```
1 import numpy as np
```

NUMPY MINI PROJECT 1

- 1 Inject data into array, find mean, median, IQR for Sachin, Rahul and India
- 2 Find the histogram of sachin's Scores with 10 bins
- 3 Find mean of sachin's scores grouped by 25 matches
- 4 Find mean of sachin's scores where he has scored a century
- 5 Find mean of sachin's scores when Rahul has scored less then 10
- 6 Find mean of sachin's scores based on which quartile India's score falls in
- 7 For every match findout who has scored more Sachin or Rahul
- 8 How many more runs does sachin score on an average after scoring X runs
- 9 How many matches did sachin take to score first 1000 runs and then next 1000

```
1 !head cric_data.tsv
```

	Sachin Tendulkar			Rahul Dravid	India
0	100	78	342		
1	11	62	191		
2	8	85	252		
3	71	24	307		
4	104	17	229		
5	18	104	246		
6	8	76	226		
7	86	74	288		
8	12	60	216		

```
1 cric_data = np.loadtxt("cric_data.tsv",skiprows=1)
```

```
1 cric_data
```

```
[167., 31., 54., 314.],
[168.,
      2., 52., 419.],
[169., 44., 9., 229.],
      47., 0., 133.],
[170.,
      6., 18., 228.],
[171.,
[172., 17., 3., 143.],
      35., 4., 116.],
[173.,
[174., 88.,
            6., 194.],
[175., 114., 16., 249.],
        7., 71., 319.],
[176.,
[177., 127., 64., 205.],
[178.,
      0.,
            7., 191.],
      45., 61., 213.],
[179.,
[180., 33., 1., 104.],
[181., 110.,
             7., 210.],
Γ1Ω2
      116
                  202 1
             a
```



| ±0∠., ±4∪.,

7.,

[183.,

[173,

[174,

[175, 114,[176,

[177, 127,

35,

88,

7,

4, 116],

6, 194], 16, 249],

71, 319],

64, 205],

ر[، عود ر، ت

57.],

0.,

```
26., 213.],
           [184.,
                    25.,
                     9.,
                          19., 158.],
           [185.,
           [186.,
                     2.,
                          63., 163.],
           [187.,
                    11.,
                           3., 166.],
                    17.,
                          46., 164.],
           [188.,
                          31., 238.],
           [189.,
                    14.,
                     1.,
                          12., 118.],
           [190.,
           [191.,
                    45.,
                          49., 189.],
                    94.,
                          4., 346.],
           [192.,
                         99., 390.],
           [193.,
                    28.,
           [194.,
                     4.,
                         47., 319.],
                          56., 276.],
           [195.,
                    62.,
                     1.,
                          73., 324.],
           [196.,
                     9.,
                          74., 213.],
           [197.,
                    67.,
                          31., 207.],
           [198.,
                          29., 158.],
           [199.,
                    10.,
           [200.,
                    99.,
                          92., 304.],
                          1., 199.],
                    55.,
           [201.,
                          0.,
           [202.,
                     0.,
                                  0.],
                         30., 195.],
           [203.,
                     1.,
           [204., 101.,
                          16., 207.],
           [205.,
                     2., 145., 352.],
           [206.,
                     1., 22., 225.],
           [207.,
                    16.,
                          31., 236.],
           [208., 140., 104., 301.],
                    23.,
                          20., 136.],
           [209.,
           [210., 113.,
                          13., 327.],
                   10.,
                          52., 296.],
           [211.,
                          31., 176.],
           [212.,
                     1.,
           [213.,
                   41.,
                          12., 201.],
           [214.,
                     1.,
                          50., 171.],
                    28.,
                          3., 191.],
           [215.,
           [216.,
                     2.,
                          9.,
                                11.],
                    22.,
                          53., 211.],
           [217.,
                    29.,
                          49., 225.],
           [218.,
                          21., 290.],
           [219.,
                     1.,
                          14., 101.],
           [220.,
                    25.,
           [221., 102.,
                          50., 470.],
                          22., 165.],
           [222.,
                     0.,
                    27.,
                          0., 192.],
           [223.,
                    40.,
                          0., 213.]])
           [224.,
1 #typecasting float to integer array
2 cric_data = cric_data.astype(dtype=int)
3 cric_data
           |167,
                   31,
                        54, 314|,
                    2,
                        52, 419],
           [168,
                   44,
                         9, 229],
           [169,
           [170,
                   47,
                         0, 133],
           [171,
                    6,
                        18, 228],
           [172,
                   17,
                         3, 143],
```

```
[179,
       45,
           61, 213],
[180,
       33,
             1, 104],
[181, 110,
             7, 210],
[182, 146,
             0, 392],
[183,
        7,
             0, 57],
[184,
       25,
            26, 213],
        9,
            19, 158],
[185,
[186]
        2,
            63, 163],
[187]
       11,
             3, 166],
[188]
       17,
            46, 164],
[189,
       14,
            31, 238],
[190,
        1,
            12, 118],
       45,
            49, 189],
[191,
[192,
       94,
            4, 346],
           99, 390],
       28,
[193,
        4,
            47, 319],
[194,
[195,
       62,
            56, 276],
[196,
        1,
           73, 324],
[197,
        9,
            74, 213],
            31, 207],
[198,
       67,
[199,
       10,
           29, 158],
       99,
            92, 304],
[200,
       55,
[201,
             1, 199],
             0,
[202,
        0,
[203,
        1,
            30, 195],
[204, 101,
            16, 207],
[205]
        2, 145, 352],
            22, 225],
[206,
        1,
            31, 236],
[207,
       16,
[208, 140, 104, 301],
[209,
       23, 20, 136],
[210, 113,
            13, 327],
           52, 296],
[211,
       10,
            31, 176],
[212,
        1,
            12, 201],
[213,
       41,
[214,
        1,
            50, 171],
       28,
             3, 191],
[215,
[216,
        2,
             9, 11],
            53, 211],
[217,
       22,
       29,
           49, 225],
[218,
            21, 290],
[219,
        1,
[220,
       25,
            14, 101],
[221, 102,
            50, 4701,
            22, 165],
[222,
        0,
[223,
       27,
             0, 192],
[224,
       40,
             0, 213]])
```

