt.show()
```



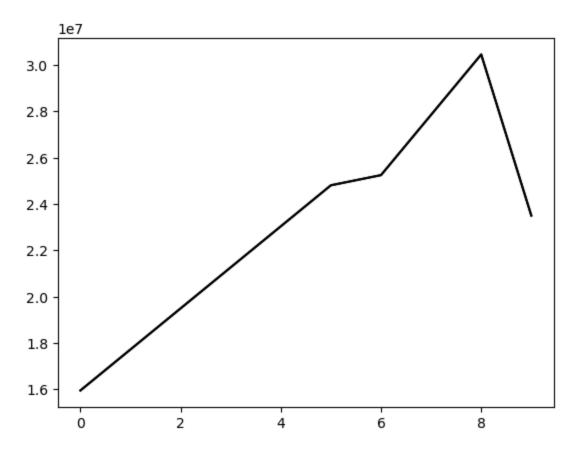


```
In [39]: plt.plot(Salary[0],ls='-',color = 'red')
plt.show()
```

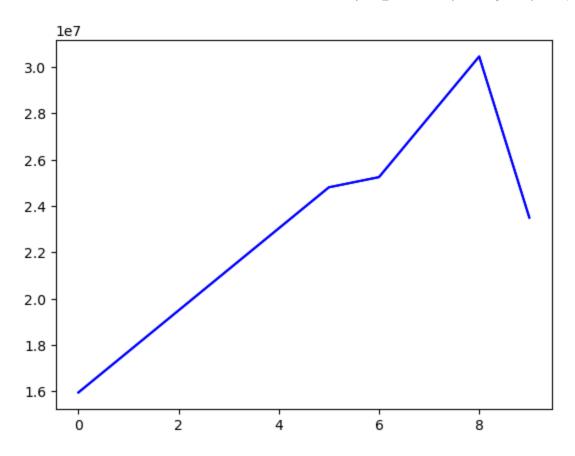




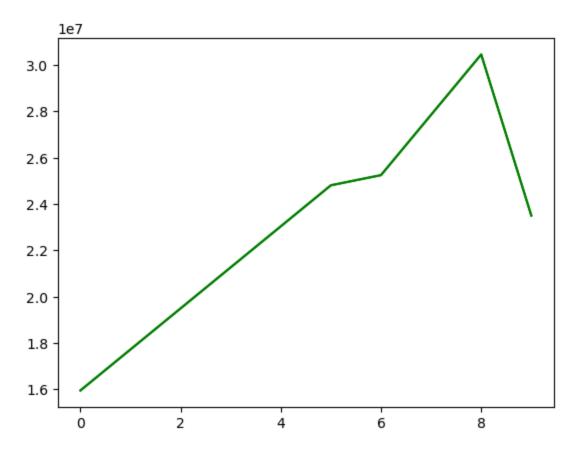
In [42]: plt.plot(Salary[0],color="k")
 plt.show()

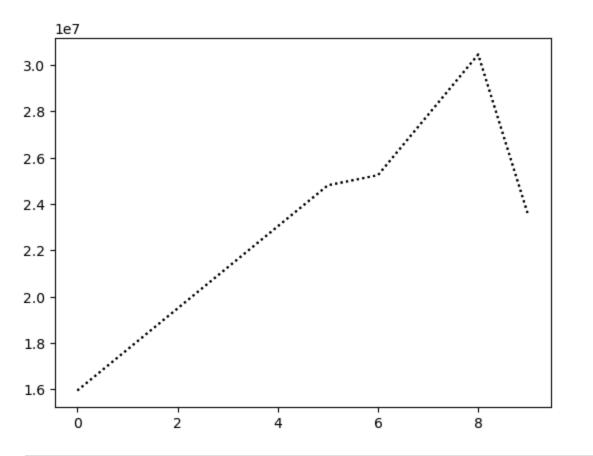


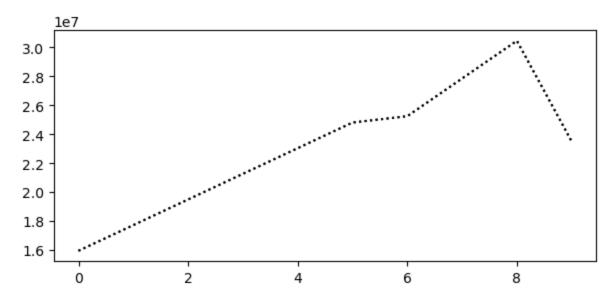
```
In [44]: plt.plot(Salary[0],c="b")
plt.show()
```

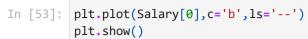


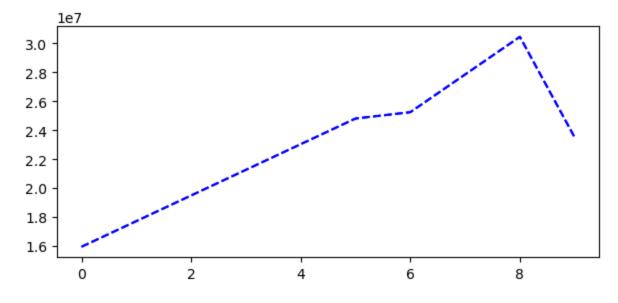
In [46]: plt.plot(Salary[0],c="g")
 plt.show()











In []: