

IPL Data Analysis using NumPy

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

#Salaries
Sachin_Salary = [15946875, 17718750, 19490625, 21262500, 23034375, 24806250, 25244493, 278100000, 29641875, 31488377, 33232567, 34976754, 36324500, 38038573, 3975]
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_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_
```

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,         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 [7]: Games

```
Out[7]: 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]: Points

```
Out[9]: 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 [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 [15]: Games[5] #5th player games
```

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

```
In [19]: Games[0:5]
```

```
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]])
```

```
In [21]: Games[0,5]
```

```
Out[21]: 82
```

```
In [23]: Games
```

```
Out[23]: 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 [25]: Games[1:2]
```

```
Out[25]: array([[82, 57, 82, 79, 76, 72, 60, 72, 79, 80]])
```

```
In [27]: Games[-3:-1]
```

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

```
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 [31]: Points[0]
```

```
Out[31]: array([2832, 2430, 2323, 2201, 1970, 2078, 1616, 2133, 83, 782])
```

```
In [33]: Points[:]
```

```
Out[33]: 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 [35]: Points[-6,-1]
```

```
Out[35]: 646
```

```
In [37]: Games
```

```
Out[37]: 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 [39]: Pdict
```

```
Out[39]: {'Sachin': 0,  
          'Rahul': 1,  
          'Smith': 2,  
          'Sami': 3,  
          'Pollard': 4,  
          'Morris': 5,  
          'Samson': 6,  
          'Dhoni': 7,  
          'Kohli': 8,  
          'Sky': 9}
```

```
In [41]: Pdict['Rahul']
```

```
Out[41]: 1
```

```
In [43]: Pdict['Sachin']
```

```
Out[43]: 0
```

```
In [47]: Games[1] #Games of rahul
```

```
Out[47]: array([82, 57, 82, 79, 76, 72, 60, 72, 79, 80])
```

```
In [53]: Games[Pdict['Rahul']]
```

```
Out[53]: array([82, 57, 82, 79, 76, 72, 60, 72, 79, 80])
```

```
In [55]: Points
```

```
Out[55]: 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 [57]: Salary
```

```
Out[57]: 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 [59]: Games

```
Out[59]: 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 [65]: Salary//Games

```
C:\Users\HP\AppData\Local\Temp\ipykernel_8528\1634212085.py:1: RuntimeWarning: divide by zero encountered in floor_divide
Salary//Games
```

```
Out[65]: array([[ 199335,  230113,  237690,  259298,  315539,  302515,  435249,
   357040,  5075634,  671428],
 [ 146341,  223582,  164492,  180159,  197062,  226729,  300642,
  274342,  271730,  289759],
 [ 58503,   74719,  173883,  177908,  207630,  183544,  258427,
 230855,  247629,  299194],
 [ 46420,   72216,  169366,  218342,  228694,  222717,  336701,
 290298,  291006,  561450],
 [ 54794,   58618,  73917,  174151,  185397,  213425,  335032,
 257057,  288918,  522835],
 [ 47828,   61380,  185895,  187150,  225427,  188311,  281096,
 237094,  241360,  469190],
 [ 40310,   52815,  45199,  58643,  300455,  186751,  272663,
 253992,  301103,  244738],
 [ 0,       0,      52140,  60595,  58498,  77611,  234948,
 205797,  220155,  703541],
 [ 0,       0,      0,      59540,  66467,  68471,  179325,
 0,      1763268,  369860],
 [ 40425,   75322,  255710,  182412,  204933,  186842,  320224,
 249014,  345796,  241935]])
```