1 #converting into numpy array

```
2 cric_data = np.array(cric_data)
3 cric_data
   array([[
              0, 100,
                      78, 342],
              1,
                  11,
                       62, 191],
              2,
                       85, 252],
                  8,
                 71,
                       24, 307],
              3,
              4, 104,
                      17, 229],
              5,
                  18, 104, 246],
           6,
                   8,
                       76, 226],
```

```
7,
     86,
           74, 288],
 8,
      12,
           60, 216],
           12, 224],
 9,
      85,
      18,
10,
           63, 161],
       4, 107, 276],
11,
12,
       7,
           76, 283],
            4, 297],
13,
      37,
14,
      14,
            5, 139],
            33, 224],
15,
       0,
       4,
16,
            7, 178],
17,
       0,
            0,
                  0],
18,
      21,
           36, 193],
19,
           66, 231],
       1,
     62,
20,
             0, 134],
21,
       0, 123, 246],
22,
    138,
           39, 299],
23,
      38,
            9, 242],
24,
       2,
           11, 214],
     46,
25,
           14, 152],
26,
      65,
            0, 104],
27,
                   4],
       0,
            0,
28,
      39,
           26, 155],
29,
     48,
            4, 168],
    141,
30,
           48, 282],
31,
     62,
            7, 228],
      12,
32,
           73, 231],
33,
       1,
           86, 238],
34,
     41,
           32, 255],
35,
     11,
           82, 273],
           25, 143],
36,
       3,
37,
    186, 153, 345],
38,
           26, 134],
     11,
39,
      27,
             1, 292],
            6, 299],
      27,
40,
      51,
            3, 233],
41,
42,
     18,
            1, 332],
      32,
           39, 276],
43,
44,
    146,
           30, 264],
45,
       5,
           32, 213],
     45,
           84, 224],
46,
47,
    141,
           36, 306],
      12,
           31, 259],
48,
49,
            0, 141],
      65,
50,
      27,
           47, 155],
51,
       7,
           13, 183],
           49, 309],
52,
      16,
53,
       2,
           28, 208],
54,
      28,
            0, 124],
55,
       6,
           28, 208],
56,
    123,
           19, 305],
```

//M

1 Inject data into array, find mean, median, IQR for Sachin, Rahul and India

37,

14,

0,

4,

```
1 arSch = np.array(cric_data[:,1])
2 arSch
array([100, 11, 8, 71, 104, 18, 8, 86, 12, 85, 18, 4, 7,
```

