```
>> demo_Polynomial_Dictionary_Learning
Starting to train the dictionary
solving the quadratic problem with YALMIP...

 num. of constraints = 85
 dim. of socp   var  = 86,   num. of socp blk  =  1
 dim. of linear var  = 800
 dim. of free   var  = 15
 *** convert ublk to linear blk
******************************************************************************↙
********
   SDPT3: homogeneous self-dual path-following algorithms
******************************************************************************↙
********
 version  predcorr  gam  expon
   HKM      1      0.000   1
it pstep dstep pinfeas dinfeas  gap     mean(obj)    cputime    kap    tau    theta
------------------------------------------------------------------------------↙
--------
 0|0.000|0.000|2.7e+01|1.3e+02|1.1e+07| 1.107923e+04| 0:0:00|1.1e+07|1.0e+00|1.↙
0e+00| chol 1  1
 1|0.014|0.014|2.7e+01|1.3e+02|1.1e+07| 1.111669e+04| 0:0:00|1.1e+07|1.0e+00|9.9e-↙
01| chol 1  1
 2|0.131|0.131|2.4e+01|1.2e+02|1.0e+07| 1.118685e+04| 0:0:00|9.9e+06|1.0e+00|8.6e-↙
01| chol 1  1
 3|0.630|0.630|8.9e+00|4.3e+01|3.8e+06| 1.121511e+04| 0:0:00|3.7e+06|1.0e+00|3.2e-↙
01| chol 1  1
 4|0.147|0.147|7.8e+00|3.8e+01|3.4e+06| 1.149684e+04| 0:0:00|3.2e+06|9.8e-01|2.8e-↙
01| chol 1  1
 5|0.746|0.746|2.1e+00|1.0e+01|9.1e+05| 1.145801e+04| 0:0:00|8.0e+05|9.8e-01|7.4e-↙
02| chol 1  1
 6|0.387|0.387|1.5e+00|7.2e+00|7.3e+05| 1.247151e+04| 0:0:00|5.3e+05|9.4e-01|5.1e-↙
02| chol 1  1
 7|0.639|0.639|6.3e-01|3.1e+00|3.3e+05| 1.246242e+04| 0:0:00|2.0e+05|9.3e-01|2.1e-↙
02| chol 1  1
 8|0.693|0.693|3.8e-01|1.8e+00|2.5e+05| 1.468962e+04| 0:0:00|8.3e+04|8.3e-01|1.1e-↙
02| chol 1  1
 9|0.769|0.769|1.3e-01|6.1e-01|8.0e+04| 1.053959e+04| 0:0:00|7.3e+03|9.5e-01|4.3e-↙
03| chol 1  1
10|0.753|0.753|5.1e-02|2.5e-01|2.9e+04| 6.064108e+03| 0:0:00|3.8e+02|1.1e+00|2.1e-↙
03| chol 1  1
11|0.792|0.792|1.7e-02|8.2e-02|8.4e+03| 2.503910e+03| 0:0:00|1.7e+01|1.4e+00|8.7e-↙
04| chol 1  1
12|0.982|0.982|3.3e-03|1.6e-02|1.6e+03| 4.903252e+02| 0:0:00|9.9e+00|1.7e+00|2.0e-↙
04| chol 1  1
13|0.820|0.820|2.4e-03|1.2e-02|1.2e+03| 3.606558e+02| 0:0:00|4.0e+00|1.7e+00|1.5e-↙
04| chol 1  1
14|1.000|1.000|1.4e-03|6.1e-03|6.0e+02| 1.582381e+02| 0:0:01|2.1e+00|1.7e+00|7.9e-↙
05| chol 1  1
15|1.000|1.000|6.8e-04|3.4e-03|3.2e+02| 4.752559e+01| 0:0:01|1.1e+00|1.8e+00|4.2e-↙
05| chol 1  1
16|1.000|1.000|3.5e-04|1.6e-03|1.5e+02|-3.196917e+00| 0:0:01|6.0e-01|1.8e+00|2.1e-↙
05| chol 1  1
17|1.000|1.000|1.6e-04|8.2e-04|7.4e+01|-3.108874e+01| 0:0:01|2.9e-01|1.8e+00|1.1e-↙
```

```
05| chol 1  1
18|1.000|1.000|8.8e-05|3.5e-04|3.1e+01|-4.252394e+01| 0:0:01|1.4e-01|1.8e+00|4.4e-↙
06| chol 1  1
19|1.000|1.000|3.7e-05|1.5e-04|1.3e+01|-4.841096e+01| 0:0:01|6.0e-02|1.8e+00|1.8e-↙
06| chol 1  1
20|1.000|1.000|2.5e-05|6.7e-05|4.6e+00|-5.028979e+01| 0:0:01|2.5e-02|1.8e+00|6.9e-↙
07| chol 1  1
21|1.000|1.000|6.1e-06|4.2e-05|2.1e+00|-5.104074e+01| 0:0:01|8.4e-03|1.9e+00|3.3e-↙
07| chol 1  1
22|1.000|1.000|9.3e-06|2.9e-05|6.3e-01|-5.138777e+01| 0:0:01|4.2e-03|2.0e+00|1.1e-↙
07| chol 1  1
23|1.000|1.000|2.7e-06|2.5e-05|2.3e-01|-5.150115e+01| 0:0:01|1.3e-03|2.0e+00|4.0e-↙
08| chol 1  1
24|1.000|1.000|3.4e-07|1.2e-05|6.6e-02|-5.154209e+01| 0:0:01|5.0e-04|2.0e+00|1.1e-↙
08| chol 1  1
25|1.000|1.000|2.8e-07|4.8e-06|2.6e-02|-5.155403e+01| 0:0:01|1.4e-04|2.0e+00|4.5e-↙
09| chol 1  1
26|1.000|1.000|5.0e-07|1.9e-06|8.7e-03|-5.155870e+01| 0:0:01|5.6e-05|2.0e+00|1.5e-↙
09| chol 1  1
27|0.801|0.801|6.3e-07|1.0e-06|5.6e-03|-5.155985e+01| 0:0:01|2.6e-05|2.0e+00|9.6e-↙
10| chol 1  1
28|0.443|0.443|1.6e-06|7.3e-07|4.7e-03|-5.156022e+01| 0:0:01|2.0e-05|2.0e+00|7.9e-↙
10| chol 1  1
29|0.509|0.509|2.5e-06|4.8e-07|3.5e-03|-5.156073e+01| 0:0:01|1.5e-05|2.0e+00|5.5e-↙
10| chol 1  1
30|0.360|0.360|4.6e-06|4.4e-07|3.2e-03|-5.156095e+01| 0:0:01|1.2e-05|2.0e+00|4.5e-↙
10| chol 1  1
31|0.397|0.397|9.2e-06|3.8e-07|2.9e-03|-5.156120e+01| 0:0:01|1.0e-05|2.0e+00|3.4e-↙
10| chol 1  1
  stop: primal infeas has deteriorated too much, 2.5e-05  0, 0, 1
32|0.619|0.619|9.2e-06|3.8e-07|2.9e-03|-5.156120e+01| 0:0:01|1.0e-05|2.0e+00|3.4e-↙
10|
------------------------------------------------------------------
 number of iterations   = 32
 primal objective value = -5.15603070e+01
 dual   objective value = -5.15620966e+01
 gap := trace(XZ)       = 2.88e-03
 relative gap           = 5.47e-05
 actual relative gap    = 1.72e-05
 rel. primal infeas     = 9.18e-06
 rel. dual   infeas     = 3.77e-07
 norm(X), norm(y), norm(Z) = 2.1e+02, 5.2e+01, 2.0e+01
 norm(A), norm(b), norm(C) = 7.4e+03, 3.9e+01, 7.6e+01
 Total CPU time (secs)  = 0.71
 CPU time per iteration = 0.02
 termination code       = -7
 DIMACS errors: 9.2e-06  0.0e+00  3.8e-07  0.0e+00  1.7e-05  2.8e-05
------------------------------------------------------------------

ans =

   51.5620
```

```
 num. of constraints = 85
 dim. of socp   var  = 86,   num. of socp blk  =  1
 dim. of linear var  = 800
 dim. of free   var  = 15
 *** convert ublk to linear blk
******************************************************************************↙
********
   SDPT3: homogeneous self-dual path-following algorithms
******************************************************************************↙
********
 version  predcorr  gam  expon
   HKM      1      0.000   1
it pstep dstep pinfeas dinfeas  gap     mean(obj)    cputime    kap   tau    theta
------------------------------------------------------------------------------↙
--------
 0|0.000|0.000|2.4e+00|1.7e+03|1.4e+10| 1.365739e+07| 0:0:00|1.4e+10|1.0e+00|1.↙
0e+00| chol 1  1
 1|0.000|0.000|2.4e+00|1.7e+03|1.4e+10| 1.365902e+07| 0:0:00|1.4e+10|1.0e+00|1.↙
0e+00| chol 1  2
 2|0.000|0.000|2.4e+00|1.7e+03|1.4e+10| 1.366183e+07| 0:0:00|1.4e+10|1.0e+00|1.↙
0e+00| chol 1  2
 3|0.008|0.008|2.4e+00|1.7e+03|1.4e+10| 1.367805e+07| 0:0:00|1.4e+10|1.0e+00|9.9e-↙
01| chol 1  2
 4|0.008|0.008|2.4e+00|1.7e+03|1.4e+10| 1.372076e+07| 0:0:00|1.4e+10|1.0e+00|9.9e-↙
01| chol 2  2
 5|0.140|0.140|2.1e+00|1.5e+03|1.2e+10| 1.382382e+07| 0:0:00|1.2e+10|9.9e-01|8.5e-↙
01| chol 2  3
 6|0.331|0.331|1.4e+00|1.0e+03|8.4e+09| 1.401766e+07| 0:0:00|8.0e+09|9.9e-01|5.8e-↙
