

Week 8 Live Coding Solutions

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Problem 1

Write a function `findMedian(A,B)` that accept two sorted list A and B of the same size and function return median of the sorted merged list of A and B. write a solution of order $O(\log n)$.

- If length of sorted merged list is odd then median is middle element.
- If length of sorted merged list is even then median is average of two middle elements.

Sample Input

```
1 | [1,3,5,7]
2 | [2,4,5,8]
```

Output

```
1 | 4.5
```

Sample Input

```
1 | [1,2,3,4,5,6]
2 | [7,8,9,10,12,13]
```

Output

```
1 | 6.5
```

Solution

Solution Code

```
1 def median(A,B,sA,lA,sB,lB):
2     n = lA - sA + 1
3     mid = n // 2
4     midA = sA + mid
5     if n % 2 == 0:
6         midB = sB + mid - 1
7     else:
8         midB = sB + mid
9     if n == 1:
10        return (A[sA] + B[sB]) / 2
11    elif n == 2:
12        return (max(A[sA], B[sB]) + min(A[lA], B[lB])) / 2
13    elif A[midA] == B[midB]:
14        return (A[midA] + B[midB]) / 2
15    elif A[midA] > B[midB]:
16        return median(A, B, sA, midA, midB, lB)
17    elif A[midA] < B[midB]:
18        return median(A, B, midA, lA, sB, midB)
19
20 def findMedian(A,B):
21     return median(A,B,0,len(A)-1,0,len(B)-1)
```

Suffix code(Visible)

```
1 def medianideal(A,B,sA,lA,sB,lB):
2     n = lA - sA + 1
3     mid = n // 2
4     midA = sA + mid
5     if n % 2 == 0:
6         midB = sB + mid - 1
7     else:
8         midB = sB + mid
9     if n == 1:
10        return (A[sA] + B[sB]) / 2
11    elif n == 2:
12        return (max(A[sA], B[sB]) + min(A[lA], B[lB])) / 2
13    elif A[midA] == B[midB]:
14        return (A[midA] + B[midB]) / 2
15    elif A[midA] > B[midB]:
16        return medianideal(A, B, sA, midA, midB, lB)
17    elif A[midA] < B[midB]:
18        return medianideal(A, B, midA, lA, sB, midB)
19
20 def findMedianideal(A,B):
21     return medianideal(A,B,0,len(A)-1,0,len(B)-1)
22
23
24 A = eval(input())
25 B = eval(input())
26
```

```

27 import time
28 t1 = time.perf_counter()
29 res = findMedian(A,B)
30 elapsedStudent = time.perf_counter() - t1
31
32 t1 = time.perf_counter()
33 res1 = findMedianideal(A,B)
34 elapsedIdeal = time.perf_counter() - t1
35
36 timeout = elapsedIdeal
37 if (elapsedStudent > timeout*3):
38     print("Timed Out. Write efficient code. Elapsed: " +
39         str(elapsedStudent))
40 else:
41     print(res)

```

Public Test case

Input 1

```

1 | [1,3,5,7]
2 | [2,4,5,8]

```

Output

```

1 | 4.5

```

Input 2

```

1 | [1,2,3,4,5,6]
2 | [7,8,9,10,12,13]