1,

62,

0, 138,

38,

46,

21,

```
0,
 65,
              39,
                    48, 141,
                                  62,
                                        12,
                                                1,
                                                     41,
                                                            11,
                                                                    3, 186,
 27,
       27,
              51,
                    18,
                           32, 146,
                                          5,
                                               45, 141,
                                                            12,
                                                                   65,
                                                                         27,
                                                                                 7,
 16,
         2,
              28,
                      6, 123,
                                120,
                                         7,
                                                3,
                                                       0,
                                                            81,
                                                                    2,
                                                                         54,
                                                                              122,
  4,
       14,
               0,
                   100,
                           15,
                                   0,
                                        57,
                                               99,
                                                     37,
                                                            38,
                                                                   32,
                                                                         21,
                                                                                32,
 40,
               5,
                      8,
                             5,
                                   0,
                                        50,
                                               30,
                                                     37,
                                                            89,
                                                                    4,
                                                                         98,
                                                                                83,
         0,
 93,
         0,
              52,
                   152,
                            1,
                                   8,
                                        93,
                                               45,
                                                     26,
                                                             0,
                                                                          0,
                                                                    1,
                                                                                16,
                                               81,
                                                     14,
 47,
       89,
               3,
                      1,
                           53,
                                  16,
                                         0,
                                                            78,
                                                                    6,
                                                                        105,
                                                                              122,
  9,
         8,
              28,
                    35,
                           69,
                                 13,
                                        97,
                                               93,
                                                       2,
                                                            36,
                                                                   39,
                                                                          2,
                                                                                29,
                                                     79,
 12,
       19,
              34,
                      2,
                          100,
                                 44,
                                        82,
                                                0,
                                                             6,
                                                                    9,
                                                                          8,
                                                                                23,
 93,
                                        39,
                                               49,
       35,
              63,
                    74,
                            8, 117,
                                                     64,
                                                            43,
                                                                   72,
                                                                          5,
                                                                                17,
                                                             3,
                                                                 139,
  0,
              20,
                   141,
                           28,
                                 44,
                                        27,
                                               60,
                                                     68,
       65,
                                                                         31,
                                                                                 2,
                                 88,
                                                                         33,
 44,
       47,
               6,
                    17,
                           35,
                                       114,
                                                7,
                                                    127,
                                                             0,
                                                                   45,
                                                                              110,
         7,
                      9,
                                        17,
                                               14,
                                                            45,
                                                                   94,
146,
              25,
                            2,
                                 11,
                                                       1,
                                                                         28,
               9,
                                        55,
                    67,
                                 99,
                                                0,
                                                          101,
 62,
         1,
                           10,
                                                       1,
                                                                    2,
                                                                          1,
                                                                                16,
                    10,
                                 41,
       23,
            113,
                            1,
                                         1,
                                               28,
                                                       2,
                                                            22,
140,
                                                                   29,
                                                                          1,
                                                                                25,
102,
         0,
              27,
                    40])
```

```
//M
```

```
1 arRah = np.array(cric_data[:,2])
2 arRah
```

```
array([ 78,
                 62,
                        85,
                               24,
                                     17, 104,
                                                   76,
                                                         74,
                                                                60,
                                                                       12,
                                                                              63, 107,
                                                                                           76,
                                7,
                                                           0, 123,
                                                                                    11,
            4,
                  5,
                        33,
                                       0,
                                            36,
                                                   66,
                                                                       39,
                                                                               9,
                                                                32,
                  0,
                        26,
                                4,
                                     48,
                                             7,
                                                   73,
                                                         86,
                                                                       82,
                                                                              25,
                                                                                  153,
                                                                                           26,
            0,
                         3,
                                1,
                                     39,
                                            30,
                                                   32,
                                                         84,
                                                                36,
                                                                       31,
                                                                               0,