01| chol 2  2
 7|0.891|0.891|1.6e-01|1.1e+02|9.6e+08| 1.385753e+07| 0:0:00|8.5e+08|9.9e-01|6.6e-↙
02| chol 2  3
 8|0.224|0.224|1.3e-01|9.7e+01|8.5e+08| 1.454309e+07| 0:0:00|6.8e+08|9.6e-01|5.4e-↙
02| chol 3  3
 9|0.666|0.666|5.0e-02|3.6e+01|3.2e+08| 1.395908e+07| 0:0:00|2.2e+08|9.8e-01|2.0e-↙
02| chol 3  3
10|0.483|0.483|3.4e-02|2.4e+01|2.5e+08| 1.476434e+07| 0:0:00|1.2e+08|9.3e-01|1.3e-↙
02| chol 3  4
11|0.685|0.685|1.4e-02|1.0e+01|1.0e+08| 1.223514e+07| 0:0:00|3.0e+07|1.0e+00|5.8e-↙
03| chol 3  4
12|0.653|0.653|7.3e-03|5.3e+00|5.4e+07| 9.230484e+06| 0:0:00|7.9e+06|1.1e+00|3.3e-↙
03| chol 5  5
13|0.663|0.663|4.4e-03|2.9e+00|2.9e+07| 6.627617e+06| 0:0:00|2.1e+06|1.2e+00|1.9e-↙
03| chol 5  5
14|0.979|0.979|2.1e-02|1.4e+00|1.7e+07| 4.601304e+06| 0:0:00|1.4e+05|1.1e+00|9.4e-↙
04| chol 5  8
15|0.776|0.776|1.4e-02|7.0e-01|7.2e+06| 2.259655e+06| 0:0:00|2.5e+04|1.3e+00|5.3e-↙
04| chol 6  5
16|1.000|1.000|6.9e-03|4.4e-01|4.3e+06| 1.442524e+06| 0:0:00|8.8e+03|1.4e+00|3.6e-↙
04| chol 7  6
17|1.000|1.000|1.2e-02|2.5e-01|2.1e+06| 7.020572e+05| 0:0:00|6.3e+03|1.5e+00|2.1e-↙
04| chol 5  5
18|1.000|1.000|1.4e-02|1.6e-01|1.1e+06| 3.530411e+05| 0:0:00|3.2e+03|1.5e+00|1.4e-↙
04| chol 5  6
19|0.928|0.928|2.1e-02|1.1e-01|5.6e+05| 1.666625e+05| 0:0:00|1.9e+03|1.5e+00|9.7e-↙
```

```
05| chol^ 3  6
20|1.000|1.000|5.2e-02|8.6e-02|1.8e+05| 2.415936e+04| 0:0:00|9.6e+02|1.5e+00|7.4e-↙
05| chol 6  6
21|0.270|0.270|7.2e-02|1.0e-01|1.8e+05| 3.177474e+04| 0:0:00|8.0e+02|1.5e+00|8.6e-↙
05| chol 6  9
22|0.168|0.168|1.0e-01|1.2e-01|1.9e+05| 4.994374e+04| 0:0:00|7.4e+02|1.4e+00|1.0e-↙
04| chol 6  6
23|0.120|0.120|1.3e-01|1.5e-01|2.3e+05| 8.608370e+04| 0:0:00|7.2e+02|1.3e+00|1.2e-↙
04| chol 6  7
24|0.094|0.094|1.5e-01|1.9e-01|3.0e+05| 1.521372e+05| 0:0:00|7.4e+02|1.2e+00|1.4e-↙
04| chol 5  5
25|0.090|0.090|1.5e-01|2.3e-01|3.8e+05| 2.395420e+05| 0:0:00|7.4e+02|1.2e+00|1.6e-↙
04| chol 6  6
26|0.070|0.070|1.1e-01|2.4e-01|4.4e+05| 3.291550e+05| 0:0:00|7.2e+02|1.2e+00|1.7e-↙
04| chol 7  8
27|0.148|0.148|8.0e-02|3.0e-01|6.2e+05| 5.337841e+05| 0:0:00|7.5e+02|1.1e+00|2.0e-↙
04| chol 5  6
28|0.219|0.219|7.2e-02|4.0e-01|9.2e+05| 8.597221e+05| 0:0:00|8.2e+02|1.0e+00|2.3e-↙
04| chol 7  6
29|0.233|0.233|7.8e-02|4.8e-01|1.2e+06| 1.161793e+06| 0:0:01|9.2e+02|9.5e-01|2.6e-↙
04| chol 6  7
30|0.215|0.215|8.3e-02|5.4e-01|1.4e+06| 1.413521e+06| 0:0:01|1.0e+03|9.0e-01|2.8e-↙
04| chol 5  6
31|0.446|0.446|1.0e-01|7.0e-01|1.6e+06| 2.012509e+06| 0:0:01|1.3e+03|7.8e-01|3.2e-↙
04| chol 7  5
32|0.519|0.519|1.9e-01|7.8e-01|1.8e+06| 2.379457e+06| 0:0:01|1.4e+03|7.5e-01|3.3e-↙
04| chol 5  6
33|0.886|0.886|2.3e-01|9.2e-01|9.7e+05| 2.984712e+06| 0:0:01|1.6e+03|6.7e-01|3.5e-↙
04| chol 5  8
34|0.948|0.948|3.0e-01|9.6e-01|5.5e+05| 3.178955e+06| 0:0:01|7.9e+02|6.5e-01|3.6e-↙
04| chol 7  7
35|0.736|0.736|2.9e-01|9.7e-01|3.6e+05| 3.271778e+06| 0:0:01|5.0e+02|6.4e-01|3.6e-↙
04| chol 6  6
36|0.969|0.969|3.6e-01|9.9e-01|8.3e+04| 3.397250e+06| 0:0:01|2.6e+02|6.4e-01|3.6e-↙
04| chol 6  8
37|0.967|0.967|1.0e+00|1.0e+00|4.3e+04| 3.472450e+06| 0:0:01|6.6e+01|6.4e-01|3.7e-↙
04| chol 7  7
38|0.406|0.406|1.3e+00|1.0e+00|4.0e+04| 3.496537e+06| 0:0:01|5.1e+01|6.4e-01|3.7e-↙
04| chol10  9
39|0.566|0.566|2.1e+00|1.0e+00|2.8e+04| 3.550856e+06| 0:0:01|3.8e+01|6.3e-01|3.7e-↙
04| chol 8  9
40|0.392|0.392|2.8e+00|1.0e+00|2.6e+04| 3.583653e+06| 0:0:01|3.1e+01|6.3e-01|3.7e-↙
04| chol 7  9
41|0.184|0.184|2.8e+00|1.0e+00|2.6e+04| 3.607326e+06| 0:0:01|2.8e+01|6.3e-01|3.7e-↙
04| chol 7 10
42|0.372|0.372|3.5e+00|1.0e+00|2.4e+04| 3.658286e+06| 0:0:01|2.4e+01|6.3e-01|3.7e-↙
04| chol11  9
43|0.817|0.817|4.4e+00|1.0e+00|2.0e+04| 3.773930e+06| 0:0:01|1.8e+01|6.3e-01|3.8e-↙
04| chol 9  7
44|0.775|0.775|3.8e+00|1.0e+00|1.3e+04| 3.829549e+06| 0:0:01|1.5e+01|6.3e-01|3.8e-↙
04| chol 7  7
45|0.946|0.946|4.3e+00|1.0e+00|2.8e+03| 3.880543e+06| 0:0:01|9.5e+00|6.3e-01|3.8e-↙
04| chol 8  7
46|0.676|0.676|6.6e+00|1.1e+00|2.6e+03| 3.897422e+06| 0:0:01|4.4e+00|6.3e-01|3.8e-↙
```

```
04| chol 8  9
47|0.238|0.238|7.1e+00|1.1e+00|2.5e+03| 3.907130e+06| 0:0:01|3.8e+00|6.3e-01|3.8e-↙
04|
  Stop: relative gap < infeasibility
-----------------------------------------------------------------
 number of iterations   = 47
 primal objective value =  4.12395140e+06
 dual   objective value = -9.89339231e+04
 gap := trace(XZ)       = 1.63e+06
 relative gap           = 7.71e-01
 actual relative gap    = 1.00e+00
 rel. primal infeas     = 1.04e-01
 rel. dual   infeas     = 7.00e-01
 norm(X), norm(y), norm(Z) = 4.8e+09, 1.0e+05, 1.4e+05
 norm(A), norm(b), norm(C) = 2.0e+05, 2.6e+05, 7.6e+01
 Total CPU time (secs)  = 0.85
 CPU time per iteration = 0.02
 termination code       = -1
 DIMACS errors: 1.0e-01  0.0e+00  7.0e-01  0.0e+00  1.0e+00  3.9e-01
-----------------------------------------------------------------

ans =

   1.6713e+06

Iteration   2   Total error is: 2.8531

 num. of constraints = 85
 dim. of socp   var  = 86,   num. of socp blk  =  1
 dim. of linear var  = 800
 dim. of free   var  = 15
 *** convert ublk to linear blk
*****************************************************************************↙
********
   SDPT3: homogeneous self-dual path-following algorithms
*****************************************************************************↙
********
 version  predcorr  gam  expon
   HKM      1      0.000   1
it pstep dstep pinfeas dinfeas  gap     mean(obj)    cputime    kap   tau    theta
-----------------------------------------------------------------------------↙
--------
 0|0.000|0.000|2.5e+00|1.3e+02|3.3e+07| 3.196557e+04| 0:0:00|3.3e+07|1.0e+00|1.↙
0e+00| chol 1  1
 1|0.001|0.001|2.5e+00|1.3e+02|3.3e+07| 3.201447e+04| 0:0:00|3.3e+07|1.0e+00|1.↙
0e+00| chol 1  1
 2|0.062|0.062|2.3e+00|1.3e+02|3.1e+07| 3.206843e+04| 0:0:00|3.1e+07|1.0e+00|9.4e-↙
01| chol 1  1
 3|0.148|0.148|2.0e+00|1.1e+02|2.7e+07| 3.223484e+04| 0:0:00|2.6e+07|1.0e+00|8.0e-↙
01| chol 1  1
 4|0.747|0.747|5.1e-01|2.8e+01|6.8e+06| 3.207007e+04| 0:0:00|6.6e+06|1.0e+00|2.1e-↙
01| chol 1  1
 5|0.628|0.628|1.9e-01|1.0e+01|2.6e+06| 3.147537e+04| 0:0:00|2.4e+06|1.0e+00|7.8e-↙
02| chol 1  1
```

```