```

Output

```

1 | 6.5

```

Input 3

1 [0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, 142, 144, 146, 148, 150, 152, 154, 156, 158, 160, 162, 164, 166, 168, 170, 172, 174, 176, 178, 180, 182, 184, 186, 188, 190, 192, 194, 196, 198, 200, 202, 204, 206, 208, 210, 212, 214, 216, 218, 220, 222, 224, 226, 228, 230, 232, 234, 236, 238, 240, 242, 244, 246, 248, 250, 252, 254, 256, 258, 260, 262, 264, 266, 268, 270, 272, 274, 276, 278, 280, 282, 284, 286, 288, 290, 292, 294, 296, 298, 300, 302, 304, 306, 308, 310, 312, 314, 316, 318, 320, 322, 324, 326, 328, 330, 332, 334, 336, 338, 340, 342, 344, 346, 348, 350, 352, 354, 356, 358, 360, 362, 364, 366, 368, 370, 372, 374, 376, 378, 380, 382, 384, 386, 388, 390, 392, 394, 396, 398, 400, 402, 404, 406, 408, 410, 412, 414, 416, 418, 420, 422, 424, 426, 428, 430, 432, 434, 436, 438, 440, 442, 444, 446, 448, 450, 452, 454, 456, 458, 460, 462, 464, 466, 468, 470, 472, 474, 476, 478, 480, 482, 484, 486, 488, 490, 492, 494, 496, 498, 500, 502, 504, 506, 508, 510, 512, 514, 516, 518, 520, 522, 524, 526, 528, 530, 532, 534, 536, 538, 540, 542, 544, 546, 548, 550, 552, 554, 556, 558, 560, 562, 564, 566, 568, 570, 572, 574, 576, 578, 580, 582, 584, 586, 588, 590, 592, 594, 596, 598, 600, 602, 604, 606, 608, 610, 612, 614, 616, 618, 620, 622, 624, 626, 628, 630, 632, 634, 636, 638, 640, 642, 644, 646, 648, 650, 652, 654, 656, 658, 660, 662, 664, 666, 668, 670, 672, 674, 676, 678, 680, 682, 684, 686, 688, 690, 692, 694, 696, 698, 700, 702, 704, 706, 708, 710, 712, 714, 716, 718, 720, 722, 724, 726, 728, 730, 732, 734, 736, 738, 740, 742, 744, 746, 748, 750, 752, 754, 756, 758, 760, 762, 764, 766, 768, 770, 772, 774, 776, 778, 780, 782, 784, 786, 788, 790, 792, 794, 796, 798, 800, 802, 804, 806, 808, 810, 812, 814, 816, 818, 820, 822, 824, 826, 828, 830, 832, 834, 836, 838, 840, 842, 844, 846, 848, 850, 852, 854, 856, 858, 860, 862, 864, 866, 868, 870, 872, 874, 876, 878, 880, 882, 884, 886, 888, 890, 892, 894, 896, 898, 900, 902, 904, 906, 908, 910, 912, 914, 916, 918, 920, 922, 924, 926, 928, 930, 932, 934, 936, 938, 940, 942, 944, 946, 948, 950, 952, 954, 956, 958, 960, 962, 964, 966, 968, 970, 972, 974, 976, 978, 980, 982, 984, 986, 988, 990, 992, 994, 996, 998, 1000, 1002, 1004, 1006, 1008, 1010, 1012, 1014, 1016, 1018, 1020, 1022, 1024, 1026, 1028, 1030, 1032, 1034, 1036, 1038, 1040, 1042, 1044, 1046, 1048, 1050, 1052, 1054, 1056, 1058, 1060, 1062, 1064, 1066, 1068, 1070, 1072, 1074, 1076, 1078, 1080, 1082, 1084, 1086, 1088, 1090, 1092, 1094, 1096, 1098, 1100, 1102, 1104, 1106, 1108, 1110, 1112, 1114, 1116, 1118, 1120, 1122, 1124, 1126, 1128, 1130, 1132, 1134, 1136, 1138, 1140, 1142, 1144, 1146, 1148, 1150, 1152, 1154, 1156, 1158, 1160, 1162, 1164, 1166, 1168, 1170, 1172, 1174, 1176, 1178, 1180, 1182, 1184, 1186, 1188, 1190, 1192, 1194, 1196, 1198, 1200, 1202, 1204, 1206, 1208, 1210, 1212, 1214, 1216, 1218, 1220, 1222, 1224, 1226, 1228, 1230, 1232, 1234, 1236, 1238, 1240, 1242, 1244, 1246, 1248, 1250, 1252, 1254, 1256, 1258, 1260, 1262, 1264, 1266, 1268, 1270, 1272, 1274, 1276, 1278, 1280, 1282, 1284, 1286, 1288, 1290, 1292, 1294, 1296, 1298, 1300, 1302, 1304, 1306, 1308, 1310, 1312, 1314, 1316, 1318, 1320, 1322, 1324, 1326, 1328, 1330, 1332, 1334, 1336, 1338, 1340, 1342, 1344, 1346, 1348, 1350, 1352, 1354, 1356, 1358, 1360, 1362, 1364, 1366, 1368, 1370, 1372, 1374, 1376, 1378, 1380, 1382, 1384, 1386, 1388, 1390, 1392, 1394, 1396, 1398, 1400, 1402, 1404, 1406, 1408, 1410, 1412, 1414, 1416, 1418, 1420, 1422, 1424, 1426, 1428, 1430, 1432, 1434, 1436, 1438, 1440, 1442, 1444, 1446, 1448, 1450, 1452, 1454, 1456, 1458, 1460, 1462, 1464, 1466, 1468, 1470, 1472, 1474, 1476, 1478, 1480, 1482, 1484, 1486, 1488, 1490, 1492, 1494, 1496, 1498, 1500, 1502, 1504, 1506, 1508, 1510, 1512, 1514, 1516, 1518, 1520, 1522, 1524, 1526, 1528, 1530, 1532, 1534, 1536, 1538, 1540, 1542, 1544, 1546, 1548, 1550, 1552, 1554, 1556, 1558, 1560, 1562, 1564, 1566, 1568, 1570, 1572, 1574, 1576, 1578, 1580,