                                                                                    47,
                                                                                           13,
            1,
                  6,
          49,
                 28,
                         0,
                               28,
                                     19,
                                            13,
                                                   14,
                                                         11,
                                                               103,
                                                                       43,
                                                                               5,
                  5,
                                4,
                                     53,
                                                    7,
                                                         74,
                                                                71,
                                                                       54,
            0,
                        30,
                                            60,
                                                                             13,
                                                                                    69,
                                                                                           33,
                         8,
                               36,
                                                           0,
          29,
                  2,
                                     51,
                                                                22,
                                                                       39,
                                                                            104,
                                                                                    44,
                                             8,
                                                   62,
                                                                                            1,
            2,
                  0,
                        17,
                                0,
                                     14,
                                            62,
                                                   15,
                                                         68,
                                                                17,
                                                                        0,
                                                                              22,
                                                                                           29,
                                                           4,
          60,
                 34,
                        65,
                                3,
                                      7,
                                                    0,
                                                                53,
                                                                        5,
                                                                              23,
                                                                                    82,
                                                                                            3,
                                            16,
            0,
                 20,
                        21,
                               80,
                                     22,
                                             8,
                                                   18,
                                                         24,
                                                                50,
                                                                        1,
                                                                              42,
                                                                                    61,
                                                                                            0,
                                                           0,
                                                                13,
            6,
                 64,
                         9,
                               46,
                                      0,
                                             0,
                                                    0,
                                                                        0,
                                                                              72,
                                                                                    12,
                                                                        0,
          79,
                                     56,
                                            21,
                                                   58,
                                                           8,
                                                                 0,
                                                                               7,
                 18,
                        16,
                               16,
                                                                                    13,
                                                                                           77,
          29,
                 20,
                        90,
                               26,
                                     54,
                                                   78,
                                                         57,
                                                                59,
                                                                       10,
                                                                                    54,
                                            17,
                                                                              15,
                                                                                           52,
                                3,
                                      4,
                                                         71,
                                                                        7,
            9,
                  0,
                        18,
                                             6,
                                                   16,
                                                                64,
                                                                              61,
                                                                                     1,
                                                                                            7,
                        26,
                                                         31,
                                                                                    99,
            0,
                  0,
                               19,
                                     63,
                                             3,
                                                   46,
                                                                12,
                                                                       49,
                                                                               4,
                                                                                           47,
                 73,
                                     29,
                                            92,
          56,
                        74,
                               31,
                                                    1,
                                                           0,
                                                                30,
                                                                       16,
                                                                           145,
                                                                                    22,
                                                                                           31,
                                                           3,
         104,
                 20,
                        13,
                               52,
                                     31,
                                            12,
                                                   50,
                                                                 9,
                                                                       53,
                                                                              49,
                                                                                    21,
          50,
                 22,
                         0,
                                01)
```

```
1 arInd = np.array(cric_data[:,3])
2 arInd
```

```
array([342, 191, 252, 307, 229, 246, 226, 288, 216, 224, 161, 276, 283,
                             0, 193, 231, 134, 246, 299, 242, 214, 152,
       297, 139, 224, 178,
              4, 155, 168, 282, 228, 231, 238, 255, 273, 143, 345, 134,
       292, 299, 233, 332, 276, 264, 213, 224, 306, 259, 141, 155, 183,
       309, 208, 124, 208, 305, 273, 186, 163, 239, 274, 182, 256, 227,
       157, 353, 271, 211, 141, 243, 499, 229, 234, 259, 242, 223, 184,
       125, 195, 154, 142, 197, 213, 256, 197, 177, 167, 366, 269, 292,
              0, 199, 319, 245, 274, 208, 201, 275, 134,
       218,
                                                           68, 149, 216,
       407, 302, 197, 222, 224, 321,
                                       0, 162, 221, 204, 213, 286, 272,
       382, 229, 175, 360, 256, 165, 335, 188, 146, 113, 241, 211, 225,
       35, 163, 200, 176, 269, 284, 175,
                                          27, 282, 141, 229, 213, 205,
             88, 284, 207, 224, 204, 280, 197, 205, 230, 323, 209, 210,
       162, 272, 251, 286, 228, 148, 272, 309, 202, 136, 281, 314, 419,
            133, 228, 143, 116, 194, 249, 319, 205, 191, 213, 104, 210,
             57, 213, 158, 163, 166, 164, 238, 118, 189, 346, 390, 319,
       392,
       276, 324, 213, 207, 158, 304, 199,
                                            0, 195, 207, 352, 225, 236,
```

```
301, 136, 327, 296, 176, 201, 171, 191, 11, 211, 225, 290, 101, 470, 165, 192, 213])
```