In [67]: `np.round(Salary//Games)`

```
C:\Users\HP\AppData\Local\Temp\ipykernel_8528\3663165759.py:1: RuntimeWarning: divide by zero encountered in floor_divide
np.round(Salary//Games)
```

```
Out[67]: array([[ 199335,  230113,  237690,  259298,  315539,  302515,  435249,
   357040,  5075634,  671428],
 [ 146341,  223582,  164492,  180159,  197062,  226729,  300642,
  274342,  271730,  289759],
 [ 58503,   74719,  173883,  177908,  207630,  183544,  258427,
 230855,  247629,  299194],
 [ 46420,   72216,  169366,  218342,  228694,  222717,  336701,
 290298,  291006,  561450],
 [ 54794,   58618,  73917,  174151,  185397,  213425,  335032,
 257057,  288918,  522835],
 [ 47828,   61380,  185895,  187150,  225427,  188311,  281096,
 237094,  241360,  469190],
 [ 40310,   52815,  45199,  58643,  300455,  186751,  272663,
 253992,  301103,  244738],
 [ 0,       0,      52140,  60595,  58498,  77611,  234948,
 205797,  220155,  703541],
 [ 0,       0,      0,      59540,  66467,  68471,  179325,
 0,      1763268,  369860],
 [ 40425,   75322,  255710,  182412,  204933,  186842,  320224,
 249014,  345796,  241935]])
```

In [73]: `import warnings
warnings.filterwarnings('ignore')
#warnings will be ignored`

In [75]: `import matplotlib.pyplot as plt`

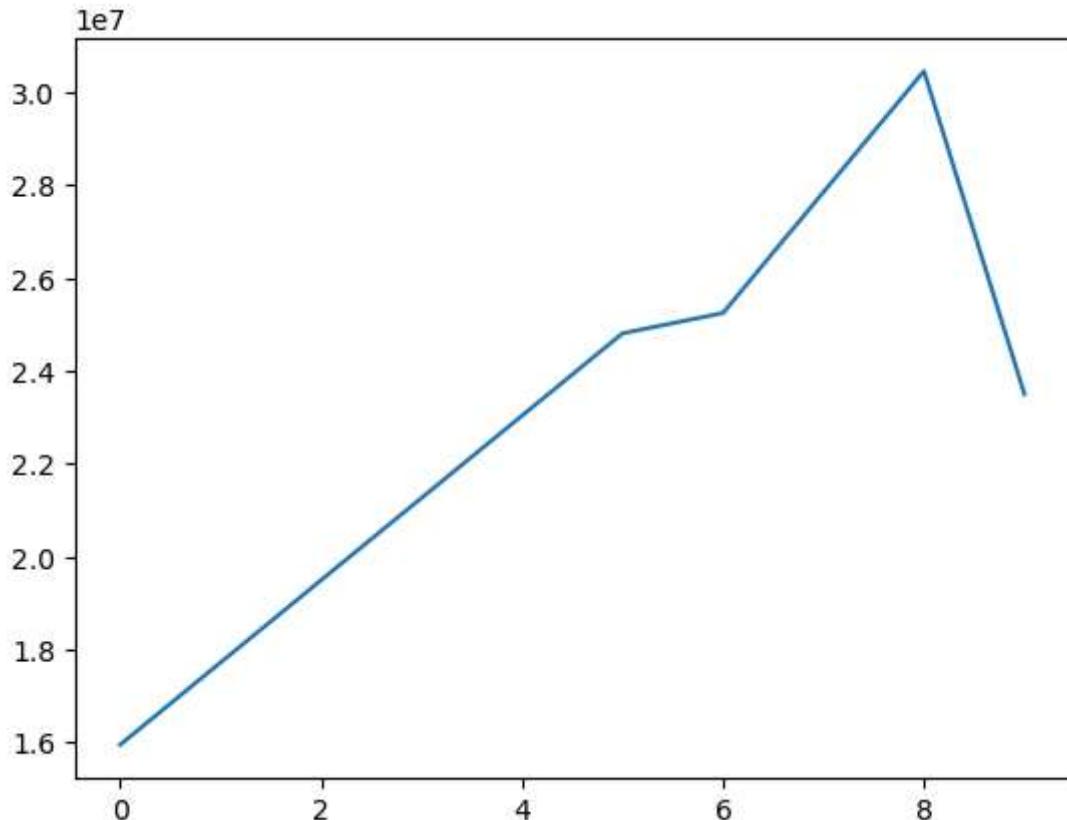
In [77]: `Salary`

```
Out[77]: 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]])
```

