```
>> 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|1.6e+00|1.3e+02|1.6e+07| 1.488635e+04| 0:0:00|1.6e+07|1.0e+00|1.0e+00| ↙
chol 1  1
 1|0.003|0.003|1.6e+00|1.3e+02|1.6e+07| 1.492545e+04| 0:0:00|1.6e+07|1.0e+00|1.0e+00| ↙
chol 1  1
 2|0.009|0.009|1.6e+00|1.3e+02|1.6e+07| 1.502314e+04| 0:0:00|1.6e+07|1.0e+00|9.9e-01| ↙
chol 1  1
 3|0.298|0.298|1.1e+00|9.4e+01|1.1e+07| 1.536693e+04| 0:0:00|1.1e+07|9.9e-01|7.0e-01| ↙
chol 1  1
 4|0.298|0.298|8.0e-01|6.9e+01|8.6e+06| 1.589629e+04| 0:0:00|8.0e+06|9.8e-01|5.0e-01| ↙
chol 1  1
 5|0.887|0.887|9.5e-02|8.1e+00|1.0e+06| 1.607388e+04| 0:0:00|8.8e+05|9.8e-01|6.0e-02| ↙
chol 1  1
 6|0.327|0.327|7.4e-02|6.3e+00|9.0e+05| 1.752014e+04| 0:0:00|6.4e+05|9.3e-01|4.4e-02| ↙
chol 1  1
 7|0.618|0.618|3.4e-02|2.9e+00|4.3e+05| 1.749105e+04| 0:0:00|2.5e+05|9.3e-01|2.0e-02| ↙
chol 1  1
 8|0.714|0.714|2.0e-02|1.7e+00|3.3e+05| 2.055463e+04| 0:0:00|1.0e+05|8.2e-01|1.0e-02| ↙
chol 1  1
 9|0.734|0.734|5.7e-03|4.9e-01|8.2e+04| 1.257345e+04| 0:0:00|3.5e+03|1.0e+00|3.7e-03| ↙
chol 1  1
10|0.703|0.703|2.0e-03|1.7e-01|2.3e+04| 5.784403e+03| 0:0:00|1.5e+02|1.3e+00|1.7e-03| ↙
chol 1  1
11|0.931|0.931|3.8e-04|3.3e-02|4.4e+03| 1.555250e+03| 0:0:00|5.9e+00|1.6e+00|3.9e-04| ↙
chol 1  1
12|1.000|1.000|1.9e-04|1.6e-02|2.2e+03| 8.323468e+02| 0:0:00|7.4e+00|1.7e+00|2.0e-04| ↙
chol 1  1
13|1.000|1.000|9.7e-05|6.9e-03|9.4e+02| 3.414227e+02| 0:0:00|3.8e+00|1.7e+00|9.0e-05| ↙
chol 1  1
14|1.000|1.000|4.2e-05|2.8e-03|3.6e+02| 1.119171e+02| 0:0:00|1.7e+00|1.8e+00|3.7e-05| ↙
chol 1  1
15|1.000|1.000|2.4e-05|9.8e-04|1.3e+02| 1.612119e+01| 0:0:00|6.8e-01|1.8e+00|1.3e-05| ↙
chol 1  1
16|1.000|1.000|7.3e-06|3.2e-04|4.0e+01|-1.860173e+01| 0:0:00|2.4e-01|1.8e+00|4.2e-06| ↙
chol 1  1
17|1.000|1.000|3.6e-06|1.6e-04|1.9e+01|-2.678608e+01| 0:0:00|7.9e-02|1.8e+00|2.1e-06| ↙
chol 1  1
```

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18|0.903|0.903|3.1e-06|7.2e-05|6.9e+00|-3.198863e+01| 0:0:00|4.4e-02|1.8e+00|7.3e-07| ↙
chol 1  1
19|0.135|0.135|3.6e-06|7.2e-05|7.1e+00|-3.198277e+01| 0:0:00|4.1e-02|1.8e+00|7.1e-07| ↙
chol 1  1
20|0.071|0.071|4.4e-06|7.0e-05|7.3e+00|-3.206214e+01| 0:0:00|4.0e-02|1.7e+00|6.8e-07| ↙
chol 1  1
21|0.153|0.153|4.1e-06|6.4e-05|7.2e+00|-3.229486e+01| 0:0:00|3.6e-02|1.7e+00|6.4e-07| ↙
chol 1  1
22|0.088|0.088|6.6e-06|6.0e-05|7.5e+00|-3.252483e+01| 0:0:00|3.5e-02|1.7e+00|5.9e-07| ↙
chol 1  1
23|0.274|0.274|1.8e-05|5.1e-05|8.6e+00|-3.309486e+01| 0:0:00|3.2e-02|1.5e+00|4.5e-07| ↙
chol 1  1
24|0.390|0.390|7.8e-05|4.9e-05|1.2e+01|-3.380826e+01| 0:0:00|3.1e-02|1.3e+00|3.8e-07| ↙
chol 1  1
25|0.383|0.383|1.2e-04|4.2e-05|1.1e+01|-3.524577e+01| 0:0:00|2.6e-02|1.2e+00|3.3e-07| ↙
chol 2  2
26|0.436|0.436|2.0e-04|3.5e-05|9.5e+00|-3.691797e+01| 0:0:00|2.1e-02|1.3e+00|2.6e-07| ↙
chol 2  2
27|0.646|0.646|2.9e-04|2.3e-05|5.6e+00|-3.885068e+01| 0:0:00|1.5e-02|1.3e+00|1.8e-07| ↙
chol 2  2
28|0.492|0.492|3.1e-04|1.8e-05|4.1e+00|-3.959295e+01| 0:0:00|1.1e-02|1.4e+00|1.3e-07| ↙
chol 2  2
29|0.401|0.401|2.9e-04|1.5e-05|3.3e+00|-3.992658e+01| 0:0:00|8.8e-03|1.4e+00|1.1e-07| ↙
chol 2  2
30|0.467|0.467|2.5e-04|1.2e-05|2.6e+00|-4.023383e+01| 0:0:01|7.0e-03|1.4e+00|9.1e-08| ↙
chol 2  2
31|0.429|0.429|2.1e-04|9.9e-06|2.2e+00|-4.045790e+01| 0:0:01|5.7e-03|1.4e+00|7.6e-08| ↙
chol 2  2
32|0.308|0.308|1.8e-04|9.4e-06|2.2e+00|-4.055742e+01| 0:0:01|5.0e-03|1.4e+00|7.1e-08| ↙
chol 2  2
33|0.240|0.240|1.1e-04|8.7e-06|2.3e+00|-4.058735e+01| 0:0:01|4.8e-03|1.4e+00|6.4e-08| ↙
chol 2  3
34|0.299|0.299|4.9e-04|7.5e-06|2.8e+00|-4.064144e+01| 0:0:01|4.8e-03|1.3e+00|4.9e-08| ↙
chol 3  3
35|0.104|0.104|1.7e-03|7.5e-06|3.9e+00|-4.067263e+01| 0:0:01|5.2e-03|1.2e+00|4.4e-08| ↙
chol 3  5
36|0.097|0.097|3.7e-03|7.9e-06|5.8e+00|-4.071232e+01| 0:0:01|5.5e-03|1.1e+00|4.2e-08| ↙
chol 4  4
37|0.096|0.096|7.3e-03|8.7e-06|8.5e+00|-4.081241e+01| 0:0:01|6.0e-03|1.0e+00|4.5e-08| ↙
chol 4  4
38|0.034|0.034|9.0e-03|9.3e-06|1.1e+01|-4.080119e+01| 0:0:01|6.3e-03|9.7e-01|4.8e-08| ↙
chol 3  4
39|0.175|0.175|2.0e-02|1.2e-05|1.8e+01|-4.119489e+01| 0:0:01|7.9e-03|8.5e-01|6.1e-08| ↙
chol 4  4
40|0.049|0.049|2.5e-02|1.5e-05|2.0e+01|-4.126964e+01| 0:0:01|8.3e-03|8.6e-01|8.1e-08| ↙
chol 5  5