 6|0.083|0.083|1.9e-01|1.0e+01|2.7e+06| 3.323415e+04| 0:0:00|2.3e+06|9.8e-01|7.4e-↙
02| chol 1  1
 7|0.429|0.429|1.2e-01|6.4e+00|1.7e+06| 3.416375e+04| 0:0:00|1.4e+06|9.6e-01|4.6e-↙
02| chol 1  1
 8|0.586|0.586|6.7e-02|3.7e+00|1.2e+06| 3.841014e+04| 0:0:00|6.6e+05|8.9e-01|2.4e-↙
02| chol 1  1
 9|0.846|0.846|1.3e-02|6.9e-01|2.4e+05| 3.065909e+04| 0:0:00|3.8e+04|9.8e-01|5.0e-↙
03| chol 1  1
10|0.427|0.427|9.8e-03|5.3e-01|1.9e+05| 2.860527e+04| 0:0:00|2.2e+04|9.8e-01|3.9e-↙
03| chol 1  1
11|0.675|0.675|3.7e-03|2.0e-01|5.6e+04| 1.312507e+04| 0:0:00|9.3e+02|1.3e+00|1.9e-↙
03| chol 1  1
12|0.813|0.813|1.0e-03|5.6e-02|1.4e+04| 4.691662e+03| 0:0:00|3.8e+01|1.5e+00|6.4e-↙
04| chol 1  1
13|1.000|1.000|3.8e-04|2.0e-02|5.8e+03| 2.115455e+03| 0:0:00|2.1e+01|1.6e+00|2.4e-↙
04| chol 2  2
14|0.792|0.792|2.1e-04|7.2e-03|2.0e+03| 7.059078e+02| 0:0:00|1.1e+01|1.7e+00|9.4e-↙
05| chol 1  1
15|0.992|0.992|9.9e-05|5.0e-03|1.4e+03| 4.558186e+02| 0:0:00|3.8e+00|1.8e+00|6.5e-↙
05| chol 1  1
16|1.000|1.000|6.5e-05|2.5e-03|6.7e+02| 1.987365e+02| 0:0:00|2.6e+00|1.8e+00|3.3e-↙
05| chol 1  1
17|1.000|1.000|2.5e-05|1.2e-03|3.2e+02| 6.331839e+01| 0:0:00|1.3e+00|1.8e+00|1.6e-↙
05| chol 1  1
18|1.000|1.000|1.3e-05|5.2e-04|1.4e+02|-1.991030e-03| 0:0:00|6.2e-01|1.8e+00|6.8e-↙
06| chol 1  1
19|1.000|1.000|4.8e-06|2.4e-04|6.2e+01|-2.609649e+01| 0:0:00|2.6e-01|1.8e+00|3.2e-↙
06| chol 1  1
20|1.000|1.000|2.2e-06|1.0e-04|2.4e+01|-3.691360e+01| 0:0:00|1.2e-01|1.9e+00|1.3e-↙
06| chol 1  1
21|1.000|1.000|9.1e-07|5.0e-05|9.2e+00|-4.165333e+01| 0:0:00|4.6e-02|1.9e+00|5.1e-↙
07| chol 1  1
22|1.000|1.000|6.7e-07|2.9e-05|2.3e+00|-4.346798e+01| 0:0:00|1.8e-02|1.9e+00|1.3e-↙
07| chol 1  1
23|0.978|0.978|3.2e-07|2.4e-05|7.7e-01|-4.394953e+01| 0:0:00|5.0e-03|1.9e+00|4.5e-↙
08| chol 1  1
24|1.000|1.000|9.9e-07|2.2e-05|3.6e-01|-4.409575e+01| 0:0:00|1.6e-03|1.9e+00|2.1e-↙
08| chol 1  1
25|0.340|0.340|1.9e-06|1.8e-05|3.1e-01|-4.413881e+01| 0:0:00|1.3e-03|1.9e+00|1.7e-↙
08| chol 1  1
26|0.340|0.340|3.2e-06|1.4e-05|2.7e-01|-4.418356e+01| 0:0:00|1.1e-03|1.9e+00|1.5e-↙
08| chol 1  1
27|0.286|0.286|4.7e-06|1.1e-05|2.6e-01|-4.421816e+01| 0:0:00|9.7e-04|1.9e+00|1.3e-↙
08| chol 1  1
28|0.218|0.218|6.5e-06|8.8e-06|2.5e-01|-4.424491e+01| 0:0:00|8.8e-04|1.9e+00|1.2e-↙
08| chol 1  1
29|0.179|0.179|8.5e-06|7.4e-06|2.5e-01|-4.426956e+01| 0:0:00|8.3e-04|1.9e+00|1.0e-↙
08| chol 1  1
30|0.391|0.391|1.1e-05|4.8e-06|2.3e-01|-4.431633e+01| 0:0:00|7.2e-04|1.9e+00|8.6e-↙
09| chol 1  1
31|0.249|0.249|1.4e-05|4.1e-06|2.5e-01|-4.433883e+01| 0:0:00|6.7e-04|1.8e+00|7.6e-↙
09| chol 1  1
32|0.156|0.156|1.6e-05|4.1e-06|2.7e-01|-4.435156e+01| 0:0:00|6.5e-04|1.8e+00|7.2e-↙
09| chol 1  1
```

```
33|0.236|0.236|1.8e-05|3.8e-06|2.9e-01|-4.437511e+01| 0:0:00|6.4e-04|1.8e+00|6.5e-↙
09| chol 1  1
34|0.357|0.357|1.8e-05|3.2e-06|2.9e-01|-4.439928e+01| 0:0:00|6.2e-04|1.7e+00|6.4e-↙
09| chol 1  1
35|0.282|0.282|1.9e-05|2.9e-06|3.1e-01|-4.441010e+01| 0:0:00|6.1e-04|1.7e+00|6.6e-↙
09| chol 1  1
36|0.570|0.570|2.3e-05|1.9e-06|2.5e-01|-4.444624e+01| 0:0:00|6.1e-04|1.6e+00|5.8e-↙
09| chol 1  1
37|0.458|0.458|3.0e-05|1.5e-06|2.4e-01|-4.445574e+01| 0:0:00|5.6e-04|1.6e+00|5.9e-↙
09| chol 2  1
38|0.430|0.430|4.1e-05|1.3e-06|2.4e-01|-4.446711e+01| 0:0:00|5.3e-04|1.5e+00|5.7e-↙
09| chol 2  2
39|0.388|0.388|5.2e-05|1.3e-06|2.5e-01|-4.447099e+01| 0:0:00|4.9e-04|1.4e+00|6.1e-↙
09| chol 2  2
40|0.293|0.293|6.2e-05|1.3e-06|2.6e-01|-4.447359e+01| 0:0:00|4.7e-04|1.4e+00|6.3e-↙
09| chol 2  2
41|0.171|0.171|6.7e-05|1.3e-06|2.8e-01|-4.447419e+01| 0:0:00|4.7e-04|1.4e+00|6.3e-↙
09| chol 2  2
42|0.350|0.350|7.8e-05|1.2e-06|2.9e-01|-4.448170e+01| 0:0:00|4.7e-04|1.4e+00|5.8e-↙
09| chol 2  2
43|0.284|0.284|1.9e-04|9.4e-07|3.1e-01|-4.451167e+01| 0:0:01|4.8e-04|1.3e+00|4.2e-↙
09| chol 2  3
44|0.116|0.116|7.4e-04|8.5e-07|4.4e-01|-4.454200e+01| 0:0:01|5.1e-04|1.2e+00|3.0e-↙
09| chol 3  4
45|0.085|0.085|1.9e-03|8.5e-07|6.8e-01|-4.456468e+01| 0:0:01|5.4e-04|1.2e+00|2.8e-↙
09| chol 3  5
46|0.097|0.097|4.2e-03|9.0e-07|1.2e+00|-4.460096e+01| 0:0:01|6.1e-04|1.1e+00|2.9e-↙
09| chol 4  4
47|0.091|0.091|8.3e-03|9.8e-07|2.0e+00|-4.465787e+01| 0:0:01|7.2e-04|1.0e+00|3.3e-↙
09| chol 5  3
48|0.114|0.114|1.7e-02|1.2e-06|3.5e+00|-4.480430e+01| 0:0:01|9.4e-04|9.2e-01|4.3e-↙
09| chol 4  7
49|0.043|0.043|2.1e-02|1.3e-06|4.3e+00|-4.482726e+01| 0:0:01|1.1e-03|9.0e-01|5.3e-↙
09| chol 4  5
50|0.079|0.079|3.7e-02|1.7e-06|6.6e+00|-4.507931e+01| 0:0:01|1.4e-03|8.5e-01|7.8e-↙
09|
  Stop: maximum number of iterations reached
-----------------------------------------------------------------
 number of iterations   = 50
 primal objective value = -4.49303237e+01
 dual   objective value = -4.52283061e+01
 gap := trace(XZ)       = 6.62e+00
 relative gap           = 1.44e-01
 actual relative gap    = 3.27e-03
 rel. primal infeas     = 3.66e-02
 rel. dual   infeas     = 1.74e-06
 norm(X), norm(y), norm(Z) = 7.6e+06, 5.8e+01, 2.2e+01
 norm(A), norm(b), norm(C) = 7.7e+03, 1.4e+03, 7.6e+01
 Total CPU time (secs)  = 0.61
 CPU time per iteration = 0.01
 termination code       = -6
 DIMACS errors: 3.7e-02  0.0e+00  1.7e-06  0.0e+00  3.3e-03  7.3e-02
-----------------------------------------------------------------
```

```
ans =

   45.1598

Iteration   3   Total error is: 0.027195

 num. of constraints = 85
 dim. of socp   var  = 86,   num. of socp blk  =  1
 dim. of linear var  = 800
 dim. of free   var  = 15
 *** convert ublk to linear blk
******************************************************************************
********
   SDPT3: homogeneous self-dual path-following algorithms
******************************************************************************
********
 version  predcorr  gam  expon
   HKM      1      0.000   1
it pstep dstep pinfeas dinfeas  gap     mean(obj)    cputime    kap   tau    theta
------------------------------------------------------------------------------
--------
 0|0.000|0.000|2.7e+00|1.4e+02|3.2e+08| 3.206256e+05| 0:0:00|3.2e+08|1.0e+00|1.
0e+00| chol 1  1
 1|0.000|0.000|2.7e+00|1.4e+02|3.2e+08| 3.206875e+05| 0:0:00|3.2e+08|1.0e+00|1.
0e+00| chol 1  1
 2|0.001|0.001|2.7e+00|1.4e+02|3.2e+08| 3.208432e+05| 0:0:00|3.2e+08|1.0e+00|1.