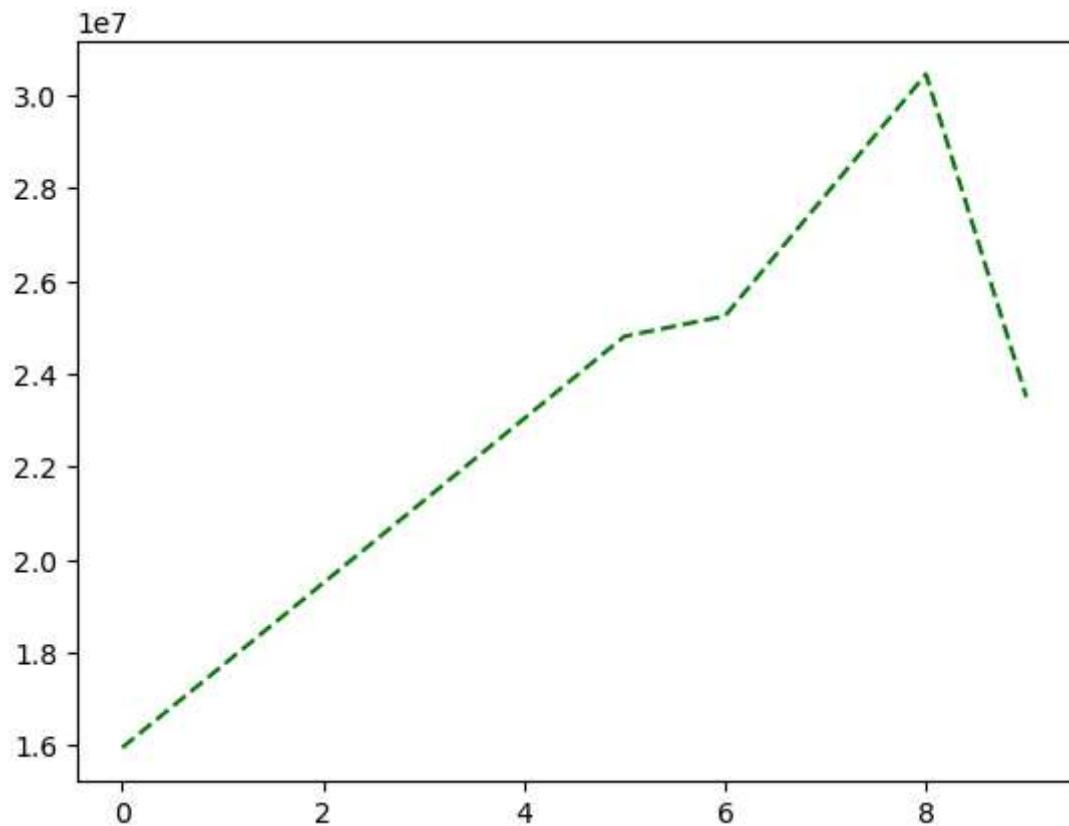
```
In [79]: Salary[0]
```

```
Out[79]: array([15946875, 17718750, 19490625, 21262500, 23034375, 24806250,
   25244493, 27849149, 30453805, 23500000])
```