41|0.133|0.133|4.8e-02|2.9e-05|3.1e+01|-4.180443e+01| 0:0:01|1.0e-02|7.9e-01|1.6e-07| ↙
chol 4  4
42|0.152|0.152|9.9e-02|1.0e-04|6.9e+01|-3.970061e+01| 0:0:01|1.6e-02|5.7e-01|4.2e-07| ↙
chol 4  6
43|0.418|0.418|1.8e-01|4.7e-04|2.2e+02|-2.657861e+01| 0:0:01|3.3e-02|3.5e-01|1.3e-06| ↙
chol 6  6
44|0.898|0.898|9.0e-02|6.4e-04|1.4e+02|-1.431232e+01| 0:0:01|7.2e-02|4.3e-01|2.1e-06| ↙
chol 5  8
45|0.878|0.878|2.8e-01|1.0e-03|1.4e+02|-5.103606e+00| 0:0:01|1.0e-01|2.4e-01|1.9e-06| ↙
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chol 5  5
46|0.366|0.366|2.2e-01|9.8e-04|1.1e+02|-6.884632e+00| 0:0:01|7.0e-02|2.5e-01|1.8e-06| ↙
chol 5  6
47|0.844|0.844|2.4e-01|1.0e-03|8.1e+01|-7.708656e+00| 0:0:01|4.2e-02|2.3e-01|1.8e-06| ↙
chol 5  6
48|0.944|0.944|3.1e-01|1.1e-03|4.0e+01|-5.878714e+00| 0:0:01|2.6e-02|2.1e-01|1.8e-06| ↙
chol 6  6
49|1.000|1.000|3.4e-01|1.2e-03|2.1e+01|-4.948524e+00| 0:0:01|1.0e-02|2.0e-01|1.8e-06| ↙
chol 5  9
50|0.924|0.924|5.5e-01|1.2e-03|6.2e+00|-4.850707e+00| 0:0:01|5.1e-03|2.0e-01|1.8e-06|
  Stop: maximum number of iterations reached
-----------------------------------------------------------------
 number of iterations   = 50
 primal objective value =  6.49544263e+01
 dual   objective value = -7.48514745e+01
 gap := trace(XZ)       = 2.05e+01
 relative gap           = 2.89e-01
 actual relative gap    = 9.93e-01
 rel. primal infeas     = 3.45e-01
 rel. dual   infeas     = 1.17e-03
 norm(X), norm(y), norm(Z) = 4.4e+07, 1.1e+02, 6.4e+01
 norm(A), norm(b), norm(C) = 7.3e+03, 8.8e+02, 7.6e+01
 Total CPU time (secs)  = 0.81
 CPU time per iteration = 0.02
 termination code       = -6
 DIMACS errors: 3.4e-01  0.0e+00  1.2e-03  0.0e+00  9.9e-01  1.5e-01
-----------------------------------------------------------------

ans =

   74.8039


 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|9.2e+07| 9.036112e+04| 0:0:00|9.2e+07|1.0e+00|1.0e+00| ↙
chol 1  1
 1|0.001|0.001|2.5e+00|1.3e+02|9.2e+07| 9.039033e+04| 0:0:00|9.2e+07|1.0e+00|1.0e+00| ↙
chol 1  1
 2|0.002|0.002|2.5e+00|1.3e+02|9.2e+07| 9.049938e+04| 0:0:00|9.2e+07|1.0e+00|1.0e+00| ↙
chol 1  1
 3|0.107|0.107|2.3e+00|1.2e+02|8.3e+07| 9.076686e+04| 0:0:00|8.2e+07|1.0e+00|8.9e-01| ↙
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chol 1  1
 4|0.062|0.062|2.1e+00|1.1e+02|7.9e+07| 9.171510e+04| 0:0:00|7.8e+07|9.9e-01|8.4e-01| ↙
chol 1  1
 5|0.572|0.572|9.4e-01|5.0e+01|3.5e+07| 9.244444e+04| 0:0:00|3.4e+07|9.9e-01|3.7e-01| ↙
chol 1  1
 6|0.539|0.539|4.6e-01|2.4e+01|1.7e+07| 9.433318e+04| 0:0:00|1.6e+07|9.8e-01|1.8e-01| ↙
chol 1  1
 7|0.557|0.557|2.2e-01|1.1e+01|8.6e+06| 9.619742e+04| 0:0:00|7.3e+06|9.7e-01|8.3e-02| ↙
chol 1  1
 8|0.550|0.550|1.2e-01|6.4e+00|5.3e+06| 1.044310e+05| 0:0:00|3.6e+06|9.2e-01|4.4e-02| ↙
chol 1  1
 9|0.820|0.820|2.5e-02|1.3e+00|1.2e+06| 9.403097e+04| 0:0:00|5.0e+05|9.6e-01|9.5e-03| ↙
chol 1  1
10|0.709|0.709|1.4e-02|7.7e-01|7.9e+05| 9.174116e+04| 0:0:00|1.6e+05|9.3e-01|5.3e-03| ↙
chol 2  2
11|0.643|0.643|7.6e-03|4.0e-01|3.8e+05| 6.511243e+04| 0:0:00|3.8e+04|1.1e+00|3.2e-03| ↙
chol 2  2
12|0.712|0.712|2.8e-03|1.5e-01|1.2e+05| 3.049300e+04| 0:0:00|1.7e+03|1.3e+00|1.5e-03| ↙
chol 2  2
13|0.835|0.835|8.2e-04|3.6e-02|2.6e+04| 9.030271e+03| 0:0:00|6.3e+01|1.6e+00|4.3e-04| ↙
chol 4  2
14|1.000|1.000|2.1e-03|1.8e-02|1.5e+04| 5.773751e+03| 0:0:00|4.3e+01|1.6e+00|2.3e-04| ↙
chol 3  2
15|1.000|1.000|1.8e-03|6.2e-03|4.8e+03| 1.830206e+03| 0:0:00|2.5e+01|1.7e+00|8.0e-05| ↙
chol 2  2
16|0.973|0.973|1.2e-03|1.4e-03|9.4e+02| 3.063526e+02| 0:0:00|8.5e+00|1.8e+00|1.6e-05| ↙
chol 1  1
17|0.992|0.992|1.2e-04|1.1e-03|7.5e+02| 2.458026e+02| 0:0:00|1.9e+00|1.8e+00|1.3e-05| ↙
chol 1  1
18|0.960|0.960|5.7e-05|2.3e-04|1.5e+02| 2.696658e+01| 0:0:00|1.5e+00|1.8e+00|2.8e-06| ↙
chol 1  1
19|1.000|1.000|8.0e-06|1.1e-04|7.2e+01|-2.284657e-02| 0:0:00|3.0e-01|1.9e+00|1.3e-06| ↙
chol 1  1
20|1.000|1.000|5.8e-06|5.6e-05|3.0e+01|-1.601127e+01| 0:0:00|1.4e-01|1.9e+00|5.7e-07| ↙
chol 1  1
21|1.000|1.000|4.5e-06|3.5e-05|1.0e+01|-2.379149e+01| 0:0:00|5.8e-02|1.9e+00|2.1e-07| ↙
chol 1  1
22|1.000|1.000|4.3e-06|2.7e-05|2.9e+00|-2.660834e+01| 0:0:00|2.1e-02|2.0e+00|6.0e-08| ↙
chol 1  1
23|0.861|0.861|2.4e-06|2.4e-05|9.4e-01|-2.743219e+01| 0:0:00|8.1e-03|2.0e+00|2.0e-08| ↙