mean for Sachin, Rahul and India

```
1 SchMean = np.mean(arSch)
2 SchMean
```

39.875555555556

```
1 RahMean = np.mean(arRah)
```

2 RahMean

32.0622222222225



```
1 IndMean = np.mean(arInd)
```

2 IndMean

220.7955555555555

Median for Sachin, Rahul and India

```
1 SchMed = np.median(arSch)
```

2 SchMed

27.0

```
1 RahMed = np.median(arRah)
```

2 RahMed

22.0

```
1 IndMed = np.median(arInd)
```

2 IndMed

216.0

IQR for Sachin, Rahul and India

```
1 SchIQR = np.percentile(arSch,75)-np.percentile(arSch,25)
2 SchIQR
```

57.0

```
1 RahIQR = np.percentile(arRah,75)-np.percentile(arRah,25)
2 RahIQR
```

46.0

```
1 IndIQR = np.percentile(arInd,75)-np.percentile(arInd,25)
2 IndIQR
98.0
```

*2 Find the histogram of sachin's Scores with 10 bins *

3 Find mean of sachin's scores grouped by 25 matches

```
1 k= 9 #225/25
2 i=0
3 j=25
4 SchM25 =[]
5 for m in range(k) :
6    Mean=np.mean(arSch[i:j])
7    SchM25.append(Mean)
8    i=i+25
9    j=j+25
10 SchM25
```

[33.96, 49.4, 38.48, 40.16, 39.36, 38.2, 44.6, 39.52, 35.2]

4 Find mean of sachin's scores where he has scored a century

```
1 arSch100 = np.array([ ele for ele in arSch if ele >=100])
2 arSch100

array([100, 104, 138, 141, 186, 146, 141, 123, 120, 122, 100, 152, 105, 122, 100, 117, 141, 139, 114, 127, 110, 146, 101, 140, 113, 102])

1 arSch100Mean= np.mean(arSch100)
2 arSch100Mean

125.0
```

5 Find mean of sachin's scores when Rahul has scored less then 10

```
1 SchRl10=[]
2 for i in range(len(arSch)) :
```

```
э т (arkan[i]אנט):
 4
           x=arSch[i]
 5
           SchRl10.append(x)
   arSchRl10 = np.array(SchRl10)
 6
 7
    arSchRl10
    array([ 37, 14,
                         0, 62, 38, 65,
                   4,
                                           0,
                                              48,
                                                   62,
                                                        27,
                                                            27,
                        2, 54, 4, 14, 100, 57,
           18, 65, 28,
                                                                30,
                                                   0,
                                                        5,
           83, 93, 0, 152,
                                 1, 53,
                                             81,
                            0,
                                           0,
                                                   78, 122,
                                                             9, 13,
           36, 29, 12, 34, 100, 44, 82,
                                           0,
                                              6, 49, 64,
                                                            43, 72,
                                 0, 33, 110, 146,
                                                   7,
                         35, 88,
           44, 47, 17,
                                                        11,
                                                            94,
                                                                55,
            0,
               28,
                   2,
                        27,
                            40])
 1 arSchRl10Mean = np.mean(arSchRl10)
 2 arSchRl10Mean
```