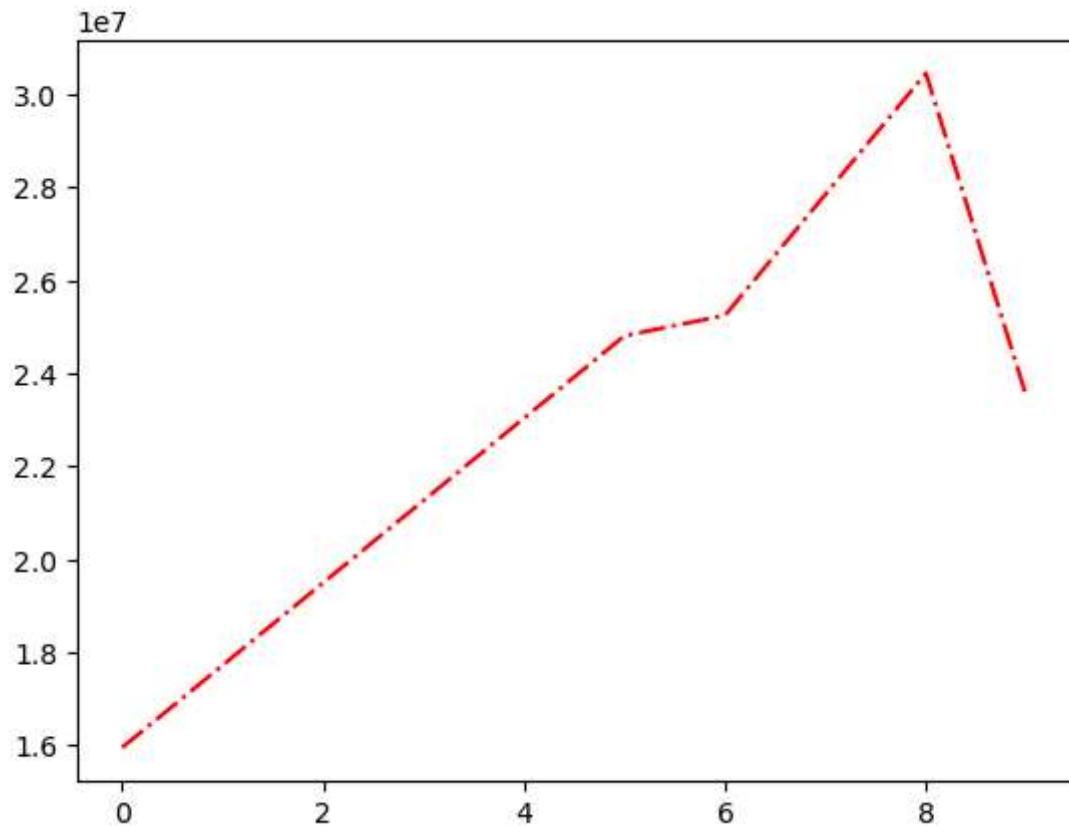
```
In [85]: plt.plot(Salary[0])
plt.show()
```



```
In [102... plt.plot(Salary[0],ls='--',color='green')  
plt.show()
```

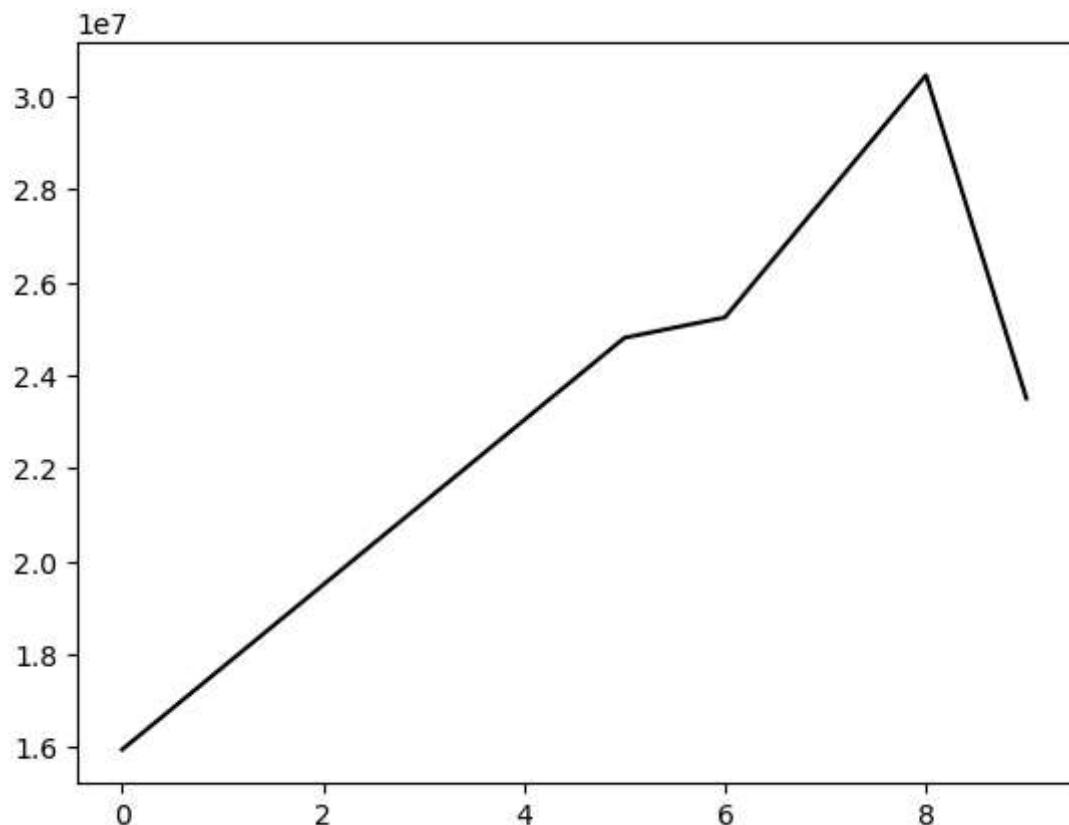


```
In [104... plt.plot(Salary[0],ls='-.',color='red')  
plt.show()
```