chol 1  1
24|0.504|0.504|3.0e-06|2.3e-05|7.1e-01|-2.756753e+01| 0:0:00|5.1e-03|2.0e+00|1.5e-08| ↙
chol 1  1
25|0.363|0.363|5.1e-06|2.2e-05|6.1e-01|-2.767875e+01| 0:0:00|3.8e-03|1.9e+00|1.2e-08| ↙
chol 1  1
26|0.381|0.381|1.4e-05|2.0e-05|5.9e-01|-2.789221e+01| 0:0:00|2.9e-03|1.9e+00|1.0e-08| ↙
chol 1  2
27|0.452|0.452|3.6e-05|1.9e-05|6.1e-01|-2.817474e+01| 0:0:00|2.2e-03|1.9e+00|8.8e-09| ↙
chol 2  2
28|0.596|0.596|6.1e-05|1.6e-05|5.9e-01|-2.844787e+01| 0:0:00|1.7e-03|1.8e+00|8.0e-09| ↙
chol 2  2
29|0.019|0.019|7.7e-05|1.6e-05|7.2e-01|-2.874000e+01| 0:0:00|1.7e-03|1.8e+00|0.0e+00| ↙
chol 2  2
30|0.206|0.206|2.1e-04|1.4e-05|1.2e+00|-2.928010e+01| 0:0:00|1.8e-03|1.6e+00|0.0e+00| ↙
chol 2  2
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31|0.132|0.132|5.7e-04|1.5e-05|2.8e+00|-3.094431e+01| 0:0:00|2.2e-03|1.3e+00|0.0e+00| ↙
chol 2  2
32|0.529|0.529|1.2e-03|9.4e-06|5.9e+00|-3.279745e+01| 0:0:00|3.5e-03|1.1e+00|9.5e-09| ↙
chol 2  2
33|0.365|0.365|1.3e-03|8.4e-06|1.0e+01|-3.344177e+01| 0:0:00|5.6e-03|8.4e-01|9.7e-09| ↙
chol 2  2
34|0.799|0.799|1.1e-03|4.6e-06|7.2e+00|-3.374560e+01| 0:0:00|8.5e-03|8.7e-01|1.8e-08| ↙
chol 2  2
35|0.428|0.428|1.1e-03|4.3e-06|6.8e+00|-3.393909e+01| 0:0:00|7.9e-03|8.6e-01|1.7e-08| ↙
chol 2  2
36|0.469|0.469|1.0e-03|3.6e-06|5.8e+00|-3.434272e+01| 0:0:00|6.7e-03|9.2e-01|1.5e-08| ↙
chol 2  2
37|0.572|0.572|1.0e-03|3.0e-06|4.8e+00|-3.480544e+01| 0:0:00|6.0e-03|9.4e-01|1.2e-08| ↙
chol 2  2
38|0.624|0.624|9.7e-04|2.2e-06|3.6e+00|-3.528390e+01| 0:0:00|5.9e-03|8.5e-01|7.7e-09| ↙
chol 2  2
39|0.550|0.550|8.9e-04|1.9e-06|3.2e+00|-3.540861e+01| 0:0:00|4.6e-03|8.3e-01|6.7e-09| ↙
chol 2  2
40|0.309|0.309|8.5e-04|1.9e-06|3.1e+00|-3.547021e+01| 0:0:00|4.2e-03|8.2e-01|6.3e-09| ↙
chol 2  2
41|0.162|0.162|8.9e-04|2.0e-06|3.5e+00|-3.554274e+01| 0:0:00|4.0e-03|8.0e-01|6.2e-09| ↙
chol 2  2
42|0.297|0.297|9.7e-04|1.9e-06|3.7e+00|-3.577931e+01| 0:0:00|3.9e-03|7.7e-01|5.7e-09| ↙
chol 2  3
43|0.314|0.314|1.1e-03|1.7e-06|3.7e+00|-3.608560e+01| 0:0:01|3.7e-03|7.6e-01|5.2e-09| ↙
chol 2  3
44|0.065|0.065|1.0e-03|1.9e-06|4.1e+00|-3.609040e+01| 0:0:01|3.7e-03|7.5e-01|5.2e-09| ↙
chol 2  2
45|0.119|0.119|1.0e-03|1.9e-06|4.6e+00|-3.613671e+01| 0:0:01|3.7e-03|7.4e-01|4.7e-09| ↙
chol 3  3
46|0.213|0.213|1.5e-03|1.7e-06|5.7e+00|-3.627748e+01| 0:0:01|4.0e-03|6.8e-01|3.7e-09| ↙
chol 3  4
47|0.130|0.130|6.4e-03|1.7e-06|8.9e+00|-3.652518e+01| 0:0:01|4.4e-03|6.1e-01|3.0e-09| ↙
chol 4  4
48|0.089|0.089|1.9e-02|1.8e-06|1.6e+01|-3.696722e+01| 0:0:01|5.0e-03|5.6e-01|2.9e-09| ↙
chol 5  6
49|0.098|0.098|4.4e-02|1.9e-06|2.6e+01|-3.798090e+01| 0:0:01|5.7e-03|5.3e-01|3.3e-09| ↙
chol 5  6
50|0.083|0.083|8.0e-02|2.0e-06|3.7e+01|-4.024146e+01| 0:0:01|6.3e-03|5.5e-01|4.4e-09|
  Stop: maximum number of iterations reached
-----------------------------------------------------------------
 number of iterations   = 50
 primal objective value = -4.00864782e+01
 dual   objective value = -4.03964488e+01
 gap := trace(XZ)       = 3.72e+01
 relative gap           = 9.02e-01
 actual relative gap    = 3.80e-03
 rel. primal infeas     = 7.99e-02
 rel. dual   infeas     = 2.02e-06
 norm(X), norm(y), norm(Z) = 1.9e+07, 6.2e+01, 2.3e+01
 norm(A), norm(b), norm(C) = 7.5e+03, 1.6e+03, 7.6e+01
 Total CPU time (secs)  = 0.61
 CPU time per iteration = 0.01
 termination code       = -6
 DIMACS errors: 8.0e-02  0.0e+00  2.0e-06  0.0e+00  3.8e-03  4.6e-01
```

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

ans =

   40.2948

Iteration   2   Total error is: 0.024912

 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|1.4e+02|2.1e+08| 2.098858e+05| 0:0:00|2.1e+08|1.0e+00|1.0e+00| ↙
chol 1  1
 1|0.000|0.000|2.4e+00|1.4e+02|2.1e+08| 2.099349e+05| 0:0:00|2.1e+08|1.0e+00|1.0e+00| ↙
chol 1  1
 2|0.001|0.001|2.4e+00|1.4e+02|2.1e+08| 2.100696e+05| 0:0:00|2.1e+08|1.0e+00|1.0e+00| ↙
chol 1  1
 3|0.049|0.049|2.3e+00|1.3e+02|2.0e+08| 2.104932e+05| 0:0:00|2.0e+08|1.0e+00|9.5e-01| ↙
chol 1  1
 4|0.035|0.035|2.3e+00|1.3e+02|2.0e+08| 2.119619e+05| 0:0:00|2.0e+08|9.9e-01|9.2e-01| ↙
chol 1  1
 5|0.417|0.417|1.3e+00|7.5e+01|1.2e+08| 2.135474e+05| 0:0:00|1.2e+08|9.9e-01|5.4e-01| ↙