40.74285714285714



6 Find mean of sachin's scores based on which quartile India's score falls in

```
1 IndIQR0 = np.percentile(arInd,0)
2 IndIQR0
    0.0
1 IndIQR1 = np.percentile(arInd,25)
2 IndIQR1
    175.0
1 IndIQR2 = np.percentile(arInd,50)
2 IndIQR2
    216.0
1 IndIQR3 = np.percentile(arInd,75)
2 IndIQR3
    273.0
1 IndIQR4 = np.percentile(arInd,100)
2 IndIQR4
    499.0
1 arSchIQR1 = []
2 arSchIQR2 = []
3 \operatorname{arSchIQR3} = []
4 \operatorname{arSchIQR4} = []
5 for i in range(len(arSch)) :
      if(arInd[i] > IndIQRO and arInd[i] < IndIQR1) :</pre>
```

```
7
           x= arSch[i]
 8
           arSchIQR1.append(x)
 9
       elif(arInd[i] > IndIQR1 and arInd[i] < IndIQR2) :</pre>
           x= arSch[i]
10
11
           arSchIQR2.append(x)
      elif(arInd[i] > IndIQR2 and arInd[i] < IndIQR3) :</pre>
12
13
           x= arSch[i]
           arSchIQR3.append(x)
14
       elif(arInd[i] > IndIQR3 and arInd[i] < IndIQR4) :</pre>
15
16
           x= arSch[i]
17
           arSchIQR4.append(x)
18 arSchIQR1 = np.array(arSchIQR1)
19 arSchIQR2 = np.array(arSchIQR2)
20 arSchIQR3 = np.array(arSchIQR3)
21 arSchIQR4 = np.array(arSchIQR4)
22 print(arSchIQR1)
23 print("_
24 print(arSchIQR2)
25 print("
26 print(arSchIQR3)
27 print("_
                            ")
28 print(arSchIQR4)
     [18 14 62 46 65 0 39 48
                               3 11 65 27 28 3 4 15 40
                                                           5 8 89
                                                                     0
                                                                        1
      13 2 36 12 19 0 6 35
                               0 44 3 47 17 35 33 7 9 2 11 17
                                                                     1 10 23 1
       2 25 0]
               21
                         5
                            7
                                 2
                                     6
                                         7
                                             2 100
                                                     32
                                                              5
                                                                     30
                                                                         37
                                                                              52
     <sup>[</sup> 11
                    2
                                                          0
                                                                  0
                                    34
       93
          45
                3
                   78
                         6
                           93
                                 2
                                         2
                                                23
                                                     74 117
                                                             49
                                                                      5
                                                                          17
                                             8
                                                                 64
                                                                              68
       88 127
                0
                   45 110
                            25
                               45
                                     9
                                        67
                                            55
                                                  1 101
                                                          1
                                                             41
                                                                 28
                                                                     22
                                                                              40]
       8 104
               18
                    8 85
                            0
                                 1
                                     0
                                        38
                                            62
                                                12
                                                      1
                                                         41
                                                             51 146
                                                                    45
                                                                         12
                                                                               0
       54 122
               0
                    0
                       99
                                    32
                                                98
                                                     93
                                                                     14 122
                            37
                                38
                                        21
                                            50
                                                          1
                                                              1
                                                                 53
                                                                               8
       69
          39
              29 100
                        9
                             8
                               43
                                    65
                                        20
                                           28
                                                27
                                                     44
                                                          6 114
                                                                 14
                                                                              29]
     [100
           71 86
                    4
                       7
                            37 138 141 186
                                            27
                                                27
                                                    18
                                                         32 141
                                                                 16 123
                                                                         81
                                                                              14
           83 152
                    8
                       26
                           47 89
                                    16 105
                                             9
                                                35
                                                     97
                                                         44
                                                             79
                                                                 93 63
                                                                              72
                             7 146
      141
           60 139 31
                        2
                                    94 28
                                             4 62
                                                      1
                                                         99
                                                              2 140 113
                                                                         10
                                                                               1
      102]
 1 SchMeanIndIQR1 = np.mean(arSchIQR1)
 2 SchMeanIndIQR2 = np.mean(arSchIQR2)
 3 SchMeanIndIQR3 = np.mean(arSchIQR3)
 4 SchMeanIndIQR4 = np.mean(arSchIQR4)
 1 SchMeanIndIQR1
     21.215686274509803
 1 SchMeanIndIQR2
     35.851851851851855
```

1 SchMeanIndIQR3

39.555555555556

```
1 SchMeanIndIQR4
```

63.49090909090909

7 For every match findout who has scored more Sachin or Rahul

```
1 SachVsRah = []
2 #1 if Sachin more, 0 if Rahul More
3 for i in range(0,len(arSch)) :
     if arSch[i]>arRah[i] :
5
         SachVsRah.append(1)
6
     else:
7
         SachVsRah.append(0)
8 SachVsRah= np.array(SachVsRah)
9 SachVsRah
   array([1, 0, 0, 1, 1, 0, 0, 1, 0, 1, 0, 0, 0, 1, 1, 0, 0, 0, 0, 0, 1, 0,
           1, 1, 0, 1, 1, 0, 1, 1, 1, 1, 0, 0, 1, 0, 0, 1, 0, 1, 1, 1, 1, 0,
          1, 0, 0, 1, 0, 1, 0, 0, 0, 0, 1, 0, 1, 1, 0, 0, 0, 1, 0, 1, 1, 1,
          1, 0, 1, 0, 0, 1, 1, 0, 0, 1, 0, 0, 1, 0, 0, 0, 0, 0, 0, 1, 1, 1,
          0, 1, 1, 1, 0, 1, 1, 0, 0, 1, 0, 1, 0, 0, 0, 0, 0, 1, 0, 0, 1, 0,
          0, 1, 0, 1, 0, 1, 1, 1, 0, 1, 0, 1, 1, 1, 1, 0, 1, 0, 0, 1, 1, 0,
          1, 0, 1, 1, 1, 0, 1, 1, 0, 0, 0, 1, 1, 1, 1, 0, 1, 0, 1, 1, 1, 1,
          0, 0, 0, 1, 0, 1, 0, 1, 0, 1, 1, 0, 1, 0, 0, 1, 1, 0, 1, 1, 1, 1,
          0, 1, 0, 0, 1, 1, 1, 1, 0, 0, 0, 1, 0, 0, 0, 0, 1, 0, 0, 1, 0, 0,
          1, 0, 1, 1, 0, 0, 1, 0, 0, 0, 1, 1, 1, 0, 0, 1, 0, 1, 0, 0, 0, 0,
          1, 1, 0, 1, 1])
1 np.sum(SachVsRah)
```