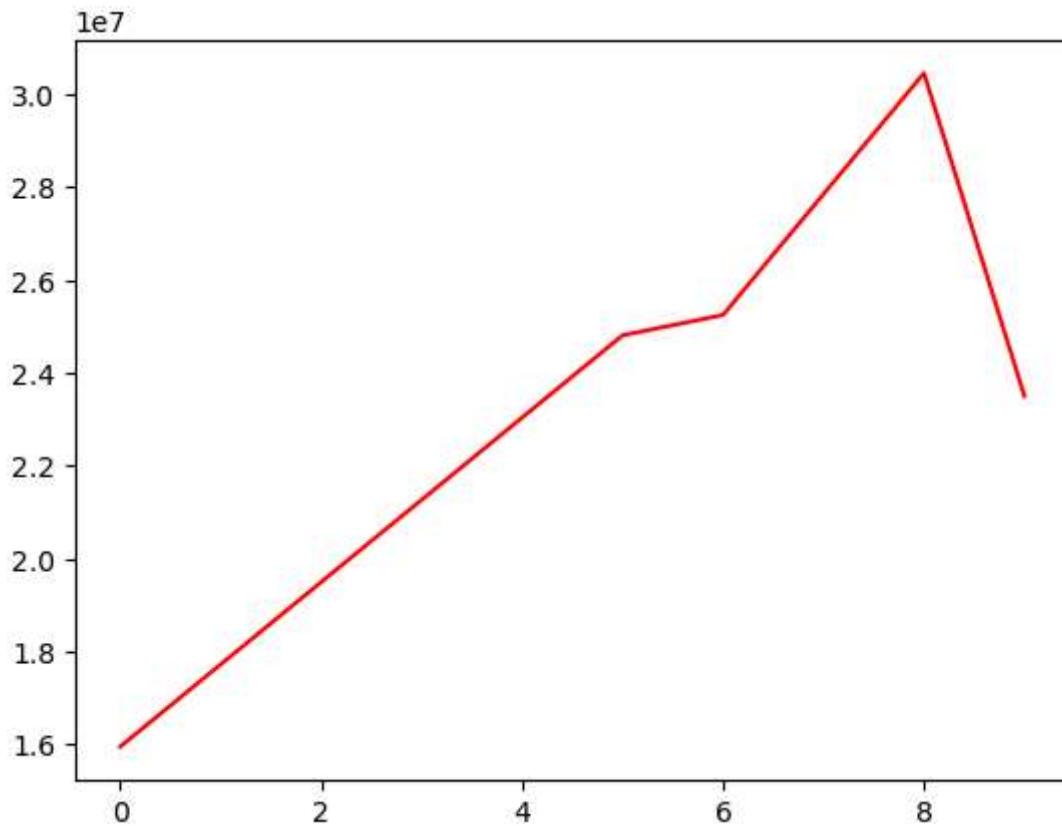
```
In [107]: plt.plot(Salary[0], color='black')
```

```
Out[107]: <matplotlib.lines.Line2D at 0x20a3bb71d30>
```