chol 1  1
 6|0.510|0.510|6.9e-01|3.8e+01|6.2e+07| 2.173077e+05| 0:0:00|5.8e+07|9.8e-01|2.8e-01| ↙
chol 1  1
 7|0.646|0.646|2.6e-01|1.4e+01|2.4e+07| 2.190291e+05| 0:0:00|2.1e+07|9.8e-01|1.0e-01| ↙
chol 1  1
 8|0.504|0.504|1.5e-01|8.2e+00|1.5e+07| 2.328687e+05| 0:0:00|1.1e+07|9.4e-01|5.7e-02| ↙
chol 1  1
 9|0.813|0.813|3.1e-02|1.7e+00|3.3e+06| 2.151543e+05| 0:0:00|1.8e+06|9.7e-01|1.2e-02| ↙
chol 1  2
10|0.589|0.589|2.1e-02|1.2e+00|2.7e+06| 2.307251e+05| 0:0:00|8.4e+05|9.1e-01|7.8e-03| ↙
chol 2  2
11|0.633|0.633|1.1e-02|6.3e-01|1.4e+06| 1.860207e+05| 0:0:00|2.5e+05|9.8e-01|4.5e-03| ↙
chol 2  2
12|0.759|0.759|4.6e-03|2.6e-01|5.1e+05| 1.086824e+05| 0:0:00|1.2e+04|1.2e+00|2.2e-03| ↙
chol 2  2
13|0.809|0.809|1.8e-03|9.2e-02|1.8e+05| 5.384930e+04| 0:0:00|6.1e+02|1.4e+00|9.3e-04| ↙
chol 2  3
14|0.988|0.988|2.6e-03|2.9e-02|5.7e+04| 2.035254e+04| 0:0:00|1.9e+02|1.6e+00|3.3e-04| ↙
chol 3  3
15|0.954|0.954|2.1e-03|1.8e-02|3.5e+04| 1.282775e+04| 0:0:00|9.4e+01|1.6e+00|2.2e-04| ↙
chol 3  3
```

```
16|1.000|1.000|2.7e-03|2.8e-03|4.7e+03| 1.526905e+03| 0:0:00|5.4e+01|1.8e+00|3.7e-05| ↙
chol 3  5
17|0.850|0.850|1.6e-03|2.1e-03|3.4e+03| 1.092089e+03| 0:0:00|1.5e+01|1.8e+00|2.5e-05| ↙
chol 2  2
18|0.592|0.592|7.9e-04|1.9e-03|3.1e+03| 9.627478e+02| 0:0:00|1.0e+01|1.8e+00|2.2e-05| ↙
chol 1  2
19|0.910|0.910|3.0e-04|1.4e-03|2.4e+03| 7.716726e+02| 0:0:00|6.5e+00|1.8e+00|1.7e-05| ↙
chol 2  2
20|1.000|1.000|2.4e-04|6.9e-04|1.1e+03| 3.542916e+02| 0:0:00|4.6e+00|1.8e+00|8.7e-06| ↙
chol 2  2
21|1.000|1.000|7.5e-05|2.7e-04|4.0e+02| 1.120965e+02| 0:0:00|2.2e+00|1.8e+00|3.2e-06| ↙
chol 1  1
22|1.000|1.000|1.9e-05|1.3e-04|1.9e+02| 3.555535e+01| 0:0:00|8.0e-01|1.9e+00|1.5e-06| ↙
chol 1  1
23|1.000|1.000|1.2e-05|5.3e-05|6.9e+01|-3.309466e+00| 0:0:00|3.7e-01|1.9e+00|5.7e-07| ↙
chol 1  1
24|1.000|1.000|6.1e-06|2.9e-05|2.6e+01|-1.905818e+01| 0:0:00|1.3e-01|1.9e+00|2.3e-07| ↙
chol 1  1
25|1.000|1.000|5.2e-06|2.1e-05|7.6e+00|-2.529443e+01| 0:0:00|5.2e-02|2.0e+00|6.9e-08| ↙
chol 1  1
26|1.000|1.000|1.6e-06|1.8e-05|1.9e+00|-2.750662e+01| 0:0:00|1.6e-02|2.0e+00|1.7e-08| ↙
chol 1  1
27|1.000|1.000|6.0e-07|1.6e-05|7.3e-01|-2.792067e+01| 0:0:00|4.0e-03|2.0e+00|6.8e-09| ↙
chol 1  1
28|0.943|0.943|3.4e-07|1.4e-05|1.3e-01|-2.815958e+01| 0:0:00|1.7e-03|2.0e+00|1.2e-09| ↙
chol 1  1
29|0.383|0.383|3.5e-07|1.1e-05|1.1e-01|-2.817762e+01| 0:0:00|1.2e-03|2.0e+00|9.9e-10| ↙
chol 1  1
30|0.156|0.156|9.4e-07|1.0e-05|1.1e-01|-2.818912e+01| 0:0:00|1.0e-03|2.0e+00|8.8e-10| ↙
chol 1  1
31|0.079|0.079|1.5e-06|9.5e-06|1.1e-01|-2.820000e+01| 0:0:00|9.7e-04|2.0e+00|7.7e-10| ↙
chol 1  1
32|0.130|0.130|3.1e-06|8.4e-06|1.2e-01|-2.821980e+01| 0:0:00|8.7e-04|2.0e+00|5.8e-10| ↙
chol 1  1
33|0.036|0.036|3.5e-06|8.2e-06|1.2e-01|-2.823559e+01| 0:0:00|8.5e-04|2.0e+00|3.2e-10| ↙
chol 1  2
34|0.091|0.091|6.1e-06|7.5e-06|1.4e-01|-2.826346e+01| 0:0:00|8.0e-04|2.0e+00|5.2e-11| ↙
chol 2  2
35|0.077|0.077|8.3e-06|6.9e-06|1.5e-01|-2.828412e+01| 0:0:00|7.7e-04|2.0e+00|0.0e+00| ↙
chol 2  2
36|0.009|0.009|8.4e-06|6.9e-06|1.5e-01|-2.829465e+01| 0:0:00|7.6e-04|2.0e+00|0.0e+00| ↙
chol 2  2
37|0.146|0.146|1.9e-05|6.0e-06|1.8e-01|-2.841547e+01| 0:0:00|7.1e-04|1.9e+00|0.0e+00| ↙
chol 2  2
38|0.107|0.107|5.2e-05|5.5e-06|2.6e-01|-2.859708e+01| 0:0:01|7.0e-04|1.9e+00|0.0e+00| ↙
chol 2  3
39|0.091|0.091|1.0e-04|5.2e-06|3.7e-01|-2.879703e+01| 0:0:01|7.1e-04|1.8e+00|0.0e+00| ↙
chol 3  3
40|0.082|0.082|1.5e-04|4.9e-06|5.0e-01|-2.897822e+01| 0:0:01|7.3e-04|1.8e+00|0.0e+00| ↙
chol 2  2
41|0.090|0.090|2.1e-04|4.7e-06|7.1e-01|-2.925098e+01| 0:0:01|7.9e-04|1.7e+00|0.0e+00| ↙
chol 3  3
42|0.098|0.098|3.3e-04|4.6e-06|1.0e+00|-2.959723e+01| 0:0:01|8.9e-04|1.6e+00|0.0e+00| ↙
chol 5  3
43|0.114|0.114|5.0e-04|4.4e-06|1.5e+00|-2.996401e+01| 0:0:01|1.0e-03|1.4e+00|0.0e+00| ↙
```

```
chol 3  3
44|0.410|0.410|1.1e-03|3.4e-06|2.5e+00|-3.127906e+01| 0:0:01|1.8e-03|1.2e+00|0.0e+00| ↙
chol 6  3
45|0.291|0.291|1.3e-03|2.6e-06|3.0e+00|-3.145818e+01| 0:0:01|2.3e-03|1.1e+00|0.0e+00| ↙
chol 4  3
46|0.043|0.043|1.2e-03|2.6e-06|3.5e+00|-3.144041e+01| 0:0:01|2.4e-03|1.1e+00|1.4e-10| ↙
chol 2  3
47|0.423|0.423|1.1e-03|1.7e-06|4.4e+00|-3.149151e+01| 0:0:01|3.3e-03|9.6e-01|7.0e-10| ↙
chol 2  2