0e+00| chol 1  1
 3|0.034|0.034|2.6e+00|1.4e+02|3.1e+08| 3.213767e+05| 0:0:00|3.1e+08|1.0e+00|9.7e-
01| chol 1  1
 4|0.024|0.024|2.6e+00|1.4e+02|3.1e+08| 3.231815e+05| 0:0:00|3.1e+08|1.0e+00|9.5e-
01| chol 1  1
 5|0.350|0.350|1.7e+00|9.0e+01|2.1e+08| 3.252970e+05| 0:0:00|2.0e+08|9.9e-01|6.2e-
01| chol 1  1
 6|0.480|0.480|9.1e-01|4.9e+01|1.1e+08| 3.305411e+05| 0:0:00|1.1e+08|9.8e-01|3.3e-
01| chol 1  1
 7|0.676|0.676|3.1e-01|1.6e+01|3.9e+07| 3.319702e+05| 0:0:00|3.5e+07|9.8e-01|1.1e-
01| chol 1  1
 8|0.482|0.482|1.8e-01|9.7e+00|2.5e+07| 3.498664e+05| 0:0:00|1.9e+07|9.5e-01|6.4e-
02| chol 1  1
 9|0.806|0.806|3.9e-02|2.1e+00|5.6e+06| 3.266826e+05| 0:0:00|3.3e+06|9.7e-01|1.4e-
02| chol 2  2
10|0.526|0.526|2.8e-02|1.5e+00|4.8e+06| 3.607642e+05| 0:0:00|1.8e+06|9.0e-01|9.4e-
03| chol 2  2
11|0.615|0.615|1.6e-02|8.7e-01|2.9e+06| 3.233452e+05| 0:0:00|6.4e+05|9.3e-01|5.6e-
03| chol 2  2
12|0.783|0.783|6.7e-03|3.6e-01|1.1e+06| 2.070484e+05| 0:0:00|3.2e+04|1.1e+00|2.7e-
03| chol 2  2
13|0.785|0.785|2.7e-03|1.4e-01|3.9e+05| 1.099776e+05| 0:0:00|1.7e+03|1.3e+00|1.2e-
03| chol 3  3
14|1.000|1.000|3.8e-03|4.2e-02|1.2e+05| 4.257223e+04| 0:0:00|3.0e+02|1.5e+00|4.3e-
04| chol 3  3
15|0.770|0.770|5.6e-03|2.2e-02|5.9e+04| 2.134397e+04| 0:0:00|2.0e+02|1.6e+00|2.4e-
04| chol 3  4
16|1.000|1.000|3.7e-03|1.1e-02|2.8e+04| 1.038492e+04| 0:0:00|9.3e+01|1.7e+00|1.3e-
```

```
04| chol 3  3
17|0.966|0.966|3.2e-03|3.7e-03|8.8e+03| 3.193449e+03| 0:0:00|4.9e+01|1.8e+00|4.5e-↙
05| chol 3  3
18|1.000|1.000|2.7e-03|2.6e-03|6.2e+03| 1.988520e+03| 0:0:00|1.6e+01|1.8e+00|3.1e-↙
05| chol 2  2
19|1.000|1.000|1.7e-03|1.5e-03|3.5e+03| 1.117432e+03| 0:0:00|1.2e+01|1.8e+00|1.7e-↙
05| chol 2  2
20|1.000|1.000|7.5e-04|8.3e-04|1.9e+03| 5.533756e+02| 0:0:00|6.8e+00|1.8e+00|9.2e-↙
06| chol 2  2
21|1.000|1.000|4.7e-04|4.4e-04|9.1e+02| 2.711631e+02| 0:0:00|3.7e+00|1.8e+00|4.5e-↙
06| chol 2  2
22|1.000|1.000|1.1e-04|2.2e-04|4.3e+02| 1.047506e+02| 0:0:00|1.8e+00|1.9e+00|2.1e-↙
06| chol 2  1
23|1.000|1.000|6.7e-05|8.5e-05|1.6e+02| 2.595669e+01| 0:0:00|8.5e-01|1.9e+00|8.6e-↙
07| chol 1  1
24|1.000|1.000|1.2e-05|4.1e-05|6.1e+01|-1.042055e+01| 0:0:00|3.2e-01|1.9e+00|3.3e-↙
07| chol 1  1
25|1.000|1.000|1.0e-05|2.4e-05|2.4e+01|-2.197867e+01| 0:0:00|1.2e-01|1.9e+00|1.4e-↙
07| chol 1  1
26|1.000|1.000|4.5e-06|1.8e-05|6.0e+00|-2.842686e+01| 0:0:00|4.8e-02|2.0e+00|3.6e-↙
08| chol 1  1
27|1.000|1.000|1.5e-06|1.6e-05|2.2e+00|-2.965133e+01| 0:0:00|1.3e-02|2.0e+00|1.3e-↙
08| chol 1  1
28|1.000|1.000|8.0e-07|1.4e-05|6.6e-01|-3.019031e+01| 0:0:00|4.6e-03|2.0e+00|4.0e-↙
09| chol 1  1
29|1.000|1.000|1.2e-06|1.3e-05|2.6e-01|-3.033735e+01| 0:0:00|1.4e-03|2.0e+00|1.6e-↙
09| chol 1  1
30|0.211|0.211|1.3e-06|1.1e-05|2.4e-01|-3.036280e+01| 0:0:00|1.3e-03|2.0e+00|1.4e-↙
09| chol 1  1
31|0.079|0.079|1.4e-06|1.0e-05|2.5e-01|-3.037800e+01| 0:0:00|1.2e-03|2.0e+00|1.3e-↙
09| chol 1  1
32|0.205|0.205|2.1e-06|8.4e-06|2.5e-01|-3.040751e+01| 0:0:00|1.1e-03|2.0e+00|1.3e-↙
09| chol 1  1
33|0.122|0.122|2.4e-06|7.5e-06|2.6e-01|-3.042993e+01| 0:0:00|1.0e-03|2.0e+00|1.1e-↙
09| chol 1  1
34|0.096|0.096|2.6e-06|6.9e-06|2.7e-01|-3.045243e+01| 0:0:00|9.6e-04|2.0e+00|9.7e-↙
10| chol 1  1
35|0.062|0.062|2.7e-06|6.6e-06|2.8e-01|-3.046923e+01| 0:0:00|9.4e-04|2.0e+00|8.3e-↙
10| chol 1  1
36|0.030|0.030|2.6e-06|6.5e-06|2.9e-01|-3.047241e+01| 0:0:00|9.3e-04|2.0e+00|8.6e-↙
10| chol 1  1
37|0.162|0.162|3.0e-06|5.6e-06|3.1e-01|-3.051586e+01| 0:0:00|8.8e-04|2.0e+00|5.2e-↙
10| chol 1  1
38|0.143|0.143|3.1e-06|4.8e-06|3.2e-01|-3.057280e+01| 0:0:00|8.6e-04|2.0e+00|0.↙
0e+00| chol 1  2
39|0.160|0.160|1.2e-05|4.1e-06|3.7e-01|-3.072845e+01| 0:0:00|8.5e-04|1.9e+00|0.↙
0e+00| chol 2  2
40|0.125|0.125|3.5e-05|3.7e-06|4.9e-01|-3.093309e+01| 0:0:00|8.6e-04|1.9e+00|0.↙
0e+00| chol 2  2
41|0.196|0.196|8.5e-05|3.1e-06|6.9e-01|-3.121917e+01| 0:0:00|9.2e-04|1.8e+00|0.↙
0e+00| chol 2  2
42|0.107|0.107|1.2e-04|2.8e-06|8.7e-01|-3.142276e+01| 0:0:00|1.0e-03|1.7e+00|0.↙
0e+00| chol 2  2
43|0.475|0.475|2.4e-04|1.6e-06|1.1e+00|-3.180759e+01| 0:0:01|1.3e-03|1.6e+00|6.0e-↙
```

```
11| chol 2  2
44|0.264|0.264|2.9e-04|1.2e-06|1.2e+00|-3.201131e+01| 0:0:01|1.6e-03|1.5e+00|0.↙
0e+00| chol 2  2
45|0.548|0.548|3.7e-04|5.7e-07|1.1e+00|-3.225609e+01| 0:0:01|1.9e-03|1.5e+00|8.1e-↙
12| chol 2  2
46|0.247|0.247|3.7e-04|4.4e-07|1.1e+00|-3.229303e+01| 0:0:01|1.9e-03|1.4e+00|8.5e-↙
11| chol 2  3
47|0.075|0.075|3.4e-04|4.7e-07|1.2e+00|-3.225843e+01| 0:0:01|1.9e-03|1.4e+00|3.4e-↙
10| chol 2  2
48|0.343|0.343|2.8e-04|4.2e-07|1.5e+00|-3.224216e+01| 0:0:01|2.1e-03|1.3e+00|7.2e-↙
10| chol
  SMW too ill-conditioned, switch to LU factor, 6.0e+25.