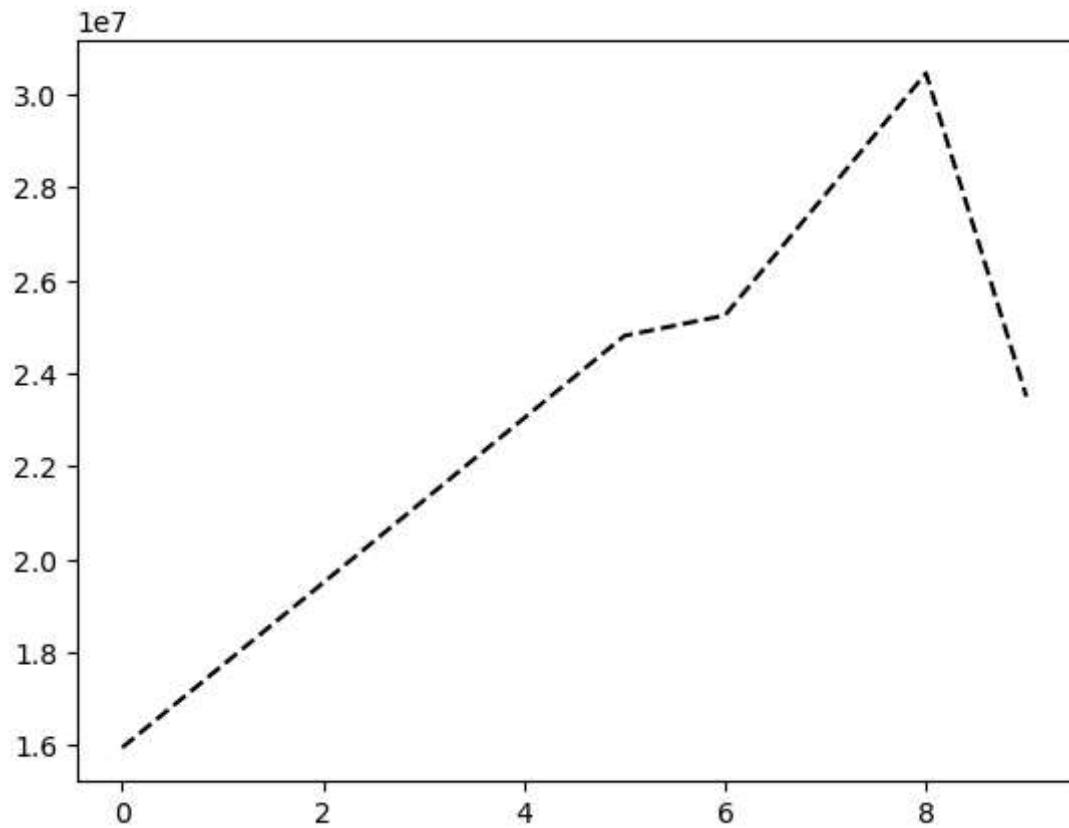
```
In [115... plt.plot(Salary[0],c='r') #Instead of color write c and for black k,r red,shift+ta
```

```
Out[115... [<matplotlib.lines.Line2D at 0x20a3d7186e0>]
```