48|0.438|0.438|9.2e-04|1.2e-06|4.6e+00|-3.133458e+01| 0:0:01|4.0e-03|9.3e-01|1.7e-09| ↙
chol 2  3
49|0.355|0.355|7.4e-04|1.1e-06|5.4e+00|-3.097854e+01| 0:0:01|4.5e-03|8.7e-01|3.1e-09| ↙
chol 2  2
50|0.410|0.410|6.0e-04|1.0e-06|5.6e+00|-3.091559e+01| 0:0:01|5.0e-03|8.1e-01|3.3e-09|
  Stop: maximum number of iterations reached
-----------------------------------------------------------------
 number of iterations   = 50
 primal objective value = -3.07484676e+01
 dual   objective value = -3.10827080e+01
 gap := trace(XZ)       = 5.64e+00
 relative gap           = 1.77e-01
 actual relative gap    = 5.32e-03
 rel. primal infeas     = 6.05e-04
 rel. dual   infeas     = 1.05e-06
 norm(X), norm(y), norm(Z) = 2.9e+05, 7.2e+01, 3.4e+01
 norm(A), norm(b), norm(C) = 8.6e+03, 3.6e+03, 7.6e+01
 Total CPU time (secs)  = 0.70
 CPU time per iteration = 0.01
 termination code       = -6
 DIMACS errors: 6.0e-04  0.0e+00  1.0e-06  0.0e+00  5.3e-03  9.0e-02
-----------------------------------------------------------------

ans =

   30.9314

Iteration   3   Total error is: 0.02231

 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|1.4e+02|3.1e+08| 3.024577e+05| 0:0:00|3.1e+08|1.0e+00|1.0e+00| ↙
chol 1  1
```

```
 1|0.000|0.000|2.6e+00|1.4e+02|3.1e+08| 3.025185e+05| 0:0:00|3.1e+08|1.0e+00|1.0e+00| ↙
chol 1  1
 2|0.001|0.001|2.6e+00|1.4e+02|3.1e+08| 3.026773e+05| 0:0:00|3.1e+08|1.0e+00|1.0e+00| ↙
chol 1  1
 3|0.036|0.036|2.5e+00|1.4e+02|3.0e+08| 3.032200e+05| 0:0:00|3.0e+08|1.0e+00|9.7e-01| ↙
chol 1  1
 4|0.026|0.026|2.4e+00|1.3e+02|2.9e+08| 3.050573e+05| 0:0:00|2.9e+08|1.0e+00|9.4e-01| ↙
chol 1  1
 5|0.348|0.348|1.6e+00|8.8e+01|2.0e+08| 3.074038e+05| 0:0:00|1.9e+08|9.9e-01|6.2e-01| ↙
chol 1  1
 6|0.481|0.481|8.7e-01|4.7e+01|1.1e+08| 3.128304e+05| 0:0:00|1.0e+08|9.8e-01|3.3e-01| ↙
chol 1  1
 7|0.710|0.710|2.6e-01|1.4e+01|3.3e+07| 3.134091e+05| 0:0:00|3.0e+07|9.8e-01|1.0e-01| ↙
chol 1  1
 8|0.447|0.447|1.7e-01|9.1e+00|2.3e+07| 3.334959e+05| 0:0:00|1.7e+07|9.4e-01|6.1e-02| ↙
chol 1  1
 9|0.806|0.806|3.6e-02|2.0e+00|5.2e+06| 3.109608e+05| 0:0:00|2.9e+06|9.7e-01|1.4e-02| ↙
chol 2  2
10|0.555|0.555|2.5e-02|1.4e+00|4.3e+06| 3.381515e+05| 0:0:00|1.5e+06|9.0e-01|8.8e-03| ↙
chol 2  2
11|0.630|0.630|1.4e-02|7.5e-01|2.4e+06| 2.876873e+05| 0:0:00|4.8e+05|9.5e-01|5.1e-03| ↙
chol 2  2
12|0.769|0.769|5.6e-03|3.1e-01|8.8e+05| 1.757151e+05| 0:0:00|2.4e+04|1.1e+00|2.5e-03| ↙
chol 2  2
13|0.794|0.794|2.3e-03|1.1e-01|3.1e+05| 8.995416e+04| 0:0:00|1.2e+03|1.3e+00|1.1e-03| ↙
chol 3  3
14|1.000|1.000|3.5e-03|3.7e-02|1.0e+05| 3.639326e+04| 0:0:00|3.0e+02|1.5e+00|4.0e-04| ↙
chol 3  3
15|0.858|0.858|4.4e-03|1.6e-02|4.1e+04| 1.503802e+04| 0:0:00|1.7e+02|1.6e+00|1.9e-04| ↙
chol 3  3
16|1.000|1.000|2.4e-03|7.5e-03|1.9e+04| 6.877749e+03| 0:0:00|6.6e+01|1.7e+00|9.2e-05| ↙
chol 4  3
17|1.000|1.000|2.0e-03|2.9e-03|6.9e+03| 2.247321e+03| 0:0:00|3.2e+01|1.8e+00|3.4e-05| ↙
chol 2  3
18|0.977|0.977|8.6e-04|2.2e-03|5.2e+03| 1.663740e+03| 0:0:00|1.4e+01|1.8e+00|2.5e-05| ↙
chol 2  2
19|1.000|1.000|4.9e-04|1.1e-03|2.6e+03| 8.582948e+02| 0:0:00|1.0e+01|1.8e+00|1.3e-05| ↙
chol 2  2
20|1.000|1.000|1.8e-04|4.4e-04|9.3e+02| 2.673068e+02| 0:0:00|5.1e+00|1.8e+00|5.0e-06| ↙
chol 2  2
21|1.000|1.000|7.5e-05|2.1e-04|4.4e+02| 1.240024e+02| 0:0:00|1.8e+00|1.8e+00|2.4e-06| ↙
chol 1  1
22|1.000|1.000|1.2e-05|9.5e-05|1.9e+02| 3.480801e+01| 0:0:00|8.6e-01|1.9e+00|1.1e-06| ↙
chol 1  1
23|1.000|1.000|1.5e-05|4.2e-05|7.1e+01|-1.963853e+00| 0:0:00|3.7e-01|1.9e+00|4.2e-07| ↙
chol 1  1
24|1.000|1.000|6.0e-06|2.6e-05|2.5e+01|-1.840138e+01| 0:0:00|1.4e-01|1.9e+00|1.6e-07| ↙
chol 1  1
25|1.000|1.000|4.1e-06|2.0e-05|7.0e+00|-2.453801e+01| 0:0:00|5.2e-02|2.0e+00|4.5e-08| ↙
chol 1  1
26|1.000|1.000|9.4e-07|1.8e-05|1.8e+00|-2.655286e+01| 0:0:00|1.5e-02|2.0e+00|1.2e-08| ↙
chol 1  1
27|1.000|1.000|2.5e-07|1.6e-05|6.4e-01|-2.698573e+01| 0:0:00|3.9e-03|2.0e+00|4.2e-09| ↙
chol 1  1
28|0.748|0.748|9.8e-08|1.4e-05|2.6e-01|-2.714128e+01| 0:0:00|2.0e-03|2.0e+00|1.7e-09| ↙
```

```
chol 1  1
29|0.847|0.847|7.4e-08|8.1e-06|1.3e-01|-2.720466e+01| 0:0:00|7.8e-04|2.0e+00|8.2e-10| ↙
chol 1  1
30|0.180|0.180|1.2e-07|7.3e-06|1.2e-01|-2.721051e+01| 0:0:00|6.9e-04|2.0e+00|7.6e-10| ↙