111

Out of 225 matches

Sachin Scored more than Rahul in 111 matches

Rahul Scored more than Sachin in 114 matches

8 How many more runs does sachin score on an average after scoring X runs

```
1 #if 10 , how many more runs he score ' #20, 30
2 arSchsort = np.sort(arSch)
3 arSchsort
    array([
                                                                                    0,
              0,
                    0,
                                0,
                                     0,
                                           0,
                                                 0,
                                                       0,
                                                                  0,
                                                                              0,
                    0,
              0,
                          0,
                                0,
                                           1,
                                                 1,
                                                       1,
                                                             1,
                                                                        1,
                                                                              1,
                                                                                    1,
               1,
                    1,
                          1,
                                1,
                                           2,
                                                 2,
                                                                        2,
                                                                                    2,
                    3,
                          3,
                                      3,
                                           4,
                                                       4,
                                                                                    5,
                                3,
                                                 4,
```

```
5,
            6,
                                                                8,
     6,
                6,
                      6,
                            7,
                                 7,
                                      7,
                                           7,
                                                 7,
                                                      8,
                                                           8,
                                 9,
 8,
      8,
           8,
                8,
                      9,
                            9,
                                      9,
                                          10,
                                                10,
                                                     11,
                                                          11, 11,
 11,
     12,
           12,
                12,
                     12,
                           13,
                                14,
                                     14,
                                          14,
                                                14,
                                                     15,
                                                          16,
                                                                16,
16,
     16,
           17,
                17,
                     17,
                           18,
                                18,
                                    18,
                                          19,
                                                20,
                                                     21,
                                                          21,
                                                                22,
                                                                28,
23,
     23,
          25,
                25,
                     26,
                           27,
                                27,
                                     27,
                                          27,
                                                27,
                                                     28,
                                                          28,
 28,
     28,
           29,
                29,
                     30,
                           31,
                                32,
                                     32,
                                          32,
                                                33,
                                                     34,
                                                          35,
35,
                37,
                                38,
                                     39,
                                          39,
                                                39,
     36,
           37,
                     37,
                           38,
                                                     40,
                                                          40,
41, 43,
           44,
                44,
                     44,
                           45,
                                45,
                                     45,
                                          45,
                                                46,
                                                     47,
                                                          47,
49,
      50,
                     53,
                                     57,
           51,
                52,
                           54,
                                55,
                                          60,
                                                62,
                                                     62,
                                                          62,
64,
     65,
           65,
                65,
                     67,
                           68,
                                69,
                                     71,
                                          72,
                                                74,
                                                     78,
                                                          79,
                                                          93,
81, 82,
           83,
                85,
                     86,
                           88, 89,
                                     89,
                                          93,
                                                93,
                                                     93,
               99, 100, 100, 100, 101, 102, 104, 105, 110, 113,
     98,
          99,
114, 117, 120, 122, 122, 123, 127, 138, 139, 140, 141, 141, 141,
146, 146, 152, 186])
```

```
1 SchFreqCounter = np.histogram(arSchsort,bins=[0,20,40,60,80,100,120,140,160,180,200]
2 SchFreqCounter
                                               7,
   (array([100,
                40,
                      24,
                          17,
                               18, 11,
                                          7,
    array([ 0, 20, 40, 60, 80, 100, 120, 140, 160, 180, 200]))
1 SchFreqCounterCount = SchFreqCounter.count
2 SchFreqCounterCount
   <function tuple.count>
1 SchFreqCounterCount = np.array([100, 40, 24, 17, 18, 11,
                                                                              1])
                                                              7, 7,
                                                                         0,
2 SchFreqCounterCount
   array([100, 40, 24, 17, 18, 11,
                                         7,
                                              7,
                                                   0,
                                                        1])
1 np.sum(SchFreqCounterCount)
   225
   SchRFraw=(SchFreqCounterCount/(np.sum(SchFreqCounterCount)))
2
   SchRFraw
   array([0.44444444, 0.17777778, 0.10666667, 0.07555556, 0.08
          0.0488889, 0.03111111, 0.03111111, 0. , 0.00444444])
   SchRFbinend= np.array([0,20,40,60,80,100,120,140,160,180])
1
2
   SchRFbinend
   array([ 0, 20, 40, 60, 80, 100, 120, 140, 160, 180])
   (SchRFraw*SchRFbinend)
                    , 3.5555556, 4.26666667, 4.53333333, 6.4
   array([0.
          4.88888889, 3.73333333, 4.35555556, 0.
                                                                   1)
                                                       , 0.8
```

