

```
>> i = 20
for k = 1:i
    a = [1; 1; 1; 1; 0; 0; 0; 0;]
    b = circshift(a,-2) + 10 * randn(8, 1)
    % b = circshift(a, 3) + 10 * randn(8, 1)
    c = conv(a,b)
    stem(c)
    title('Plot of vector"c"')
    [max_val, ind] = max(c)
end
```

```
i =

    20
```

```
a =

     1
     1
     1
     1
     0
     0
     0
     0
```

```
b =

    -3.4043
    -7.4847
    -2.4037
     6.0293
   -15.1625
    -0.6835
     8.8239
   -13.2073
```

```
c =

    -3.4043
   -10.8890
   -13.2927
    -7.2634
   -19.0216
   -12.2204
    -0.9928
   -20.2294
```

```
-5.0668  
-4.3833  
-13.2073  
0  
0  
0  
0
```

```
max_val =
```

```
0
```

```
ind =
```

```
12
```

```
a =
```

```
1  
1  
1  
1  
0  
0  
0  
0  
0
```

```
b =
```

```
7.6937  
7.8324  
-8.8214  
-15.0451  
4.3314  
8.0826  
6.7894  
8.6285
```

```
c =
```

```
7.6937  
15.5260  
6.7047  
-8.3404  
-11.7027
```

```
-11.4525  
 4.1582  
27.8318  
23.5004  
15.4179  
 8.6285  
    0  
    0  
    0  
    0
```

```
max_val =  
  
27.8318
```

```
ind =  
  
8
```

```
a =  
  
1  
1  
1  
1  
1  
0  
0  
0  
0
```

```
b =  
  
-10.8213  
 6.8385  
-5.8001  
-5.6137  
-15.5590  
11.0021  
 2.7506  
11.0361
```

```
c =  
  
-10.8213  
-3.9828
```

```
-9.7829
-15.3966
-20.1343
-15.9706
-7.4200
 9.2298
24.7888
13.7867
11.0361
    0
    0
    0
    0
```

```
max_val =

    24.7888
```

```
ind =

     9
```

```
a =

     1
     1
     1
     1
     0
     0
     0
     0
```

```
b =

    16.1101
   -10.3724
     6.4302
    -0.1276
     9.1426
    11.0769
     9.2047
    -7.1761
```

```
c =
```

```
16.1101
 5.7377
12.1679
12.0403
 5.0728
26.5221
29.2967
22.2481
13.1055
 2.0286
-7.1761
    0
    0
    0
    0
```

```
max_val =
```

```
29.2967
```

```
ind =
```

```
7
```

```
a =
```

```
1
1
1
1
0
0
0
0
```

```
b =
```

```
-0.2649
 3.6414
31.5853
12.2662
23.2064
 4.1450
 3.1183
 7.1317
```

c =

```
-0.2649  
 3.3766  
34.9619  
47.2280  
70.6992  
71.2028  
42.7358  
37.6013  
14.3950  
10.2500  
 7.1317  
      0  
      0  
      0  
      0
```

max_val =

```
71.2028
```

ind =

```
6
```

a =

```
1  
1  
1  
1  
0  
0  
0  
0  
0
```

b =

```
-4.2778  
13.4160  
-1.5763  
-13.7360  
 8.7084
```

```
-15.6853  
-17.4425  
 3.8841
```

```
c =
```

```
-4.2778  
 9.1382  
 7.5619  
-6.1741  
 6.8121  
-22.2893  
-38.1555  
-20.5354  
-29.2438  
-13.5584  
 3.8841  
 0  
 0  
 0  
 0
```

```
max_val =
```

```
 9.1382
```

```
ind =
```

```
 2
```

```
a =
```

```
 1  
 1  
 1  
 1  
 1  
 0  
 0  
 0  
 0
```

```
b =
```

```
-8.5091  
-8.1073
```

```
-1.6195  
-4.8890  
-2.2278  
2.7207  
-10.6853  
-11.2423
```

```
c =
```

```
-8.5091  
-16.6164  
-18.2359  
-23.1249  
-16.8437  
-6.0157  
-15.0815  
-21.4348  
-19.2070  
-21.9277  
-11.2423  
0  
0  
0  
0
```

```
max_val =
```

```
0
```

```
ind =
```

```
12
```

```
a =
```

```
1  
1  
1  
1  
0  
0  
0  
0
```

```
b =
```



```
-19.9948  
-2.9024  
6.6428  
-7.0226  
5.0133  
5.4031  
10.9075  
10.8938
```

```
c =
```

```
-19.9948  
-22.8972  
-16.2544  
-23.2770  
1.7310  
10.0366  
14.3013  
32.2177  
27.2044  
21.8013  
10.8938  
0  
0  
0  
0
```

```
max_val =
```

```
32.2177
```

```
ind =
```

```
8
```

```
a =
```

```
1  
1  
1  
1  
0  
0  
0  
0
```