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Output

Private Test case

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Output

1	1.0
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Output

1 | 4999.5

Input 3

```
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  143, 145, 147, 149, 151, 153, 155, 157, 159, 161, 163, 165, 167, 169, 171,
  173, 175, 177, 179, 181, 183, 185, 187, 189, 191, 193, 195, 197, 199]
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  142, 144, 146, 148, 150, 152, 154, 156, 158, 160, 162, 164, 166, 168, 170,
  172, 174, 176, 178, 180, 182, 184, 186, 188, 190, 192, 194, 196, 198]
```

Output

```
1 99.5
```

Problem 2

Write a function `KthElement(A,B,k)` that accept two sorted list A and B of the size `n` and `m` respectively and a integer value `k` and function return Kth element in the sorted merged list of A and B from start. write a solution of order $O(\log n + \log m)$.

Sample Input

```
1 [1,3,5,7]
2 [2,4,5,8]
3 3
```

Output

```
1 3
```

Sample Input

```
1 [1,2,3,4]
2 [7,8,9,10,12,13]
3 4
```

Output

```
1 4
```

Solution

Solution Code

```
1 def kth(arr1, arr2, n, m, k):
2     if n == 1 or m == 1:
3         if m == 1:
4             arr2, arr1 = arr1, arr2
5             n, m = m, n
6         if k == 1:
7             return min(arr1[0], arr2[0])
8         elif k == m + n:
9             return max(arr1[0], arr2[m-1])
10        else:
11            if arr2[k - 2] > arr1[0]:
12                return arr2[k - 2]
13            else:
14                return min(arr1[0], arr2[k - 1])
15
16    mid1 = (n - 1)//2
17    mid2 = (m - 1)//2
18
19    if k > mid1 + mid2 + 1 :
20        if arr1[mid1] < arr2[mid2]:
21            return kth(arr1[mid1 + 1:], arr2, n - mid1 - 1, m, k - mid1 - 1)
22        else:
23            return kth(arr1, arr2[mid2 + 1:], n, m - mid2 - 1, k - mid2 - 1)
24    else:
25        if arr1[mid1] < arr2[mid2]:
26            return kth(arr1, arr2[:mid2 + 1], n, mid2 + 1, k)
27        else:
28            return kth(arr1[:mid1 + 1], arr2, mid1 + 1, m, k)
29 def KthElement(A,B,k):
30     return kth(A,B,len(A),len(B),k)
```