  switch to LU factor lu  3  3
49|0.296|0.296|2.3e-04|4.3e-07|1.7e+00|-3.221231e+01| 0:0:01|2.2e-03|1.2e+00|1.0e-↙
09| lu  2  2
50|0.283|0.283|1.6e-04|5.2e-07|2.1e+00|-3.201498e+01| 0:0:01|2.4e-03|1.1e+00|1.8e-↙
09|
  Stop: maximum number of iterations reached
-----------------------------------------------------------------
 number of iterations   = 50
 primal objective value = -3.17805720e+01
 dual   objective value = -3.22493956e+01
 gap := trace(XZ)       = 2.13e+00
 relative gap           = 6.44e-02
 actual relative gap    = 7.21e-03
 rel. primal infeas     = 1.57e-04
 rel. dual   infeas     = 5.22e-07
 norm(X), norm(y), norm(Z) = 2.7e+05, 7.1e+01, 3.4e+01
 norm(A), norm(b), norm(C) = 9.7e+03, 4.9e+03, 7.6e+01
 Total CPU time (secs)  = 0.61
 CPU time per iteration = 0.01
 termination code       = -6
 DIMACS errors: 1.6e-04  0.0e+00  5.2e-07  0.0e+00  7.2e-03  3.3e-02
-----------------------------------------------------------------

ans =

   32.2176

Iteration   4   Total error is: 0.023033

 num. of constraints = 85
 dim. of socp   var  = 86,   num. of socp blk  =  1
 dim. of linear var  = 800
 dim. of free   var  = 15
 *** convert ublk to linear blk
*****************************************************************************↙
********
   SDPT3: homogeneous self-dual path-following algorithms
*****************************************************************************↙
********
 version  predcorr  gam  expon
   HKM      1      0.000   1
it pstep dstep pinfeas dinfeas  gap     mean(obj)    cputime    kap   tau    theta
```

```
-------------------------------------------------------------------------------↙
--------
 0|0.000|0.000|2.7e+00|1.5e+02|6.4e+08| 6.279789e+05| 0:0:00|6.4e+08|1.0e+00|1.↙
0e+00| chol 1  1
 1|0.000|0.000|2.7e+00|1.5e+02|6.4e+08| 6.280801e+05| 0:0:00|6.4e+08|1.0e+00|1.↙
0e+00| chol 1  1
 2|0.001|0.001|2.7e+00|1.5e+02|6.4e+08| 6.283116e+05| 0:0:00|6.3e+08|1.0e+00|1.↙
0e+00| chol 1  1
 3|0.022|0.022|2.7e+00|1.5e+02|6.2e+08| 6.292361e+05| 0:0:00|6.2e+08|1.0e+00|9.8e-↙
01| chol 1  1
 4|0.017|0.017|2.6e+00|1.4e+02|6.2e+08| 6.322107e+05| 0:0:00|6.1e+08|1.0e+00|9.6e-↙
01| chol 1  1
 5|0.256|0.256|2.0e+00|1.1e+02|4.7e+08| 6.368310e+05| 0:0:00|4.6e+08|9.9e-01|7.2e-↙
01| chol 1  1
 6|0.422|0.422|1.2e+00|6.5e+01|2.9e+08| 6.475998e+05| 0:0:00|2.7e+08|9.8e-01|4.3e-↙
01| chol 1  1
 7|0.782|0.782|2.7e-01|1.5e+01|6.6e+07| 6.450161e+05| 0:0:00|5.9e+07|9.8e-01|9.7e-↙
02| chol 1  1
 8|0.378|0.378|1.9e-01|1.0e+01|4.9e+07| 6.831176e+05| 0:0:00|3.9e+07|9.5e-01|6.5e-↙
02| chol 1  2
 9|0.774|0.774|4.7e-02|2.6e+00|1.3e+07| 6.467639e+05| 0:0:00|8.1e+06|9.7e-01|1.7e-↙
02| chol 2  2
10|0.520|0.520|3.3e-02|1.8e+00|1.1e+07| 7.048296e+05| 0:0:00|4.4e+06|9.1e-01|1.1e-↙
02| chol 2  2
11|0.636|0.636|1.7e-02|9.6e-01|5.9e+06| 6.304579e+05| 0:0:00|1.5e+06|9.4e-01|6.0e-↙
03| chol 2  2
12|0.808|0.808|7.1e-03|3.9e-01|2.3e+06| 4.249096e+05| 0:0:00|7.5e+04|1.1e+00|2.8e-↙
03| chol 2  3
13|0.784|0.784|3.0e-03|1.5e-01|8.4e+05| 2.306372e+05| 0:0:00|4.0e+03|1.3e+00|1.3e-↙
03| chol 3  4
14|0.896|0.896|6.0e-03|6.4e-02|3.6e+05| 1.175928e+05| 0:0:00|1.0e+03|1.4e+00|6.1e-↙
04| chol 3  4
15|1.000|1.000|6.4e-03|3.0e-02|1.6e+05| 5.732982e+04| 0:0:00|4.7e+02|1.5e+00|3.1e-↙
04| chol 3  3
16|1.000|1.000|4.4e-03|8.1e-03|3.7e+04| 1.315100e+04| 0:0:00|2.2e+02|1.7e+00|9.2e-↙
05| chol 3  3
17|0.756|0.756|3.0e-03|4.5e-03|2.0e+04| 6.701164e+03| 0:0:00|9.9e+01|1.8e+00|5.1e-↙
05| chol 3  3
18|0.672|0.672|2.2e-03|3.8e-03|1.8e+04| 5.552823e+03| 0:0:00|5.8e+01|1.8e+00|4.3e-↙
05| chol 2  2
19|0.916|0.916|1.8e-03|2.9e-03|1.3e+04| 4.403334e+03| 0:0:00|3.6e+01|1.8e+00|3.2e-↙
05| chol 2  2
20|0.787|0.787|1.1e-03|1.9e-03|8.5e+03| 2.596787e+03| 0:0:00|2.7e+01|1.8e+00|2.1e-↙
05| chol 2  3
21|1.000|1.000|1.1e-03|1.1e-03|4.8e+03| 1.576392e+03| 0:0:00|1.7e+01|1.8e+00|1.3e-↙
05| chol 3  2
22|1.000|1.000|6.3e-04|5.5e-04|2.2e+03| 6.655733e+02| 0:0:00|9.4e+00|1.8e+00|5.9e-↙
06| chol 2  2
23|1.000|1.000|4.8e-04|3.0e-04|1.1e+03| 3.299661e+02| 0:0:00|4.4e+00|1.9e+00|3.0e-↙
06| chol 2  2
24|0.955|0.955|2.1e-04|1.8e-04|6.1e+02| 1.566205e+02| 0:0:00|2.3e+00|1.9e+00|1.6e-↙
06| chol 2  2
25|1.000|1.000|1.7e-04|9.8e-05|3.3e+02| 8.538949e+01| 0:0:00|1.2e+00|1.9e+00|9.0e-↙
07| chol 2  2
```

```
26|1.000|1.000|5.3e-05|5.1e-05|1.3e+02| 1.226217e+01| 0:0:00|6.8e-01|1.9e+00|3.5e-↙
07| chol 2  2
27|1.000|1.000|4.4e-05|2.7e-05|6.5e+01|-5.599044e+00| 0:0:00|2.6e-01|1.9e+00|1.8e-↙
07| chol 2  1
28|1.000|1.000|1.3e-05|1.8e-05|2.3e+01|-2.087998e+01| 0:0:00|1.3e-01|1.9e+00|6.5e-↙
08| chol 1  1
29|1.000|1.000|8.6e-06|1.4e-05|7.4e+00|-2.550470e+01| 0:0:00|4.6e-02|2.0e+00|2.3e-↙
08| chol 1  1
30|1.000|1.000|2.3e-06|1.2e-05|2.0e+00|-2.747201e+01| 0:0:00|1.6e-02|2.0e+00|6.1e-↙
09| chol 1  1
31|1.000|1.000|5.1e-07|1.0e-05|7.9e-01|-2.787492e+01| 0:0:00|4.2e-03|2.0e+00|2.5e-↙
09| chol 1  1
32|0.847|0.847|1.7e-07|9.3e-06|2.7e-01|-2.807343e+01| 0:0:00|2.1e-03|2.0e+00|8.6e-↙
10| chol 1  1
33|0.918|0.918|1.4e-07|5.0e-06|8.2e-02|-2.815607e+01| 0:0:00|7.2e-04|2.0e+00|2.6e-↙
10| chol 1  1
34|0.518|0.518|2.2e-07|3.6e-06|6.2e-02|-2.816911e+01| 0:0:00|4.4e-04|2.0e+00|1.9e-↙
10| chol 1  1
35|0.092|0.092|3.4e-07|3.4e-06|6.2e-02|-2.817284e+01| 0:0:00|4.1e-04|2.0e+00|1.8e-↙
10| chol 1  1
36|0.036|0.036|5.0e-07|3.3e-06|6.3e-02|-2.817564e+01| 0:0:00|4.0e-04|2.0e+00|1.6e-↙
10|
  Stop: steps too short consecutively
-----------------------------------------------------------------
 number of iterations   = 36
 primal objective value = -2.81620356e+01
 dual   objective value = -2.81892504e+01
 gap := trace(XZ)       = 6.26e-02
 relative gap           = 2.15e-03
 actual relative gap    = 4.75e-04
 rel. primal infeas     = 5.03e-07
 rel. dual   infeas     = 3.26e-06
 norm(X), norm(y), norm(Z) = 1.0e+03, 7.5e+01, 3.9e+01
 norm(A), norm(b), norm(C) = 1.1e+04, 9.6e+03, 7.6e+01
 Total CPU time (secs)  = 0.47
 CPU time per iteration = 0.01
 termination code       = -5
 DIMACS errors: 5.0e-07  0.0e+00  3.3e-06  0.0e+00  4.7e-04  1.1e-03
-----------------------------------------------------------------

ans =

   28.1883

Iteration   5   Total error is: 0.021667