chol 1  1
31|0.159|0.159|2.0e-07|6.2e-06|1.2e-01|-2.721931e+01| 0:0:00|6.2e-04|2.0e+00|6.7e-10| ↙
chol 1  1
32|0.095|0.095|3.8e-07|5.6e-06|1.2e-01|-2.723000e+01| 0:0:00|5.9e-04|2.0e+00|5.4e-10| ↙
chol 1  1
33|0.053|0.053|1.2e-06|5.3e-06|1.2e-01|-2.724484e+01| 0:0:00|5.7e-04|2.0e+00|3.9e-10| ↙
chol 1  2
34|0.038|0.038|2.2e-06|5.1e-06|1.3e-01|-2.726551e+01| 0:0:00|5.6e-04|2.0e+00|1.2e-10|
  Stop: steps too short consecutively
-----------------------------------------------------------------
 number of iterations   = 34
 primal objective value = -2.72681199e+01
 dual   objective value = -2.72628913e+01
 gap := trace(XZ)       = 1.29e-01
 relative gap           = 4.55e-03
 actual relative gap    = -9.42e-05
 rel. primal infeas     = 2.22e-06
 rel. dual   infeas     = 5.14e-06
 norm(X), norm(y), norm(Z) = 2.7e+03, 7.6e+01, 4.1e+01
 norm(A), norm(b), norm(C) = 9.6e+03, 4.9e+03, 7.6e+01
 Total CPU time (secs)  = 0.42
 CPU time per iteration = 0.01
 termination code       = -5
 DIMACS errors: 2.2e-06  0.0e+00  5.1e-06  0.0e+00  -9.4e-05  2.3e-03
-----------------------------------------------------------------

ans =

   27.2620

Iteration   4   Total error is: 0.021284

 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|1.4e+02|3.8e+08| 3.766092e+05| 0:0:00|3.8e+08|1.0e+00|1.0e+00| ↙
chol 1  1
 1|0.000|0.000|2.5e+00|1.4e+02|3.8e+08| 3.766805e+05| 0:0:00|3.8e+08|1.0e+00|1.0e+00| ↙
chol 1  1
```

```
 2|0.001|0.001|2.5e+00|1.4e+02|3.8e+08| 3.768669e+05| 0:0:00|3.8e+08|1.0e+00|1.0e+00| ↙
chol 1  1
 3|0.028|0.028|2.5e+00|1.4e+02|3.7e+08| 3.775469e+05| 0:0:00|3.7e+08|1.0e+00|9.7e-01| ↙
chol 1  1
 4|0.024|0.024|2.4e+00|1.3e+02|3.7e+08| 3.797899e+05| 0:0:00|3.6e+08|1.0e+00|9.5e-01| ↙
chol 1  1
 5|0.308|0.308|1.7e+00|9.4e+01|2.6e+08| 3.830966e+05| 0:0:00|2.5e+08|9.9e-01|6.7e-01| ↙
chol 1  1
 6|0.463|0.463|9.4e-01|5.2e+01|1.5e+08| 3.902188e+05| 0:0:00|1.4e+08|9.8e-01|3.7e-01| ↙
chol 1  1
 7|0.780|0.780|2.2e-01|1.2e+01|3.5e+07| 3.885884e+05| 0:0:00|3.1e+07|9.8e-01|8.4e-02| ↙
chol 1  1
 8|0.363|0.363|1.6e-01|8.7e+00|2.8e+07| 4.184143e+05| 0:0:00|2.1e+07|9.4e-01|5.9e-02| ↙
chol 1  1
 9|0.792|0.792|3.7e-02|2.0e+00|6.8e+06| 3.914930e+05| 0:0:00|3.8e+06|9.6e-01|1.4e-02| ↙
chol 2  2
10|0.564|0.564|2.5e-02|1.4e+00|5.5e+06| 4.249994e+05| 0:0:00|1.9e+06|9.0e-01|9.0e-03| ↙
chol 2  2
11|0.653|0.653|1.3e-02|7.1e-01|2.8e+06| 3.489004e+05| 0:0:00|5.4e+05|9.6e-01|4.9e-03| ↙
chol 2  2
12|0.766|0.766|5.2e-03|2.9e-01|1.0e+06| 2.101259e+05| 0:0:00|2.7e+04|1.1e+00|2.4e-03| ↙
chol 2  3
13|0.796|0.796|2.1e-03|1.0e-01|3.5e+05| 1.042906e+05| 0:0:00|1.3e+03|1.4e+00|1.0e-03| ↙
chol 5  4
14|0.983|0.983|4.5e-03|3.9e-02|1.4e+05| 4.801371e+04| 0:0:00|4.1e+02|1.5e+00|4.2e-04| ↙
chol 3  3
15|0.921|0.921|5.0e-03|1.6e-02|5.1e+04| 1.856103e+04| 0:0:00|2.0e+02|1.6e+00|1.8e-04| ↙
chol 3  4
16|1.000|1.000|2.7e-03|4.9e-03|1.4e+04| 5.254389e+03| 0:0:00|7.8e+01|1.8e+00|6.1e-05| ↙
chol 3  3
17|0.957|0.957|1.7e-03|2.7e-03|8.1e+03| 2.642178e+03| 0:0:00|2.8e+01|1.8e+00|3.3e-05| ↙
chol 3  3
18|0.815|0.815|1.2e-03|2.2e-03|6.5e+03| 2.126900e+03| 0:0:00|1.8e+01|1.8e+00|2.6e-05| ↙
chol 2  2
19|0.973|0.973|3.3e-04|1.6e-03|4.7e+03| 1.464514e+03| 0:0:00|1.3e+01|1.8e+00|1.9e-05| ↙
chol 2  2
20|1.000|1.000|6.4e-04|9.5e-04|2.7e+03| 9.452261e+02| 0:0:00|9.2e+00|1.8e+00|1.2e-05| ↙
chol 2  2
21|0.927|0.927|2.7e-04|3.8e-04|9.8e+02| 2.815122e+02| 0:0:00|5.6e+00|1.8e+00|4.2e-06| ↙
chol 2  2
22|1.000|1.000|1.2e-04|2.1e-04|5.2e+02| 1.557184e+02| 0:0:00|2.0e+00|1.8e+00|2.3e-06| ↙
chol 2  2
23|1.000|1.000|3.1e-05|1.0e-04|2.4e+02| 5.220876e+01| 0:0:00|1.0e+00|1.9e+00|1.1e-06| ↙
chol 1  1
24|1.000|1.000|2.4e-05|4.4e-05|9.3e+01| 9.510629e+00| 0:0:00|4.7e-01|1.9e+00|4.3e-07| ↙
chol 1  1
25|1.000|1.000|7.1e-06|2.6e-05|3.7e+01|-1.113629e+01| 0:0:00|1.8e-01|1.9e+00|1.8e-07| ↙
chol 1  1
26|1.000|1.000|7.0e-06|1.9e-05|1.2e+01|-1.869828e+01| 0:0:00|7.4e-02|2.0e+00|6.0e-08| ↙
chol 1  1
27|1.000|1.000|1.9e-06|1.6e-05|3.1e+00|-2.192620e+01| 0:0:00|2.5e-02|2.0e+00|1.6e-08| ↙
chol 1  1
28|1.000|1.000|8.2e-07|1.4e-05|1.3e+00|-2.254991e+01| 0:0:00|6.7e-03|2.0e+00|6.5e-09| ↙
chol 1  1
29|0.970|0.970|3.4e-07|1.3e-05|2.7e-01|-2.293356e+01| 0:0:00|2.8e-03|2.0e+00|1.4e-09| ↙