b =

```
-5.8884  
-7.5684  
 0.4839  
-6.6485  
14.5274  
13.7985  
 1.9514  
-3.2713
```

c =

```
-5.8884  
-13.4568  
-12.9729  
-19.6214  
 0.7944  
22.1612  
23.6287  
27.0060  
12.4786  
-1.3199  
-3.2713  
 0  
 0  
 0  
 0
```

max_val =

```
27.0060
```

ind =

```
8
```

a =

```
1  
1  
1  
1  
0
```

```
0
0
0
```

```
b =
```

```
6.1081
-5.5627
-1.2502
-5.3047
1.0559
11.2835
8.4248
12.4360
```

```
c =
```

```
6.1081
0.5453
-0.7048
-6.0095
-11.0617
5.7845
15.4595
33.2002
32.1443
20.8608
12.4360
0
0
0
0
```

```
max_val =
```

```
33.2002
```

```
ind =
```

```
8
```

```
a =
```

```
1
1
```

```
1
1
0
0
0
0
```

```
b =
```

```
-8.1471
 2.7980
-9.8335
 3.8483
 3.2570
12.9631
11.9923
 7.5322
```

```
c =
```

```
-8.1471
-5.3491
-15.1826
-11.3343
 0.0698
10.2349
32.0607
35.7446
32.4876
19.5245
 7.5322
 0
 0
 0
 0
```

```
max_val =
```

```
35.7446
```

```
ind =
```

```
8
```

```
a =
```

```
1
1
1
1
0
0
0
0
```

```
b =
```

```
-4.0507
-3.7599
-20.5156
-4.4830
-15.5120
 9.2983
10.0194
 2.3829
```

```
c =
```

```
-4.0507
-7.8107
-28.3263
-32.8093
-44.2706
-31.2124
-0.6774
 6.1886
21.7005
12.4023
 2.3829
 0
 0
 0
 0
```

```
max_val =
```

```
21.7005
```

```
ind =
```

```
9
```

a =

1
1
1
1
0
0
0
0

b =

-2.7841
2.4306
16.0504
13.4912
-4.4844
1.6841
-10.2050
5.0073

c =

-2.7841
-0.3534
15.6970
29.1881
27.4878
26.7412
0.4859
-7.9980
-3.5135
-5.1977
5.0073
0
0
0
0