 num. of constraints = 85
 dim. of socp   var  = 86,   num. of socp blk  =  1
 dim. of linear var  = 800
 dim. of free   var  = 15
 *** convert ublk to linear blk
**********************************************************************↙
********
   SDPT3: homogeneous self-dual path-following algorithms
```

```
**********************************************************************************↙
********
 version  predcorr  gam  expon
   HKM      1      0.000   1
it pstep dstep pinfeas dinfeas  gap     mean(obj)    cputime    kap   tau    theta
-----------------------------------------------------------------------------------↙
--------
 0|0.000|0.000|2.7e+00|1.5e+02|7.4e+08| 7.268264e+05| 0:0:00|7.4e+08|1.0e+00|1.↙
0e+00| chol 1  1
 1|0.000|0.000|2.7e+00|1.5e+02|7.4e+08| 7.269392e+05| 0:0:00|7.4e+08|1.0e+00|1.↙
0e+00| chol 1  1
 2|0.000|0.000|2.7e+00|1.5e+02|7.4e+08| 7.272013e+05| 0:0:00|7.4e+08|1.0e+00|1.↙
0e+00| chol 1  1
 3|0.021|0.021|2.6e+00|1.5e+02|7.2e+08| 7.282488e+05| 0:0:00|7.2e+08|1.0e+00|9.8e-↙
01| chol 1  1
 4|0.016|0.016|2.6e+00|1.5e+02|7.2e+08| 7.316465e+05| 0:0:00|7.1e+08|1.0e+00|9.7e-↙
01| chol 1  1
 5|0.225|0.225|2.0e+00|1.2e+02|5.7e+08| 7.375003e+05| 0:0:00|5.5e+08|9.9e-01|7.5e-↙
01| chol 1  1
 6|0.404|0.404|1.2e+00|7.2e+01|3.6e+08| 7.509078e+05| 0:0:00|3.4e+08|9.8e-01|4.6e-↙
01| chol 1  1
 7|0.798|0.798|2.6e-01|1.5e+01|7.6e+07| 7.477888e+05| 0:0:00|6.8e+07|9.8e-01|9.7e-↙
02| chol 1  1
 8|0.386|0.386|1.8e-01|1.0e+01|5.6e+07| 7.906378e+05| 0:0:00|4.4e+07|9.5e-01|6.4e-↙
02| chol 2  2
 9|0.765|0.765|4.7e-02|2.7e+00|1.5e+07| 7.499977e+05| 0:0:00|9.6e+06|9.7e-01|1.7e-↙
02| chol 2  2
10|0.526|0.526|3.2e-02|1.9e+00|1.2e+07| 8.120710e+05| 0:0:00|5.1e+06|9.1e-01|1.1e-↙
02| chol 2  2
11|0.658|0.658|1.5e-02|8.9e-01|5.9e+06| 6.856434e+05| 0:0:00|1.5e+06|9.7e-01|5.6e-↙
03| chol 2  2
12|0.811|0.811|6.3e-03|3.7e-01|2.4e+06| 4.590639e+05| 0:0:00|7.7e+04|1.1e+00|2.6e-↙
03| chol 3  3
13|0.794|0.794|2.8e-03|1.4e-01|8.7e+05| 2.454619e+05| 0:0:00|4.1e+03|1.3e+00|1.2e-↙
03| chol 3  4
14|0.867|0.867|7.7e-03|6.8e-02|4.3e+05| 1.384576e+05| 0:0:00|1.3e+03|1.4e+00|6.2e-↙
04| chol 3  3
15|1.000|1.000|6.1e-03|3.3e-02|2.0e+05| 7.057624e+04| 0:0:00|5.4e+02|1.5e+00|3.3e-↙
04| chol 3  3
16|0.962|0.962|5.2e-03|6.1e-03|2.9e+04| 9.330055e+03| 0:0:00|2.8e+02|1.7e+00|6.8e-↙
05| chol 3  3
17|0.693|0.693|3.3e-03|4.7e-03|2.3e+04| 7.280191e+03| 0:0:00|1.1e+02|1.8e+00|5.3e-↙
05| chol 3  3
18|0.625|0.625|2.4e-03|4.1e-03|2.0e+04| 6.377536e+03| 0:0:00|6.9e+01|1.8e+00|4.5e-↙
05| chol 2  2
19|0.229|0.229|2.2e-03|3.9e-03|2.1e+04| 5.948778e+03| 0:0:00|6.3e+01|1.8e+00|4.3e-↙
05| chol 2  2
20|0.920|0.920|2.1e-03|3.1e-03|1.6e+04| 5.313087e+03| 0:0:00|4.2e+01|1.8e+00|3.5e-↙
05| chol 4  2
21|0.991|0.991|1.4e-03|1.6e-03|7.7e+03| 2.498029e+03| 0:0:00|3.0e+01|1.8e+00|1.8e-↙
05| chol 2  3
22|1.000|1.000|1.1e-03|9.2e-04|4.0e+03| 1.323182e+03| 0:0:00|1.5e+01|1.8e+00|1.0e-↙
05| chol 2  2
23|0.964|0.964|7.4e-04|5.5e-04|2.3e+03| 6.860877e+02| 0:0:00|8.3e+00|1.9e+00|5.8e-↙
```

```
06| chol 2  2
24|1.000|1.000|6.4e-04|3.5e-04|1.3e+03| 4.245496e+02| 0:0:00|4.6e+00|1.9e+00|3.5e-↙
06| chol 2  2
25|0.896|0.896|3.8e-04|2.1e-04|7.5e+02| 1.982391e+02| 0:0:00|2.9e+00|1.9e+00|1.9e-↙
06| chol 2  2
26|0.988|0.988|3.0e-04|1.3e-04|4.6e+02| 1.282586e+02| 0:0:00|1.6e+00|1.9e+00|1.1e-↙
06| chol 2  2
27|0.776|0.776|1.3e-04|9.8e-05|2.9e+02| 5.701873e+01| 0:0:00|1.1e+00|1.9e+00|6.8e-↙
07| chol 2  2
28|1.000|1.000|1.2e-04|5.1e-05|1.7e+02| 3.455885e+01| 0:0:00|6.0e-01|1.9e+00|4.1e-↙
07| chol 2  2
29|0.947|0.947|4.7e-05|3.3e-05|7.8e+01|-1.916080e+00| 0:0:00|3.6e-01|1.9e+00|1.8e-↙
07| chol 2  2
30|1.000|1.000|4.5e-05|1.8e-05|4.0e+01|-1.129594e+01| 0:0:00|1.5e-01|1.9e+00|9.6e-↙
08| chol 2  2
31|1.000|1.000|2.1e-05|1.4e-05|1.4e+01|-2.047019e+01| 0:0:00|7.9e-02|1.9e+00|3.4e-↙
08| chol 1  2
32|1.000|1.000|1.3e-05|1.0e-05|5.3e+00|-2.289907e+01| 0:0:00|2.8e-02|2.0e+00|1.4e-↙
08| chol 1  1
33|1.000|1.000|4.3e-06|8.8e-06|1.7e+00|-2.410940e+01| 0:0:00|1.1e-02|2.0e+00|4.5e-↙
09| chol 1  1
34|1.000|1.000|1.7e-06|7.6e-06|6.1e-01|-2.445865e+01| 0:0:00|3.7e-03|2.0e+00|1.6e-↙
09| chol 1  1
35|1.000|1.000|4.8e-07|6.7e-06|2.2e-01|-2.460147e+01| 0:0:00|1.3e-03|2.0e+00|5.8e-↙
10| chol 1  1
36|0.479|0.479|1.1e-06|5.1e-06|1.7e-01|-2.465547e+01| 0:0:00|9.1e-04|2.0e+00|4.2e-↙
10| chol 1  1
37|0.169|0.169|1.6e-06|4.6e-06|1.8e-01|-2.468996e+01| 0:0:00|8.2e-04|2.0e+00|3.4e-↙
10| chol 2  1
38|0.253|0.253|3.0e-06|3.7e-06|1.8e-01|-2.472177e+01| 0:0:00|7.1e-04|2.0e+00|3.0e-↙
10| chol 1  1
39|0.141|0.141|3.3e-06|3.3e-06|1.9e-01|-2.473930e+01| 0:0:00|6.7e-04|2.0e+00|2.7e-↙
10| chol 1  1
40|0.234|0.234|4.1e-06|2.7e-06|2.1e-01|-2.478015e+01| 0:0:01|6.1e-04|2.0e+00|1.3e-↙
10| chol 2  2
41|0.084|0.084|4.8e-06|2.5e-06|2.2e-01|-2.480012e+01| 0:0:01|6.0e-04|2.0e+00|8.1e-↙
11| chol 2  2
42|0.274|0.274|1.1e-05|1.8e-06|2.2e-01|-2.488768e+01| 0:0:01|5.7e-04|2.0e+00|0.↙
0e+00| chol 2  2
43|0.149|0.149|1.8e-05|1.6e-06|2.4e-01|-2.494997e+01| 0:0:01|5.6e-04|1.9e+00|0.↙
0e+00| chol 2  2
44|0.026|0.026|1.8e-05|1.5e-06|2.5e-01|-2.497038e+01| 0:0:01|5.6e-04|1.9e+00|0.↙
0e+00| chol 2  2
45|0.013|0.013|1.7e-05|1.5e-06|2.6e-01|-2.498656e+01| 0:0:01|5.6e-04|1.9e+00|0.↙
0e+00| chol 2  3
46|0.093|0.093|2.4e-05|1.4e-06|3.2e-01|-2.511672e+01| 0:0:01|5.8e-04|1.9e+00|0.↙
0e+00| chol 2  3
47|0.072|0.072|5.2e-05|1.4e-06|4.2e-01|-2.530111e+01| 0:0:01|6.0e-04|1.8e+00|0.↙
0e+00| chol
  SMW too ill-conditioned, switch to LU factor, 4.7e+26.
  switch to LU factor lu  3  3
48|0.033|0.033|7.9e-05|1.4e-06|5.3e-01|-2.543904e+01| 0:0:01|6.3e-04|1.8e+00|0.↙
0e+00| lu  3  3
49|0.121|0.121|2.3e-04|1.3e-06|9.9e-01|-2.602880e+01| 0:0:01|7.5e-04|1.5e+00|0.↙
```

```
0e+00| lu  4  4
50|0.206|0.206|5.8e-04|1.3e-06|2.1e+00|-2.693673e+01| 0:0:01|1.1e-03|1.3e+00|0.↙
0e+00|
  Stop: maximum number of iterations reached
-----------------------------------------------------------------
 number of iterations   = 50
 primal objective value = -2.82270473e+01
 dual   objective value = -2.56464160e+01
 gap := trace(XZ)       = 2.12e+00
 relative gap           = 7.58e-02
 actual relative gap    = -4.70e-02