Suffix code(Visible)

```
1 def kth1(arr1, arr2, n, m, k):
2     if n == 1 or m == 1:
3         if m == 1:
4             arr2, arr1 = arr1, arr2
5             n, m = m, n
6         if k == 1:
7             return min(arr1[0], arr2[0])
8         elif k == m + n:
9             return max(arr1[0], arr2[m-1])
10        else:
11            if arr2[k - 2] > arr1[0]:
12                return arr2[k - 2]
13            else:
14                return min(arr1[0], arr2[k - 1])
15
16    mid1 = (n - 1)//2
17    mid2 = (m - 1)//2
```

```

18
19     if mid1+mid2+1 < k:
20         if arr1[mid1] < arr2[mid2]:
21             return kth1(arr1[mid1 + 1:], arr2, n - mid1 - 1, m, k - mid1 -
1)
22         else:
23             return kth1(arr1, arr2[mid2 + 1:], n, m - mid2 - 1, k - mid2 -
1)
24     else:
25         if arr1[mid1] < arr2[mid2]:
26             return kth1(arr1, arr2[:mid2 + 1], n, mid2 + 1, k)
27         else:
28             return kth1(arr1[:mid1 + 1], arr2, mid1 + 1, m, k)
29 def kthElement1(A,B,k):
30     return kth1(A,B,len(A),len(B),k)
31
32
33
34 A = eval(input())
35 B = eval(input())
36 k = int(input())
37 import time
38 t1 = time.perf_counter()
39 res = KthElement(A,B,k)
40 elapsedStudent = time.perf_counter() - t1
41
42 t1 = time.perf_counter()
43 res1 = KthElement1(A,B,k)
44 elapsedIdeal = time.perf_counter() - t1
45
46 timeout = elapsedIdeal
47 if (elapsedStudent > timeout*3):
48     print("Timed Out. Write efficient code. Elapsed: " +
str(elapsedStudent))
49 else:
50     print(res)

```

Public Test case

Input 1

```

1 | [1,3,5,7]
2 | [2,4,5,8]
3 | 3

```

Output

```

1 | 3

```

Input 2

1 [0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, 142, 144, 146, 148, 150, 152, 154, 156, 158, 160, 162, 164, 166, 168, 170, 172, 174, 176, 178, 180, 182, 184, 186, 188, 190, 192, 194, 196, 198, 200, 202, 204, 206, 208, 210, 212, 214, 216, 218, 220, 222, 224, 226, 228, 230, 232, 234, 236, 238, 240, 242, 244, 246, 248, 250, 252, 254, 256, 258, 260, 262, 264, 266, 268, 270, 272, 274, 276, 278, 280, 282, 284, 286, 288, 290, 292, 294, 296, 298, 300, 302, 304, 306, 308, 310, 312, 314, 316, 318, 320, 322, 324, 326, 328, 330, 332, 334, 336, 338, 340, 342, 344, 346, 348, 350, 352, 354, 356, 358, 360, 362, 364, 366, 368, 370, 372, 374, 376, 378, 380, 382, 384, 386, 388, 390, 392, 394, 396, 398, 400, 402, 404, 406, 408, 410, 412, 414, 416, 418, 420, 422, 424, 426, 428, 430, 432, 434, 436, 438, 440, 442, 444, 446, 448, 450, 452, 454, 456, 458, 460, 462, 464, 466, 468, 470, 472, 474, 476, 478, 480, 482, 484, 486, 488, 490, 492, 494, 496, 498, 500, 502, 504, 506, 508, 510, 512, 514, 516, 518, 520, 522, 524, 526, 528, 530, 532, 534, 536, 538, 540, 542, 544, 546, 548, 550, 552, 554, 556, 558, 560, 562, 564, 566, 568, 570, 572, 574, 576, 578, 580, 582, 