```

```
chol 1  1
30|0.853|0.853|1.7e-07|1.2e-05|1.4e-01|-2.299309e+01| 0:0:00|9.3e-04|2.0e+00|7.5e-10| ↙
chol 1  1
31|0.348|0.348|1.3e-06|9.5e-06|1.4e-01|-2.303939e+01| 0:0:00|7.1e-04|2.0e+00|5.8e-10| ↙
chol 1  1
32|0.026|0.026|1.4e-06|9.3e-06|1.4e-01|-2.304870e+01| 0:0:00|7.0e-04|2.0e+00|5.3e-10| ↙
chol 1  2
33|0.050|0.050|2.0e-06|8.9e-06|1.5e-01|-2.307543e+01| 0:0:00|6.8e-04|2.0e+00|3.4e-10| ↙
chol 1  1
34|0.136|0.136|3.4e-06|7.7e-06|1.8e-01|-2.312655e+01| 0:0:00|6.4e-04|2.0e+00|1.7e-10| ↙
chol 1  2
35|0.110|0.110|3.9e-06|6.9e-06|1.9e-01|-2.315671e+01| 0:0:00|6.1e-04|2.0e+00|7.8e-11| ↙
chol 1  2
36|0.011|0.011|4.0e-06|6.9e-06|2.0e-01|-2.315852e+01| 0:0:00|6.1e-04|2.0e+00|1.0e-10| ↙
chol 1  2
37|0.042|0.042|4.0e-06|6.6e-06|2.1e-01|-2.318670e+01| 0:0:00|6.0e-04|2.0e+00|0.0e+00| ↙
chol 2  2
38|0.086|0.086|5.3e-06|6.0e-06|2.3e-01|-2.324271e+01| 0:0:00|5.9e-04|2.0e+00|0.0e+00| ↙
chol 2  2
39|0.207|0.207|1.5e-05|4.8e-06|2.8e-01|-2.342351e+01| 0:0:00|5.8e-04|1.9e+00|0.0e+00| ↙
chol 2  2
40|0.107|0.107|2.2e-05|4.4e-06|3.4e-01|-2.353758e+01| 0:0:00|5.9e-04|1.9e+00|0.0e+00| ↙
chol 2  2
41|0.024|0.024|2.3e-05|4.3e-06|3.7e-01|-2.357768e+01| 0:0:00|5.9e-04|1.9e+00|0.0e+00| ↙
chol 2  2
42|0.076|0.076|3.1e-05|4.0e-06|4.6e-01|-2.370945e+01| 0:0:00|6.2e-04|1.9e+00|0.0e+00| ↙
chol 2  2
43|0.018|0.018|3.2e-05|4.0e-06|5.0e-01|-2.376270e+01| 0:0:01|6.3e-04|1.8e+00|0.0e+00| ↙
chol 2  3
44|0.149|0.149|6.1e-05|3.7e-06|7.7e-01|-2.430657e+01| 0:0:01|7.4e-04|1.7e+00|0.0e+00| ↙
chol 2  3
45|0.130|0.130|1.8e-04|3.7e-06|1.6e+00|-2.519754e+01| 0:0:01|9.2e-04|1.5e+00|0.0e+00| ↙
chol 2  2
46|0.254|0.254|5.1e-04|3.5e-06|3.9e+00|-2.677452e+01| 0:0:01|1.5e-03|1.2e+00|0.0e+00| ↙
chol 2  2
47|0.680|0.680|1.0e-03|1.6e-06|8.7e+00|-2.903359e+01| 0:0:01|4.3e-03|8.5e-01|1.3e-09| ↙
chol 2  2
48|0.606|0.606|7.6e-04|8.1e-07|7.3e+00|-2.854932e+01| 0:0:01|6.5e-03|8.7e-01|2.7e-09| ↙
chol 3  2
49|0.424|0.424|6.3e-04|8.1e-07|7.3e+00|-2.820178e+01| 0:0:01|6.8e-03|8.6e-01|3.2e-09| ↙
chol 2  2
50|0.093|0.093|6.1e-04|9.4e-07|7.9e+00|-2.814318e+01| 0:0:01|6.8e-03|8.5e-01|3.3e-09|
  Stop: maximum number of iterations reached
-----------------------------------------------------------------
 number of iterations   = 50
 primal objective value = -2.75743249e+01
 dual   objective value = -2.87120338e+01
 gap := trace(XZ)       = 7.92e+00
 relative gap           = 2.72e-01
 actual relative gap    = 1.99e-02
 rel. primal infeas     = 6.06e-04
 rel. dual   infeas     = 9.39e-07
 norm(X), norm(y), norm(Z) = 5.1e+05, 7.4e+01, 3.7e+01
 norm(A), norm(b), norm(C) = 9.1e+03, 6.3e+03, 7.6e+01
 Total CPU time (secs)  = 0.58
```

```
 CPU time per iteration = 0.01
 termination code       = -6
 DIMACS errors: 6.1e-04  0.0e+00  9.4e-07  0.0e+00  2.0e-02  1.4e-01
------------------------------------------------------------------

ans =

   28.5515

Iteration   5   Total error is: 0.021576

 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|3.1e+00|1.5e+02|3.0e+08| 2.998175e+05| 0:0:00|3.0e+08|1.0e+00|1.0e+00| ↙
chol 1  1
 1|0.000|0.000|3.1e+00|1.5e+02|3.0e+08| 2.998772e+05| 0:0:00|3.0e+08|1.0e+00|1.0e+00| ↙
chol 1  1
 2|0.001|0.001|3.1e+00|1.5e+02|3.0e+08| 3.000241e+05| 0:0:00|3.0e+08|1.0e+00|1.0e+00| ↙
chol 1  1
 3|0.036|0.036|3.0e+00|1.4e+02|2.9e+08| 3.005454e+05| 0:0:00|2.9e+08|1.0e+00|9.6e-01| ↙
chol 1  1
 4|0.021|0.021|3.0e+00|1.4e+02|2.9e+08| 3.023008e+05| 0:0:00|2.9e+08|1.0e+00|9.5e-01| ↙
chol 1  1
 5|0.318|0.318|2.0e+00|9.6e+01|2.0e+08| 3.047554e+05| 0:0:00|2.0e+08|9.9e-01|6.5e-01| ↙
chol 1  1
 6|0.472|0.472|1.1e+00|5.2e+01|1.1e+08| 3.104343e+05| 0:0:00|1.1e+08|9.8e-01|3.5e-01| ↙
chol 1  1
 7|0.729|0.729|3.2e-01|1.5e+01|3.3e+07| 3.107656e+05| 0:0:00|2.9e+07|9.8e-01|1.0e-01| ↙
chol 1  1
 8|0.460|0.460|2.0e-01|9.1e+00|2.2e+07| 3.287841e+05| 0:0:00|1.7e+07|9.5e-01|6.0e-02| ↙
chol 1  1
 9|0.797|0.797|4.4e-02|2.1e+00|5.2e+06| 3.064874e+05| 0:0:00|3.0e+06|9.7e-01|1.4e-02| ↙
chol 2  2
10|0.535|0.535|3.2e-02|1.5e+00|4.5e+06| 3.402747e+05| 0:0:00|1.6e+06|9.0e-01|9.2e-03| ↙
chol 2  3
11|0.626|0.626|1.8e-02|8.5e-01|2.7e+06| 3.026217e+05| 0:0:00|5.6e+05|9.3e-01|5.4e-03| ↙
chol 3  2