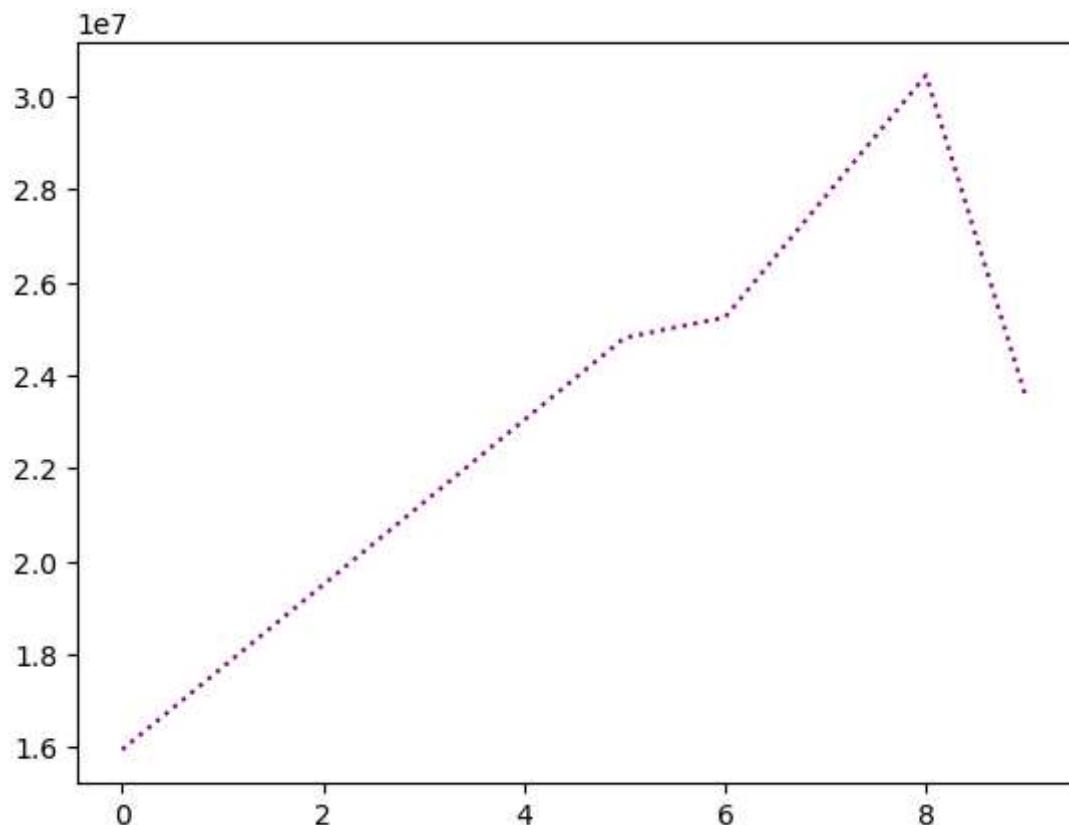
```
In [119... plt.plot(Salary[0],color='k',ls='--')
```

```
Out[119... [<matplotlib.lines.Line2D at 0x20a3c5b0500>]
```



```
In [121]: plt.plot(Salary[0], c='purple', ls='dotted')
```

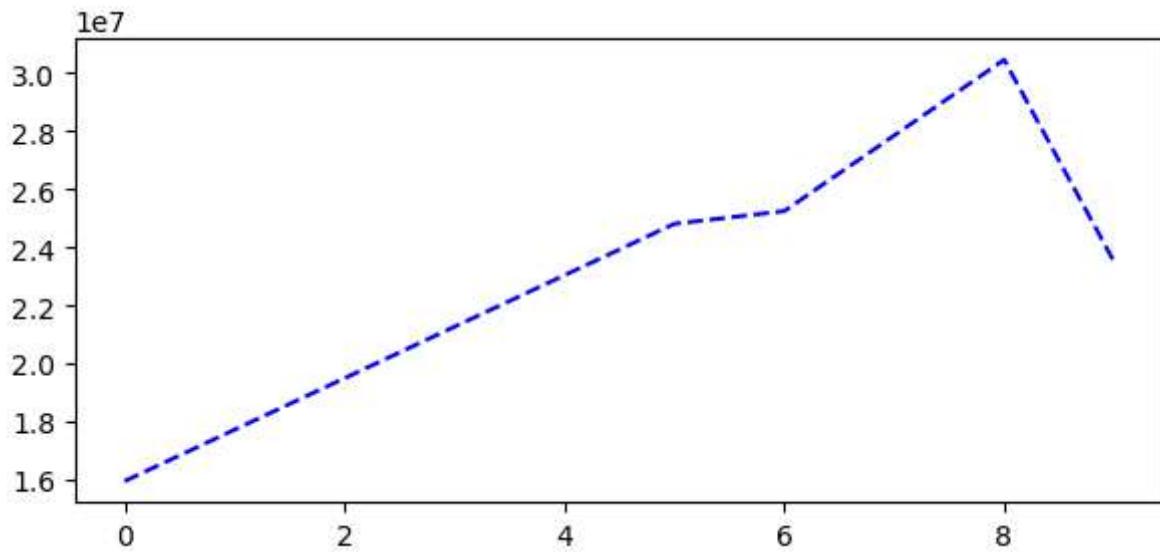
```
Out[121]: <matplotlib.lines.Line2D at 0x20a3c601970>
```



```
In [123... %matplotlib inline  
plt.rcParams['figure.figsize']=7,3 #7-width,3-height
```

```
In [125... plt.plot(Salary[0],c='Blue',ls='--')
```

```
Out[125... <matplotlib.lines.Line2D at 0x20a3c5c22a0>]
```



```
In [ ]:
```