584, 586, 588, 590, 592, 594, 596, 598, 600, 602, 604, 606, 608, 610, 612, 614, 616, 618, 620, 622, 624, 626, 628, 630, 632, 634, 636, 638, 640, 642, 644, 646, 648, 650, 652, 654, 656, 658, 660, 662, 664, 666, 668, 670, 672, 674, 676, 678, 680, 682, 684, 686, 688, 690, 692, 694, 696, 698, 700, 702, 704, 706, 708, 710, 712, 714, 716, 718, 720, 722, 724, 726, 728, 730, 732, 734, 736, 738, 740, 742, 744, 746, 748, 750, 752, 754, 756, 758, 760, 762, 764, 766, 768, 770, 772, 774, 776, 778, 780, 782, 784, 786, 788, 790, 792, 794, 796, 798, 800, 802, 804, 806, 808, 810, 812, 814, 816, 818, 820, 822, 824, 826, 828, 830, 832, 834, 836, 838, 840, 842, 844, 846, 848, 850, 852, 854, 856, 858, 860, 862, 864, 866, 868, 870, 872, 874, 876, 878, 880, 882, 884, 886, 888, 890, 892, 894, 896, 898, 900, 902, 904, 906, 908, 910, 912, 914, 916, 918, 920, 922, 924, 926, 928, 930, 932, 934, 936, 938, 940, 942, 944, 946, 948, 950, 952, 954, 956, 958, 960, 962, 964, 966, 968, 970, 972, 974, 976, 978, 980, 982, 984, 986, 988, 990, 992, 994, 996, 998, 1000, 1002, 1004, 1006, 1008, 1010, 1012, 1014, 1016, 1018, 1020, 1022, 1024, 1026, 1028, 1030, 1032, 1034, 1036, 1038, 1040, 1042, 1044, 1046, 1048, 1050, 1052, 1054, 1056, 1058, 1060, 1062, 1064, 1066, 1068, 1070, 1072, 1074, 1076, 1078, 1080, 1082, 1084, 1086, 1088, 1090, 1092, 1094, 1096, 1098, 1100, 1102, 1104, 1106, 1108, 1110, 1112, 1114, 1116, 1118, 1120, 1122, 1124, 1126, 1128, 1130, 1132, 1134, 1136, 1138, 1140, 1142, 1144, 1146, 1148, 1150, 1152, 1154, 1156, 1158, 1160, 1162, 1164, 1166, 1168, 1170, 1172, 1174, 1176, 1178, 1180, 1182, 1184, 1186, 1188, 1190, 1192, 1194, 1196, 1198, 1200, 1202, 1204, 1206, 1208, 1210, 1212, 1214, 1216, 1218, 1220, 1222, 1224, 1226, 1228, 1230, 1232, 1234, 1236, 1238, 1240, 1242, 1244, 1246, 1248, 1250, 1252, 1254, 1256, 1258, 1260, 1262, 1264, 1266, 1268, 1270, 1272, 1274, 1276, 1278, 1280, 1282, 1284, 1286, 1288, 1290, 1292, 1294, 1296, 1298, 1300, 1302, 1304, 1306, 1308, 1310, 1312, 1314, 1316, 1318, 1320, 1322, 1324, 1326, 1328, 1330, 1332, 1334, 1336, 1338, 1340, 1342, 1344, 1346, 1348, 1350, 1352, 1354, 1356, 1358, 1360, 1362, 1364, 1366, 1368, 1370, 1372, 1374, 1376, 1378, 1380, 1382, 1384, 1386, 1388, 1390, 1392, 1394, 1396, 1398, 1400, 1402, 1404, 1406, 1408, 1410, 1412, 1414, 1416, 1418, 1420, 1422, 1424, 1426, 1428, 1430, 1432, 1434, 1436, 1438, 1440, 1442, 1444, 1446, 1448, 1450, 1452, 1454, 1456, 1458, 1460, 1462, 1464, 1466, 1468, 1470, 1472, 1474, 1476, 1478, 1480, 1482, 1484, 1486, 1488, 1490, 1492, 1494, 1496, 1498, 1500, 1502, 1504, 1506, 1508, 1510, 1512, 1514, 1516, 1518, 1520, 1522, 1524, 1526, 1528, 1530, 1532, 1534, 1536, 1538, 1540, 1542, 1544, 1546, 1548, 1550, 1552, 1554, 1556, 1558, 1560, 1562, 1564, 1566, 1568, 1570, 1572, 1574, 1576, 1578, 1580,