 rel. primal infeas     = 5.77e-04
 rel. dual   infeas     = 1.27e-06
 norm(X), norm(y), norm(Z) = 4.6e+05, 7.5e+01, 3.9e+01
 norm(A), norm(b), norm(C) = 1.1e+04, 1.2e+04, 7.6e+01
 Total CPU time (secs)  = 0.66
 CPU time per iteration = 0.01
 termination code       = -6
 DIMACS errors: 5.8e-04  0.0e+00  1.3e-06  0.0e+00  -4.7e-02  3.9e-02
-----------------------------------------------------------------

ans =

   25.6279

Iteration   6   Total error is: 0.020626

 num. of constraints = 85
 dim. of socp   var  = 86,   num. of socp blk  =  1
 dim. of linear var  = 800
 dim. of free   var  = 15
 *** convert ublk to linear blk
**************************************************************************↙
********
   SDPT3: homogeneous self-dual path-following algorithms
**************************************************************************↙
********
 version  predcorr  gam  expon
   HKM      1      0.000   1
it pstep dstep pinfeas dinfeas  gap     mean(obj)    cputime    kap   tau    theta
-------------------------------------------------------------------------------↙
--------
 0|0.000|0.000|2.6e+00|1.6e+02|8.4e+08| 8.342560e+05| 0:0:00|8.4e+08|1.0e+00|1.↙
0e+00| chol 1  1
 1|0.000|0.000|2.6e+00|1.6e+02|8.4e+08| 8.343823e+05| 0:0:00|8.4e+08|1.0e+00|1.↙
0e+00| chol 1  1
 2|0.000|0.000|2.6e+00|1.6e+02|8.4e+08| 8.346711e+05| 0:0:00|8.4e+08|1.0e+00|1.↙
0e+00| chol 1  1
 3|0.020|0.020|2.6e+00|1.5e+02|8.3e+08| 8.358477e+05| 0:0:00|8.3e+08|1.0e+00|9.8e-↙
01| chol 1  1
 4|0.015|0.015|2.6e+00|1.5e+02|8.3e+08| 8.396432e+05| 0:0:00|8.2e+08|1.0e+00|9.7e-↙
01| chol 1  1
 5|0.211|0.211|2.1e+00|1.2e+02|6.7e+08| 8.464341e+05| 0:0:00|6.5e+08|9.9e-01|7.7e-↙
01| chol 1  1
```

```
 6|0.396|0.396|1.3e+00|7.6e+01|4.2e+08| 8.618274e+05| 0:0:00|4.0e+08|9.8e-01|4.8e-↙
01| chol 1  1
 7|0.805|0.805|2.6e-01|1.5e+01|8.8e+07| 8.580029e+05| 0:0:00|7.8e+07|9.8e-01|9.7e-↙
02| chol 1  1
 8|0.386|0.386|1.8e-01|1.1e+01|6.4e+07| 9.056541e+05| 0:0:00|5.1e+07|9.5e-01|6.4e-↙
02| chol 3  2
 9|0.756|0.756|4.8e-02|2.9e+00|1.8e+07| 8.614962e+05| 0:0:00|1.2e+07|9.7e-01|1.8e-↙
02| chol 2  2
10|0.530|0.530|3.2e-02|1.9e+00|1.4e+07| 9.277926e+05| 0:0:00|6.1e+06|9.1e-01|1.1e-↙
02| chol 2  2
11|0.663|0.663|1.5e-02|9.0e-01|6.7e+06| 7.768967e+05| 0:0:00|1.7e+06|9.7e-01|5.6e-↙
03| chol 2  2
12|0.817|0.817|6.3e-03|3.7e-01|2.7e+06| 5.257415e+05| 0:0:00|8.9e+04|1.1e+00|2.6e-↙
03| chol 3  3
13|0.796|0.796|2.8e-03|1.4e-01|1.0e+06| 2.822143e+05| 0:0:00|4.8e+03|1.3e+00|1.2e-↙
03| chol 3  5
14|0.839|0.839|8.3e-03|7.4e-02|5.3e+05| 1.672877e+05| 0:0:00|1.7e+03|1.4e+00|6.5e-↙
04| chol 5  4
15|1.000|1.000|6.2e-03|3.7e-02|2.5e+05| 8.839745e+04| 0:0:00|6.4e+02|1.5e+00|3.6e-↙
04| chol 4  3
16|0.983|0.983|5.7e-03|6.7e-03|3.5e+04| 1.096546e+04| 0:0:00|3.4e+02|1.7e+00|7.3e-↙
05| chol 4  4
17|0.643|0.643|3.6e-03|5.2e-03|2.7e+04| 8.643528e+03| 0:0:00|1.5e+02|1.8e+00|5.7e-↙
05| chol 3  3
18|0.604|0.604|2.7e-03|4.3e-03|2.4e+04| 7.179202e+03| 0:0:00|9.0e+01|1.8e+00|4.7e-↙
05| chol 3  3
19|0.716|0.716|2.5e-03|3.7e-03|2.0e+04| 6.531375e+03| 0:0:00|5.8e+01|1.8e+00|4.0e-↙
05| chol 2  2
20|0.592|0.592|1.7e-03|2.8e-03|1.5e+04| 4.478945e+03| 0:0:00|4.6e+01|1.8e+00|3.0e-↙
05| chol 3  3
21|0.982|0.982|1.6e-03|1.9e-03|9.5e+03| 3.212311e+03| 0:0:00|3.0e+01|1.8e+00|2.1e-↙
05| chol 3  2
22|0.970|0.970|1.1e-03|9.4e-04|4.4e+03| 1.359400e+03| 0:0:00|1.9e+01|1.9e+00|1.0e-↙
05| chol 3  3
23|1.000|1.000|9.4e-04|5.7e-04|2.4e+03| 7.967565e+02| 0:0:00|8.7e+00|1.9e+00|6.2e-↙
06| chol 2  2
24|0.861|0.861|6.7e-04|3.7e-04|1.5e+03| 4.164464e+02| 0:0:00|5.5e+00|1.9e+00|3.7e-↙
06| chol 2  2
25|0.994|0.994|5.8e-04|2.4e-04|9.1e+02| 2.867070e+02| 0:0:00|3.1e+00|1.9e+00|2.3e-↙
06| chol 2  2
26|0.743|0.743|3.6e-04|1.7e-04|6.1e+02| 1.426803e+02| 0:0:00|2.2e+00|1.9e+00|1.5e-↙
06| chol 2  2
27|0.965|0.965|3.2e-04|1.1e-04|3.9e+02| 1.103563e+02| 0:0:00|1.3e+00|1.9e+00|9.3e-↙
07| chol 2  2
28|0.732|0.732|1.6e-04|8.7e-05|2.7e+02| 4.869169e+01| 0:0:00|9.5e-01|1.9e+00|5.9e-↙
07| chol 2  2
29|1.000|1.000|1.5e-04|4.9e-05|1.6e+02| 3.072610e+01| 0:0:00|5.6e-01|1.9e+00|3.5e-↙
07| chol 2  2
30|0.859|0.859|6.6e-05|3.6e-05|9.3e+01| 2.015584e+00| 0:0:00|3.6e-01|1.9e+00|1.9e-↙
07| chol 2  2
31|1.000|1.000|6.7e-05|2.0e-05|4.9e+01|-7.467953e+00| 0:0:00|1.9e-01|1.9e+00|1.1e-↙
07| chol 2  2
32|1.000|1.000|3.4e-05|1.5e-05|2.0e+01|-1.783124e+01| 0:0:00|9.8e-02|1.9e+00|4.4e-↙
08| chol 2  2
```

```
33|1.000|1.000|2.3e-05|1.1e-05|9.4e+00|-2.067044e+01| 0:0:00|4.2e-02|2.0e+00|2.1e-↙
08| chol 1  1
34|1.000|1.000|9.5e-06|8.7e-06|3.7e+00|-2.260036e+01| 0:0:00|2.0e-02|2.0e+00|8.4e-↙
09| chol 1  1
35|1.000|1.000|5.4e-06|7.1e-06|1.5e+00|-2.324752e+01| 0:0:00|7.9e-03|2.0e+00|3.4e-↙
09| chol 1  1
36|1.000|1.000|1.6e-06|6.2e-06|5.2e-01|-2.357200e+01| 0:0:00|3.2e-03|2.0e+00|1.2e-↙
09| chol 1  1
37|0.773|0.773|1.2e-06|5.6e-06|2.8e-01|-2.365037e+01| 0:0:00|1.6e-03|2.0e+00|6.4e-↙
10| chol 1  1
38|0.815|0.815|6.5e-07|5.1e-06|1.6e-01|-2.369974e+01| 0:0:00|7.8e-04|2.0e+00|3.7e-↙
10| chol 1  1
39|0.289|0.289|1.2e-06|4.3e-06|1.5e-01|-2.372911e+01| 0:0:00|6.6e-04|2.0e+00|3.1e-↙
10| chol 1  1
40|0.286|0.286|2.2e-06|3.5e-06|1.5e-01|-2.376720e+01| 0:0:01|5.6e-04|2.0e+00|2.3e-↙
10| chol 1  1
41|0.204|0.204|3.1e-06|3.0e-06|1.6e-01|-2.379409e+01| 0:0:01|5.2e-04|2.0e+00|2.0e-↙
10| chol 1  1
42|0.050|0.050|3.2e-06|2.9e-06|1.7e-01|-2.380234e+01| 0:0:01|5.1e-04|2.0e+00|1.8e-↙
10| chol 1  1
43|0.155|0.155|3.5e-06|2.6e-06|2.0e-01|-2.382341e+01| 0:0:01|4.9e-04|2.0e+00|1.4e-↙
10| chol 1  1
44|0.124|0.124|4.0e-06|2.3e-06|2.0e-01|-2.384824e+01| 0:0:01|4.8e-04|2.0e+00|6.5e-↙
11| chol 2  2
45|0.095|0.095|4.7e-06|2.1e-06|2.1e-01|-2.386725e+01| 0:0:01|4.8e-04|2.0e+00|4.0e-↙
11| chol 2  2
46|0.170|0.170|6.8e-06|1.8e-06|2.2e-01|-2.390631e+01| 0:0:01|4.8e-04|2.0e+00|0.↙
0e+00| chol 2  2
47|0.165|0.165|1.0e-05|1.5e-06|2.4e-01|-2.395631e+01| 0:0:01|4.8e-04|2.0e+00|0.↙
0e+00| chol 2  2
48|0.030|0.030|8.7e-06|1.5e-06|2.5e-01|-2.399417e+01| 0:0:01|4.8e-04|1.9e+00|0.↙
0e+00| chol 2  2
49|0.153|0.153|2.5e-05|1.3e-06|3.2e-01|-2.425104e+01| 0:0:01|5.1e-04|1.8e+00|0.↙
0e+00| chol
  SMW too ill-conditioned, switch to LU factor, 5.7e+26.