max_val =

29.1881

```
ind =
```

```
4
```

```
a =
```

```
1
```

```
1
```

```
1
```

```
1
```

```
0
```

```
0
```

```
0
```

```
0
```

```
b =
```

```
8.3906
```

```
10.0004
```

```
-15.3122
```

```
5.0462
```

```
-8.6421
```

```
-3.7655
```

```
8.8801
```

```
3.9821
```

```
c =
```

```
8.3906
```

```
18.3911
```

```
3.0789
```

```
8.1251
```

```
-8.9077
```

```
-22.6737
```

```
1.5186
```

```
0.4545
```

```
9.0966
```

```
12.8622
```

```
3.9821
```

```
0
```

```
0
```

```
0
```

```
0
```

```
max_val =
```

```
18.3911
```

```
ind =
```

```
2
```

```
a =
```

```
1  
1  
1  
1  
0  
0  
0  
0
```

```
b =
```

```
-0.6374  
7.0673  
16.3450  
-6.2349  
-13.5010  
-11.6224  
-8.4428  
-5.7121
```

```
c =
```

```
-0.6374  
6.4299  
22.7749  
16.5400  
3.6764  
-15.0134  
-39.8011  
-39.2783  
-25.7773  
-14.1549  
-5.7121  
0  
0  
0  
0
```



```
max_val =
```

```
22.7749
```

```
ind =
```

```
3
```

```
a =
```

```
1
```

```
1
```

```
1
```

```
1
```

```
0
```

```
0
```

```
0
```

```
0
```

```
b =
```

```
6.7668
```

```
-19.8577
```

```
2.3596
```

```
-7.7842
```

```
10.9956
```

```
-8.5556
```

```
1.0756
```

```
-8.3759
```

```
c =
```

```
6.7668
```

```
-13.0909
```

```
-10.7313
```

```
-18.5155
```

```
-14.2867
```

```
-2.9846
```

```
-4.2687
```

```
-4.8603
```

```
-15.8559
```

```
-7.3003
```

```
-8.3759
```

```
0
```

```
0
```

```
0
0
```

```
max_val =
6.7668
```

```
ind =
1
```

```
a =
1
1
1
1
0
0
0
0
```

```
b =
-5.8156
-1.6014
-2.2880
-5.2481
11.2832
5.5014
19.5515
-1.7730
```

```
c =
-5.8156
-7.4170
-9.7049
-14.9531
2.1457
9.2485
31.0879
34.5631
23.2799
17.7785
```

```
-1.7730
      0
      0
      0
      0
```

```
max_val =

    34.5631
```

```
ind =

      8
```

```
a =

      1
      1
      1
      1
      0
      0
      0
      0
```

```
b =

    11.6663
   -19.9924
     6.3848
     3.7147
    -3.7418
     6.9535
     9.7763
    11.3361
```

```
c =

    11.6663
    -8.3261
    -1.9412
     1.7734
   -13.6347
    13.3112
    16.7026
```

```
24.3240
28.0658
21.1123
11.3361
    0
    0
    0
    0
```

```
max_val =

    28.0658
```

```
ind =

     9
```

```
a =

     1
     1
     1
     1
     0
     0
     0
     0
     0
```

```
b =

     5.1979
     7.0107
    -6.7402
   -10.9518
    -2.6762
     1.8655
    10.5094
    -6.9052
```

```
c =

     5.1979
    12.2086
     5.4684
    -5.4834
```

```
-13.3574  
-18.5026  
-1.2530  
2.7936  
5.4698  
3.6043  
-6.9052  
0  
0  
0  
0
```

```
max_val =  
  
12.2086
```

```
ind =  
  
2
```

```
a =  
  
1  
1  
1  
1  
0  
0  
0  
0
```

```
b =  
  
-3.8948  
30.7447  
-6.2259  
19.2030  
9.6115  
-5.5780  
-0.0656  
-1.1516
```

```
c =  
  
-3.8948
```

```
26.8500
20.6241
39.8271
53.3334
17.0106
23.1709
 2.8163
-6.7952
-1.2172
-1.1516
     0
     0
     0
     0
```

```
max_val =
```

```
53.3334
```

```
ind =
```

```
5
```

```
>> i = 20
```

```
for k = 1:i
```

```
    a = [1; 1; 1; 1; 0; 0; 0; 0;]
```

```
    % b = circshift(a,-2) + 10 * randn(8, 1)
```

```
    b = circshift(a, 3) + 10 * randn(8, 1)
```

```
    c = conv(a,b)
```

```
    stem(c)
```

```
    title('Plot of vector"c"')
```

```
    [max_val, ind] = max(c)
```

```
end
```

```
i =
```

```
20
```

```
a =
```

```
1
1
1
1
0
0
0
```

0

b =

4.7349
13.6564
-16.3780
21.2373
8.7779
-4.4890
-0.2601
2.9958

c =

4.7349
18.3913
2.0133
23.2506
27.2936
9.1481
25.2660
7.0246
-1.7533
2.7357
2.9958
0
0
0
0

max_val =

27.2936

ind =

5

a =

1
1
1
1

```
0
0
0
0
```

```
b =
```

```
2.9617
12.0078
10.9017
-2.5870
-0.2993
8.3374
2.2033
11.3633
```

```
c =
```

```
2.9617
14.9695
25.8713
23.2842
20.0232
16.3528
7.6544
21.6047
21.9040
13.5666
11.3633
0
0
0
0
```

```
max_val =
```

```
25.8713
```

```
ind =
```

```
3
```

```
a =
```

```
1
```



```
1
1
1
0
0
0
0
```

```
b =
```

```
-6.8677
 4.7168
 2.8834
14.9185
-12.4550
 1.0075
 1.5349
-23.4191
```

```
c =
```

```
-6.8677
-2.1509
 0.7325
15.6511
10.0638
 6.3544
 5.0060
-33.3316
-20.8766
-21.8841
-23.4191
 0
 0
 0
 0
```

```
max_val =
```

```
15.6511
```

```
ind =
```

```
4
```

a =

1
1
1
1
0
0
0
0

b =

12.4810
28.0923
-2.3218
3.8703
-3.6460
4.8432
-2.7983
-1.0178

c =

12.4810
40.5733
38.2514
42.1217
25.9947
2.7456
2.2692
-2.6189
1.0271
-3.8161
-1.0178
0
0
0
0