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Output

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Private Test case

Input 1

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2	[1,1,1,1,1,1,1]
3	5

Output

1	1
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8733, 8735, 8737, 8739, 8741, 8743, 8745, 8747, 8749, 8751, 8753, 8755, 8757, 8759, 8761, 8763, 8765, 8767, 8769, 8771, 8773, 8775, 8777, 8779, 8781, 8783, 8785, 8787, 8789, 8791, 8793, 8795, 8797, 8799, 8801, 8803, 8805, 8807, 8809, 8811, 8813, 8815, 8817, 8819, 8821, 8823, 8825, 8827, 8829, 8831, 8833, 8835, 8837, 8839, 8841, 8843, 8845, 8847, 8849, 8851, 8853, 8855, 8857, 8859, 8861, 8863, 8865, 8867, 8869, 8871, 8873, 8875, 8877, 8879, 8881, 8883, 8885, 8887, 8889, 8891, 8893, 8895, 8897, 8899, 8901, 8903, 8905, 8907, 8909, 8911, 8913, 8915, 8917, 8919, 8921, 8923, 8925, 8927, 8929, 8931, 8933, 8935, 8937, 8939, 8941, 8943, 8945, 8947, 8949, 8951, 8953, 8955, 8957, 8959, 8961, 8963, 8965, 8967, 8969, 8971, 8973, 8975, 8977, 8979, 8981, 8983, 8985, 8987, 8989, 8991, 8993, 8995, 8997, 8999, 9001, 9003, 9005, 9007, 9009, 9011, 9013, 9015, 9017, 9019, 9021, 9023, 9025, 9027, 9029, 9031, 9033, 9035, 9037, 9039, 9041, 9043, 9045, 9047, 9049, 9051, 9053, 9055, 9057, 9059, 9061, 9063, 9065, 9067, 9069, 9071, 9073, 9075, 9077, 9079, 9081, 9083, 9085, 9087, 9089, 9091, 9093, 9095, 9097, 9099, 9101, 9103, 9105, 9107, 9109, 9111, 9113, 9115, 9117, 9119, 9121, 9123, 9125, 9127, 9129, 9131, 9133, 9135, 9137, 9139, 9141, 9143, 9145, 9147, 9149, 9151, 9153, 9155, 9157, 9159, 9161, 9163, 9165, 9167, 9169, 9171, 9173, 9175, 9177, 9179, 9181, 9183, 9185, 9187, 9189, 9191, 9193, 9195, 9197, 9199, 9201, 9203, 9205, 9207, 9209, 9211, 9213, 9215, 9217, 9219, 9221, 9223, 9225, 9227, 9229, 9231, 9233, 9235, 9237, 9239, 9241, 9243, 9245, 9247, 9249, 9251, 9253, 9255, 9257, 9259, 9261, 9263, 9265, 9267, 9269, 9271, 9273, 9275, 9277, 9279, 9281, 9283, 9285, 9287, 9289, 9291, 9293, 9295, 9297, 9299, 9301, 9303, 9305, 9307, 9309, 9311, 9313, 9315, 9317, 9319, 9321, 9323, 9325, 9327, 9329, 9331, 9333, 9335, 9337, 9339, 9341, 9343, 9345, 9347, 9349, 9351, 9353, 9355, 9357, 9359, 9361, 9363, 9365, 9367, 9369, 9371, 9373, 9375, 9377, 9379, 9381, 9383, 9385, 9387, 9389, 9391, 9393, 9395, 9397, 9399, 9401, 9403, 9405, 9407, 9409, 9411, 9413, 9415, 9417, 9419, 9421, 9423, 9425, 9427, 9429, 9431, 9433, 9435, 9437, 9439, 9441, 9443, 9445, 9447, 9449, 9451, 9453, 9455, 9457, 9459, 9461, 9463, 9465, 9467, 9469, 9471, 9473, 9475, 9477, 9479, 9481, 9483, 9485, 9487, 9489, 9491, 9493, 9495, 9497, 9499, 9501, 9503, 9505, 9507, 9509, 9511, 9513, 9515, 9517, 9519, 9521, 9523, 9525, 9527, 9529, 9531, 9533, 9535, 9537, 9539, 9541, 9543, 9545, 9547, 9549, 9551, 9553, 9555, 9557, 9559, 9561, 9563, 9565, 9567, 9569, 9571, 9573, 9575, 9577, 9579, 9581, 9583, 9585, 9587, 9589, 9591, 9593, 9595, 9597, 9599, 9601, 9603, 9605, 9607, 9609, 9611, 9613, 9615, 9617, 9619, 9621, 9623, 9625, 9627, 9629, 9631, 9633, 9635, 9637, 9639, 9641, 9643, 9645, 9647, 9649, 9651, 9653, 9655, 9657, 9659, 9661, 9663, 9665, 9667, 9669, 9671, 9673, 9675, 9677, 9679, 9681, 9683, 9685, 9687, 9689, 9691, 9693, 9695, 9697, 9699, 9701, 9703, 9705, 9707, 9709, 9711, 9713, 9715, 9717, 9719, 9721, 9723, 9725, 9727, 9729, 9731, 9733, 9735, 9737, 9739, 9741, 9743, 9745, 9747, 9749, 9751, 9753, 9755, 9757, 9759, 9761, 9763, 9765, 9767, 9769, 9771, 9773, 9775, 9777, 9779, 9781, 9783, 9785, 9787, 9789, 9791, 9793, 9795, 9797, 9799, 9801, 9803, 9805, 9807, 9809, 9811, 9813, 9815, 9817, 9819, 9821, 9823, 9825, 9827, 9829, 9831, 9833, 9835, 9837, 9839, 9841, 9843, 9845, 9847, 9849, 9851, 9853, 9855, 9857, 9859, 9861, 9863, 9865, 9867, 9869, 9871, 9873, 9875, 9877, 9879, 9881, 9883, 9885, 9887, 9889, 9891, 9893, 9895, 9897, 9899, 9901, 9903, 9905, 9907, 9909, 9911, 9913, 9915, 9917, 9919, 9921, 9923, 9925, 9927, 9929, 9931, 9933, 9935, 9937, 9939, 9941, 9943, 9945, 9947, 9949, 9951, 9953, 9955, 9957, 9959, 9961, 9963, 9965, 9967, 9969, 9971, 9973, 9975, 9977, 9979, 9981, 9983, 9985, 9987, 9989, 9991, 9993, 9995, 9997, 9999]