1 (SchRFraw*SchRFbinend)+SchRFbinend

```
array([ 0. , 23.5555556, 44.26666667, 64.53333333, 86.4 , 104.88888889, 123.73333333, 144.35555556, 160. , 180.8 ])
```

9 How many matches did sachin take to score first 1000 runs and then next 1000

```
1 cumsumSch = np.cumsum(arSch)
2 cumsumSch
   array([ 100,
                                    294,
                  111,
                        119,
                              190,
                                          312,
                                                320,
                                                      406,
                                                            418,
                                                                  503.
                                                                        521.
            525,
                  532,
                       569,
                             583,
                                    583,
                                         587,
                                               587,
                                                     608,
                                                           609,
                                                                 671,
                                                                       671,
                  847,
                       849, 895,
                                    960, 960, 999, 1047, 1188, 1250, 1262,
           1263, 1304, 1315, 1318, 1504, 1515, 1542, 1569, 1620, 1638, 1670,
           1816, 1821, 1866, 2007, 2019, 2084, 2111, 2118, 2134, 2136, 2164,
           2170, 2293, 2413, 2420, 2423, 2423, 2504, 2506, 2560, 2682, 2686,
           2700, 2700, 2800, 2815, 2815, 2872, 2971, 3008, 3046, 3078, 3099,
           3131, 3171, 3171, 3176, 3184, 3189, 3189, 3239, 3269, 3306, 3395,
           3399, 3497, 3580, 3673, 3673, 3725, 3877, 3878, 3886, 3979, 4024,
          4050, 4050, 4051, 4051, 4067, 4114, 4203, 4206, 4207, 4260, 4276,
          4276, 4357, 4371, 4449, 4455, 4560, 4682, 4691, 4699, 4727, 4762,
          4831, 4844, 4941, 5034, 5036, 5072, 5111, 5113, 5142, 5154, 5173,
           5207, 5209, 5309, 5353, 5435, 5435, 5514, 5520, 5529, 5537, 5560,
           5653, 5688, 5751, 5825, 5833, 5950, 5989, 6038, 6102, 6145, 6217,
           6222, 6239, 6239, 6304, 6324, 6465, 6493, 6537, 6564, 6624, 6692,
           6695, 6834, 6865, 6867, 6911, 6958, 6964, 6981, 7016, 7104, 7218,
           7225, 7352, 7352, 7397, 7430, 7540, 7686, 7693, 7718, 7727, 7729,
           7740, 7757, 7771, 7772, 7817, 7911, 7939, 7943, 8005, 8006, 8015,
          8082, 8092, 8191, 8246, 8246, 8247, 8348, 8350, 8351, 8367, 8507,
          8530, 8643, 8653, 8654, 8695, 8696, 8724, 8726, 8748, 8777, 8778,
           8803, 8905, 8905, 8932, 8972])
1 np.histogram(cumsumSch,bins=[0,1000,2000,3000,4000,5000,6000,7000,8000,9000])
```

```
1 hp. h13 togi am(tumsumstr, b1h3-[0,1000,2000,3000,4000,3000,0000,7000,0000,
```

```
(array([29, 18, 26, 25, 26, 26, 23, 22, 30]),
array([ 0, 1000, 2000, 3000, 4000, 5000, 6000, 7000, 8000, 9000]))
```

✓ 0s completed at 8:14 PM