max_val =

42.1217

ind =

4

a =

1
1
1
1
0
0
0
0

b =

16.1815
-8.4723
-5.7588
0.2409
-0.3247
15.3931
21.3126
-9.7820

c =

16.1815
7.7092
1.9504
2.1912
-14.3150
9.5504
36.6219
26.5990
26.9237
11.5306
-9.7820
0
0
0
0

max_val =

36.6219

```
ind =
```

```
7
```

```
a =
```

```
1
```

```
1
```

```
1
```

```
1
```

```
0
```

```
0
```

```
0
```

```
0
```

```
b =
```

```
-6.4102
```

```
5.2048
```

```
-3.8070
```

```
20.9285
```

```
17.3587
```

```
6.5902
```

```
6.6364
```

```
-3.3840
```

```
c =
```

```
-6.4102
```

```
-1.2055
```

```
-5.0125
```

```
15.9160
```

```
39.6850
```

```
41.0704
```

```
51.5138
```

```
27.2013
```

```
9.8426
```

```
3.2524
```

```
-3.3840
```

```
0
```

```
0
```

```
0
```

```
0
```

```
max_val =
```

```
51.5138
```

```
ind =
```

```
7
```

```
a =
```

```
1
```

```
1
```

```
1
```

```
1
```

```
0
```

```
0
```

```
0
```

```
0
```

```
b =
```

```
7.6365
```

```
11.2744
```

```
1.4157
```

```
20.2813
```

```
7.7064
```

```
-0.1011
```

```
4.7096
```

```
10.9659
```

```
c =
```

```
7.6365
```

```
18.9109
```

```
20.3266
```

```
40.6079
```

```
40.6779
```

```
29.3023
```

```
32.5962
```

```
23.2808
```

```
15.5745
```

```
15.6756
```

```
10.9659
```

```
0
```

```
0
```

```
0
```

```
0
```

```
max_val =
```

```
40.6779
```

```
ind =
```

```
5
```

```
a =
```

```
1
```

```
1
```

```
1
```

```
1
```

```
0
```

```
0
```

```
0
```

```
0
```

```
b =
```

```
-3.9816
```

```
-0.8546
```

```
23.7329
```

```
-3.7392
```

```
10.4634
```

```
9.1816
```

```
16.8897
```

```
5.2601
```

```
c =
```

```
-3.9816
```

```
-4.8363
```

```
18.8966
```

```
15.1574
```

```
29.6024
```

```
39.6387
```

```
32.7955
```

```
41.7949
```

```
31.3314
```

```
22.1498
```

```
5.2601
```

```
0
```

```
0
0
0
```

```
max_val =
41.7949
```

```
ind =
8
```

```
a =
1
1
1
1
0
0
0
0
```

```
b =
-24.6520
-8.5253
5.1174
3.5777
20.6245
15.0631
5.9683
0.8283
```

```
c =
-24.6520
-33.1773
-28.0599
-24.4822
20.7943
44.3827
45.2337
42.4843
21.8598
```

```
6.7966
0.8283
0
0
0
0
```

```
max_val =
45.2337
```

```
ind =
7
```

```
a =
1
1
1
1
0
0
0
0
```

```
b =
-15.4848
18.6316
1.3403
-14.4600
5.3328
2.0295
-4.7035
4.9306
```

```
c =
-15.4848
3.1468
4.4871
-9.9729
10.8447
-5.7574
```



```
-11.8011  
 7.5895  
 2.2567  
 0.2272  
 4.9306  
 0  
 0  
 0  
 0
```

```
max_val =  
  
10.8447
```

```
ind =  
  
5
```

```
a =  
  
1  
1  
1  
1  
0  
0  
0  
0
```

```
b =  
  
-7.0751  
-13.4803  
-17.5430  
-2.6381  
-5.2709  
 5.4015  
-14.0264  
-2.0824
```

```
c =  
  
-7.0751  
-20.5554  
-38.0984
```

```
-40.7365  
-38.9323  
-20.0505  
-16.5339  
-15.9782  
-10.7073  
-16.1088  
-2.0824  
    0  
    0  
    0  
    0
```

```
max_val =
```

```
    0
```

```
ind =
```

```
   12
```

```
a =
```

```
    1  
    1  
    1  
    1  
    0  
    0  
    0  
    0
```

```
b =
```

```
-15.0513  
 18.0974  
 -1.1697  
 13.2621  
  5.9494  
 10.0859  
-10.5422  
 12.5756
```

```
c =
```

```
-15.0513
 3.0462
 1.8764
15.1385
36.1392
28.1277
18.7553
18.0687
12.1193
 2.0334
12.5756
    0
    0
    0
    0
```

```
max_val =

    36.1392
```

```
ind =

     5
```

```
a =

     1
     1
     1
     1
     0
     0
     0
     0
```

```
b =

    14.5253
   -20.7681
    -1.7649
    -5.5208
     2.5653
    -7.5023
     3.7905
     5.9709
```