  switch to LU factor lu  5  7
50|0.058|0.058|9.1e-05|1.3e-06|5.2e-01|-2.459203e+01| 0:0:01|5.5e-04|1.7e+00|0.↙
0e+00|
  Stop: maximum number of iterations reached
-----------------------------------------------------------------
 number of iterations   = 50
 primal objective value = -2.52033367e+01
 dual   objective value = -2.39807319e+01
 gap := trace(XZ)       = 5.23e-01
 relative gap           = 2.04e-02
 actual relative gap    = -2.44e-02
 rel. primal infeas     = 9.08e-05
 rel. dual   infeas     = 1.27e-06
 norm(X), norm(y), norm(Z) = 1.5e+05, 7.8e+01, 4.3e+01
 norm(A), norm(b), norm(C) = 1.2e+04, 1.3e+04, 7.6e+01
 Total CPU time (secs)  = 0.62
 CPU time per iteration = 0.01
 termination code       = -6
 DIMACS errors: 9.1e-05  0.0e+00  1.3e-06  0.0e+00  -2.4e-02  1.0e-02
```

```
------------------------------------------------------------------

ans =

   23.9786

Iteration   7   Total error is: 0.019974

 num. of constraints = 85
 dim. of socp   var  = 86,   num. of socp blk  =  1
 dim. of linear var  = 800
 dim. of free   var  = 15
 *** convert ublk to linear blk
**********************************************************************↙
********
   SDPT3: homogeneous self-dual path-following algorithms
**********************************************************************↙
********
 version  predcorr  gam  expon
   HKM      1      0.000   1
it pstep dstep pinfeas dinfeas  gap     mean(obj)    cputime    kap    tau    theta
------------------------------------------------------------------------------↙
--------
 0|0.000|0.000|2.6e+00|1.6e+02|9.1e+08| 8.981002e+05| 0:0:00|9.1e+08|1.0e+00|1.↙
0e+00| chol 1  1
 1|0.000|0.000|2.6e+00|1.6e+02|9.1e+08| 8.982335e+05| 0:0:00|9.1e+08|1.0e+00|1.↙
0e+00| chol 1  1
 2|0.000|0.000|2.6e+00|1.6e+02|9.1e+08| 8.985400e+05| 0:0:00|9.1e+08|1.0e+00|1.↙
0e+00| chol 1  1
 3|0.021|0.021|2.5e+00|1.6e+02|8.9e+08| 8.997816e+05| 0:0:00|8.9e+08|1.0e+00|9.8e-↙
01| chol 1  1
 4|0.014|0.014|2.5e+00|1.6e+02|8.9e+08| 9.038192e+05| 0:0:00|8.8e+08|1.0e+00|9.7e-↙
01| chol 1  1
 5|0.186|0.186|2.1e+00|1.3e+02|7.4e+08| 9.116001e+05| 0:0:00|7.2e+08|9.9e-01|7.9e-↙
01| chol 1  1
 6|0.389|0.389|1.3e+00|8.3e+01|4.8e+08| 9.287458e+05| 0:0:00|4.5e+08|9.8e-01|5.0e-↙
01| chol 1  1
 7|0.814|0.814|2.5e-01|1.6e+01|9.4e+07| 9.245062e+05| 0:0:00|8.4e+07|9.8e-01|9.6e-↙
02| chol 1  1
 8|0.393|0.393|1.7e-01|1.1e+01|6.8e+07| 9.742053e+05| 0:0:00|5.4e+07|9.5e-01|6.3e-↙
02| chol 2  2
 9|0.745|0.745|4.8e-02|3.1e+00|2.0e+07| 9.291784e+05| 0:0:00|1.3e+07|9.7e-01|1.8e-↙
02| chol 2  2
10|0.538|0.538|3.2e-02|2.0e+00|1.5e+07| 9.949644e+05| 0:0:00|6.6e+06|9.2e-01|1.1e-↙
02| chol 2  2
11|0.680|0.680|1.4e-02|8.7e-01|6.5e+06| 7.978664e+05| 0:0:00|1.6e+06|9.9e-01|5.3e-↙
03| chol 2  2
12|0.822|0.822|5.6e-03|3.6e-01|2.7e+06| 5.400229e+05| 0:0:00|8.5e+04|1.1e+00|2.5e-↙
03| chol 3  3
13|0.789|0.789|2.8e-03|1.4e-01|1.0e+06| 2.896321e+05| 0:0:00|6.1e+03|1.3e+00|1.1e-↙
03| chol 4  4
14|0.840|0.840|1.0e-02|7.7e-02|5.8e+05| 1.789718e+05| 0:0:00|2.0e+03|1.4e+00|6.4e-↙
04| chol 3  4
15|1.000|1.000|6.7e-03|3.9e-02|2.7e+05| 9.449324e+04| 0:0:00|6.6e+02|1.5e+00|3.6e-↙
```

```
04| chol 4  3
16|1.000|1.000|5.9e-03|7.2e-03|3.7e+04| 1.131185e+04| 0:0:00|3.6e+02|1.7e+00|7.5e-↙
05| chol 3  4
17|0.651|0.651|3.5e-03|5.3e-03|2.7e+04| 8.487453e+03| 0:0:00|1.6e+02|1.8e+00|5.6e-↙
05| chol 3  3
18|0.505|0.505|2.9e-03|4.6e-03|2.4e+04| 7.169011e+03| 0:0:00|1.0e+02|1.8e+00|4.8e-↙
05| chol 3  3
19|0.769|0.769|2.6e-03|3.8e-03|2.0e+04| 6.443087e+03| 0:0:00|5.9e+01|1.8e+00|4.0e-↙
05| chol 3  3
20|0.564|0.564|1.9e-03|2.9e-03|1.6e+04| 4.450464e+03| 0:0:00|4.7e+01|1.8e+00|3.1e-↙
05| chol 3  3
21|0.947|0.947|1.9e-03|2.1e-03|1.0e+04| 3.459081e+03| 0:0:00|3.1e+01|1.8e+00|2.2e-↙
05| chol 3  3
22|0.933|0.933|1.4e-03|1.1e-03|5.0e+03| 1.501087e+03| 0:0:00|2.1e+01|1.9e+00|1.2e-↙
05| chol 3  3
23|1.000|1.000|1.1e-03|7.1e-04|2.8e+03| 9.070330e+02| 0:0:00|9.9e+00|1.9e+00|7.6e-↙
06| chol 4  2
24|0.781|0.781|8.0e-04|5.0e-04|1.9e+03| 5.169187e+02| 0:0:00|6.6e+00|1.9e+00|5.1e-↙
06| chol 2  2
25|0.993|0.993|7.2e-04|3.2e-04|1.1e+03| 3.627086e+02| 0:0:00|3.9e+00|1.9e+00|3.3e-↙
06| chol 2  2
26|0.729|0.729|5.0e-04|2.3e-04|7.7e+02| 1.765123e+02| 0:0:00|2.8e+00|1.9e+00|2.2e-↙
06| chol 2  2
27|0.968|0.968|4.6e-04|1.5e-04|4.9e+02| 1.468718e+02| 0:0:00|1.6e+00|1.9e+00|1.4e-↙
06| chol 2  2
28|0.623|0.623|2.9e-04|1.3e-04|3.8e+02| 6.901589e+01| 0:0:00|1.3e+00|1.9e+00|9.8e-↙
07| chol 2  2
29|0.989|0.989|2.7e-04|7.9e-05|2.4e+02| 6.022765e+01| 0:0:00|8.1e-01|1.9e+00|6.3e-↙
07| chol 2  2
30|0.687|0.687|1.6e-04|6.4e-05|1.7e+02| 2.018860e+01| 0:0:00|6.0e-01|1.9e+00|4.0e-↙
07| chol 2  2
31|0.963|0.963|1.5e-04|4.0e-05|1.1e+02| 1.547332e+01| 0:0:00|3.7e-01|1.9e+00|2.5e-↙
07| chol 2  2
32|0.752|0.752|7.2e-05|3.1e-05|7.5e+01|-3.143812e+00| 0:0:00|2.7e-01|1.9e+00|1.5e-↙
07| chol 2  2
33|0.997|0.997|7.2e-05|1.8e-05|4.2e+01|-8.444422e+00| 0:0:00|1.5e-01|1.9e+00|8.9e-↙
08| chol 2  2
34|0.989|0.989|4.0e-05|1.2e-05|1.8e+01|-1.683846e+01| 0:0:00|8.5e-02|1.9e+00|3.9e-↙
08| chol 2  2
35|1.000|1.000|3.4e-05|9.5e-06|9.3e+00|-1.900087e+01| 0:0:00|3.7e-02|1.9e+00|2.1e-↙
08| chol 2  2
36|1.000|1.000|1.9e-05|7.7e-06|4.0e+00|-2.075240e+01| 0:0:00|1.9e-02|2.0e+00|9.1e-↙
09| chol 2  2
37|0.984|0.984|1.3e-05|6.5e-06|1.9e+00|-2.128285e+01| 0:0:00|8.7e-03|2.0e+00|4.3e-↙
09| chol 1  1
38|0.963|0.963|4.9e-06|5.5e-06|9.8e-01|-2.161811e+01| 0:0:01|4.3e-03|2.0e+00|2.1e-↙
09| chol 1  1
39|0.853|0.853|4.0e-06|4.7e-06|5.4e-01|-2.173168e+01| 0:0:01|2.4e-03|2.0e+00|1.2e-↙
09| chol 1  1
40|0.846|0.846|2.7e-06|4.2e-06|2.1e-01|-2.185016e+01| 0:0:01|1.4e-03|2.0e+00|4.4e-↙
10| chol 1  1
41|0.239|0.239|2.7e-06|3.8e-06|2.1e-01|-2.188393e+01| 0:0:01|1.2e-03|2.0e+00|3.7e-↙
10| chol 1  1
42|0.246|0.246|2.9e-06|3.3e-06|2.2e-01|-2.192452e+01| 0:0:01|9.9e-04|2.0e+00|3.1e-↙
```

```
10| chol 1  2
43|0.042|0.042|3.0e-06|3.3e-06|2.4e-01|-2.193346e+01| 0:0:01|9.7e-04|2.0e+00|2.8e-↙
10| chol 1  1
44|0.177|0.177|3.3e-06|2.9e-06|2.7e-01|-2.196908e+01| 0:0:01|8.9e-04|2.0e+00|2.0e-↙
10| chol 1  2
45|0.143|0.143|4.0e-06|2.7e-06|3.1e-01|-2.200871e+01| 0:0:01|8.5e-04|2.0e+00|1.1e-↙
10| chol 2  1
46|0.177|0.177|4.7e-06|2.2e-06|3.2e-01|-2.204503e+01| 0:0:01|8.2e-04|2.0e+00|3.0e-↙
11| chol 2  3
47|0.031|0.031|4.9e-06|2.2e-06|3.3e-01|-2.205907e+01| 0:0:01|8.2e-04|2.0e+00|0.↙
0e+00| chol 2  2
48|0.136|0.136|6.9e-06|1.9e-06|3.6e-01|-2.213833e+01| 0:0:01|8.1e-04|1.9e+00|0.↙
0e+00| chol 2  2
49|0.135|0.135|1.4e-05|1.7e-06|4.4e-01|-2.238738e+01| 0:0:01|8.3e-04|1.9e+00|0.↙
0e+00| chol
  SMW too ill-conditioned, switch to LU factor, 3.0e+26.
  switch to LU factor lu  3  3
50|0.062|0.062|4.9e-05|1.6e-06|6.7e-01|-2.274815e+01| 0:0:01|8.8e-04|1.8e+00|0.↙
0e+00|
  Stop: maximum number of iterations reached
-----------------------------------------------------------------
 number of iterations   = 50
 primal objective value = -2.33971004e+01
 dual   objective value = -2.20991960e+01
 gap := trace(XZ)       = 6.69e-01
 relative gap           = 2.82e-02
 actual relative gap    = -2.79e-02
 rel. primal infeas     = 4.93e-05
 rel. dual   infeas     = 1.60e-06
 norm(X), norm(y), norm(Z) = 1.2e+05, 8.0e+01, 4.5e+01
 norm(A), norm(b), norm(C) = 1.3e+04, 1.5e+04, 7.6e+01
 Total CPU time (secs)  = 0.66
 CPU time per iteration = 0.01
 termination code       = -6
 DIMACS errors: 4.9e-05  0.0e+00  1.6e-06  0.0e+00  -2.8e-02  1.4e-02
-----------------------------------------------------------------

ans =

   22.0971

Iteration   8   Total error is: 0.019172
The total representation error of the testing signals is: 0.0241
>>
```