Output

Input 3

```
1 [45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81,
  83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115,
  117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, 143, 145,
  147, 149, 151, 153, 155, 157, 159, 161, 163, 165, 167, 169, 171, 173, 175,
  177, 179, 181, 183, 185, 187, 189, 191, 193, 195, 197, 199]
2 [16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52,
  54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90,
  92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114]
3 10
```

Output

```
1 34
```

Problem 3

Write a function **pickingNumbers(a)** that accept a list `a` and return the length of the longest set of element where the absolute difference between any two elements is less than or equal to 1.

Sample input

```
1 [4 6 5 3 3 1]
```

Output

```
1 3
```

There are [4 3 3] element meeting the certain criterion.

Solution

Solution Code

```
1 def pickingNumbers(a):
2     a.sort()
3     count=1
4     pos=0
5     maxx=0
6     for i in range(1,len(a)):
7         if(abs(a[i]-a[pos])<=1):
8             count=count+1
9         else:
10            if(count>maxx):
11                maxx=count
12                count=1
13                pos=i
14    if(maxx>count):
15        return maxx
16    else:
```

```
17 |         return count
```

Suffix code(Visible)

```
1 | a=[int(item) for item in input().split(" ")]
2 | print(pickingNumbers(a))
```

Public Test case

Input 1

```
1 | 4 6 5 3 3 1
```

Output

```
1 | 3
```

Input 2

```
1 | 9 6 13 16 5 18 4 10 3 19 4 5 8 1 13 10 20 17 15 10 6 10 13 20 18 17 7 10 6 5
   | 16 18 13 20 19 7 16 13 20 17 4 17 8 19 12 7 17 1 18 3 16 4 5 3 15 17 6 17 14
   | 11 11 7 11 6 15 15 12 6 17 19 8 6 13 9 10 19 14 18 7 9 11 16 11 20 4 20 10 7
   | 8 4 2 12 11 8 12 13 19 8 8 5
```

Output

```
1 | 13
```

Input 3

```
1 | 14 18 17 10 9 20 4 13 19 19 8 15 15 17 6 5 15 12 18 2 18 7 20 8 2 8 11 2 16 2
   | 12 9 3 6 9 9 13 7 4 6 19 7 2 4 3 4 14 3 4 9 17 9 4 20 10 16 12 1 16 4 15 15 9
   | 13 6 3 8 4 7 14 16 18 20 11 20 14 20 12 15 4 5 10 10 20 11 18 5 20 13 4 18 1
   | 14 3 20 19 14 2 5 13
```

Output

```
1 | 15
```

Private Test case

Input 1

```
1 | 4 97 5 97 97 4 97 4 97 97 97 97 4 4 5 5 97 5 97 99 4 97 5 97 97 97 5 5 97 4 5
   | 97 97 5 97 4 97 5 4 4 97 5 5 5 4 97 97 4 97 5 4 4 97 97 97 5 5 97 4 97 97 5 4
   | 97 97 4 97 97 97 5 4 4 97 4 4 97 5 97 97 97 97 4 97 5 97 5 4 97 4 5 97 97 5
   | 97 5 97 5 97 97 97
```

Output

1 | 50

Input 2

[illegible]

Output

1 | 100

Input 3

[illegible]

Output

1 | 30