c =

```
14.5253  
-6.2428  
-8.0077  
-13.5285  
-25.4885  
-12.2226  
-6.6673  
4.8245  
2.2591  
9.7614  
5.9709  
0  
0  
0  
0
```

max_val =

```
14.5253
```

ind =

```
1
```

a =

```
1  
1  
1  
1  
0  
0  
0  
0
```

b =

```
2.4472  
-1.1835  
-12.8941  
1.5756  
-4.2093  
-11.7903
```

```
0.4377
-2.0968
```

```
c =
```

```
2.4472
1.2637
-11.6304
-10.0547
-16.7112
-27.3180
-13.9862
-17.6587
-13.4493
-1.6591
-2.0968
0
0
0
0
```

```
max_val =
```

```
2.4472
```

```
ind =
```

```
1
```

```
a =
```

```
1
1
1
1
1
0
0
0
0
```

```
b =
```

```
1.9210
9.9233
5.7624
```

```
14.0578
-6.2931
-7.6457
0.0508
13.8321
```

```
c =
```

```
1.9210
11.8443
17.6068
31.6646
23.4505
5.8815
0.1698
-0.0559
6.2372
13.8829
13.8321
0
0
0
0
```

```
max_val =
```

```
31.6646
```

```
ind =
```

```
4
```

```
a =
```

```
1
1
1
1
0
0
0
0
```

```
b =
```

```
13.0368
-1.2581
-5.9687
-14.2065
 7.7184
 1.2284
-10.7779
-3.3458
```

```
c =
```

```
13.0368
11.7787
 5.8100
-8.3965
-13.7149
-11.2283
-16.0375
-5.1768
-12.8952
-14.1237
-3.3458
    0
    0
    0
    0
```

```
max_val =
```

```
13.0368
```

```
ind =
```

```
1
```

```
a =
```

```
1
1
1
1
0
0
0
0
```

b =

```
-18.2946  
  4.2999  
 -1.7399  
 17.3124  
-12.5943  
 10.7051  
  2.4364  
  0.8260
```

c =

```
-18.2946  
-13.9947  
-15.7346  
  1.5778  
  7.2781  
 13.6833  
 17.8596  
  1.3732  
 13.9675  
  3.2624  
  0.8260  
      0  
      0  
      0  
      0
```

max_val =

```
17.8596
```

ind =

```
7
```

a =

```
1  
1  
1  
1  
0  
0
```



```
0
0
```

```
b =
```

```
7.1666
11.9348
-10.7106
14.1890
-11.1000
-9.7411
-5.7256
7.3646
```

```
c =
```

```
7.1666
19.1015
8.3909
22.5799
4.3132
-17.3628
-12.3778
-19.2022
-8.1021
1.6390
7.3646
0
0
0
0
```

```
max_val =
```

```
22.5799
```

```
ind =
```

```
4
```

```
a =
```

```
1
1
1
```

```
1
0
0
0
0
```

```
b =
```

```
-10.6996
 3.3472
 4.1188
 2.5412
 6.5457
-10.7285
11.0759
 1.1352
```

```
c =
```

```
-10.6996
 -7.3525
 -3.2336
 -0.6924
16.5529
 2.4773
 9.4343
 8.0283
 1.4826
12.2111
 1.1352
    0
    0
    0
    0
```

```
max_val =
```

```
16.5529
```

```
ind =
```

```
5
```

```
a =
```

```
1
1
1
1
0
0
0
0
```

```
b =
```

```
7.3005
-9.8351
0.5203
9.7760
11.1414
0.1565
-17.5353
-10.9682
```

```
c =
```

```
7.3005
-2.5346
-2.0143
7.7617
11.6026
21.5942
3.5386
-17.2056
-28.3470
-28.5035
-10.9682
0
0
0
0
```

```
max_val =
```

```
21.5942
```

```
ind =
```

```
6
```

>>