12|0.780|0.780|7.6e-03|3.6e-01|1.0e+06| 1.928742e+05| 0:0:00|2.9e+04|1.1e+00|2.7e-03| ↙
chol 3  3
13|0.791|0.791|3.1e-03|1.4e-01|3.7e+05| 1.040685e+05| 0:0:00|1.5e+03|1.3e+00|1.2e-03| ↙
chol 3  3
14|1.000|1.000|3.4e-03|4.4e-02|1.2e+05| 4.138354e+04| 0:0:00|2.9e+02|1.5e+00|4.5e-04| ↙
```

```
chol 3  4
15|0.727|0.727|4.5e-03|1.9e-02|4.8e+04| 1.716871e+04| 0:0:00|2.0e+02|1.6e+00|2.1e-04| ↙
chol 3  4
16|1.000|1.000|2.6e-03|1.1e-02|2.7e+04| 9.882211e+03| 0:0:00|7.8e+01|1.7e+00|1.3e-04| ↙
chol 3  3
17|0.894|0.894|2.5e-03|4.0e-03|8.9e+03| 3.179574e+03| 0:0:00|4.9e+01|1.8e+00|4.8e-05| ↙
chol 3  3
18|1.000|1.000|2.1e-03|2.9e-03|6.5e+03| 2.072486e+03| 0:0:00|1.7e+01|1.8e+00|3.3e-05| ↙
chol 2  2
19|1.000|1.000|1.1e-03|1.7e-03|3.8e+03| 1.205640e+03| 0:0:00|1.3e+01|1.8e+00|2.0e-05| ↙
chol 2  2
20|1.000|1.000|5.0e-04|8.5e-04|1.8e+03| 5.232172e+02| 0:0:00|7.4e+00|1.8e+00|9.2e-06| ↙
chol 2  2
21|1.000|1.000|1.8e-04|3.8e-04|7.7e+02| 2.229694e+02| 0:0:00|3.5e+00|1.8e+00|4.1e-06| ↙
chol 2  2
22|1.000|1.000|4.9e-05|1.6e-04|3.0e+02| 7.297256e+01| 0:0:00|1.5e+00|1.9e+00|1.7e-06| ↙
chol 1  1
23|1.000|1.000|1.7e-05|6.2e-05|1.1e+02| 1.174842e+01| 0:0:00|6.0e-01|1.9e+00|6.3e-07| ↙
chol 1  1
24|1.000|1.000|6.9e-06|3.1e-05|3.9e+01|-1.331347e+01| 0:0:00|2.1e-01|1.9e+00|2.3e-07| ↙
chol 1  1
25|1.000|1.000|5.2e-06|2.1e-05|1.1e+01|-2.277842e+01| 0:0:00|7.6e-02|2.0e+00|6.8e-08| ↙
chol 1  1
26|1.000|1.000|1.5e-06|1.8e-05|2.4e+00|-2.587877e+01| 0:0:00|2.2e-02|2.0e+00|1.6e-08| ↙
chol 1  1
27|1.000|1.000|3.4e-07|1.6e-05|8.0e-01|-2.651020e+01| 0:0:00|5.2e-03|2.0e+00|5.2e-09| ↙
chol 1  1
28|0.847|0.847|1.1e-07|1.4e-05|1.6e-01|-2.677164e+01| 0:0:00|2.3e-03|2.0e+00|1.1e-09| ↙
chol 1  1
29|0.737|0.737|2.1e-08|8.9e-06|7.8e-02|-2.681189e+01| 0:0:00|8.5e-04|2.0e+00|5.1e-10| ↙
chol 1  1
30|0.511|0.511|1.1e-07|6.1e-06|6.1e-02|-2.682462e+01| 0:0:00|5.1e-04|2.0e+00|3.9e-10| ↙
chol 1  1
31|0.050|0.050|1.1e-07|5.9e-06|6.1e-02|-2.682705e+01| 0:0:00|4.9e-04|2.0e+00|3.7e-10| ↙
chol 1  1
32|0.059|0.059|1.9e-07|5.6e-06|6.1e-02|-2.683042e+01| 0:0:00|4.7e-04|2.0e+00|3.4e-10| ↙
chol 1  1
33|0.075|0.075|2.5e-07|5.2e-06|6.1e-02|-2.683348e+01| 0:0:00|4.4e-04|2.0e+00|3.2e-10| ↙
chol 1  1
34|0.085|0.085|2.6e-07|4.7e-06|6.3e-02|-2.684023e+01| 0:0:00|4.2e-04|2.0e+00|2.5e-10|
  Stop: steps too short consecutively
------------------------------------------------------------------
 number of iterations   = 34
 primal objective value = -2.68306981e+01
 dual   objective value = -2.68497659e+01
 gap := trace(XZ)       = 6.27e-02
 relative gap           = 2.25e-03
 actual relative gap    = 3.49e-04
 rel. primal infeas     = 2.59e-07
 rel. dual   infeas     = 4.73e-06
 norm(X), norm(y), norm(Z) = 9.0e+02, 7.6e+01, 4.1e+01
 norm(A), norm(b), norm(C) = 1.1e+04, 6.0e+03, 7.6e+01
 Total CPU time (secs)  = 0.37
 CPU time per iteration = 0.01
 termination code       = -5
```

```
 DIMACS errors: 2.6e-07  0.0e+00  4.7e-06  0.0e+00  3.5e-04  1.1e-03
------------------------------------------------------------------

ans =

   26.8491

Iteration   6   Total error is: 0.021135

 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|7.5e+08| 7.399509e+05| 0:0:00|7.5e+08|1.0e+00|1.0e+00| ↙
chol 1  1
 1|0.000|0.000|2.6e+00|1.6e+02|7.5e+08| 7.400652e+05| 0:0:00|7.5e+08|1.0e+00|1.0e+00| ↙
chol 1  1
 2|0.000|0.000|2.6e+00|1.6e+02|7.5e+08| 7.403325e+05| 0:0:00|7.5e+08|1.0e+00|1.0e+00| ↙
chol 1  1
 3|0.021|0.021|2.5e+00|1.5e+02|7.4e+08| 7.414020e+05| 0:0:00|7.3e+08|1.0e+00|9.8e-01| ↙
chol 1  1
 4|0.015|0.015|2.5e+00|1.5e+02|7.3e+08| 7.448808e+05| 0:0:00|7.2e+08|1.0e+00|9.7e-01| ↙
chol 1  1
 5|0.214|0.214|2.0e+00|1.2e+02|5.9e+08| 7.511174e+05| 0:0:00|5.7e+08|9.9e-01|7.7e-01| ↙
chol 1  1
 6|0.397|0.397|1.2e+00|7.6e+01|3.7e+08| 7.653207e+05| 0:0:00|3.5e+08|9.8e-01|4.7e-01| ↙
chol 1  1
 7|0.807|0.807|2.5e-01|1.5e+01|7.6e+07| 7.619603e+05| 0:0:00|6.8e+07|9.8e-01|9.5e-02| ↙
chol 1  2
 8|0.388|0.388|1.7e-01|1.0e+01|5.6e+07| 8.056115e+05| 0:0:00|4.4e+07|9.5e-01|6.3e-02| ↙
chol 2  2
 9|0.760|0.760|4.5e-02|2.8e+00|1.6e+07| 7.643189e+05| 0:0:00|9.8e+06|9.7e-01|1.7e-02| ↙
chol 2  2
10|0.531|0.531|3.1e-02|1.9e+00|1.2e+07| 8.252021e+05| 0:0:00|5.2e+06|9.1e-01|1.1e-02| ↙
chol 2  2
11|0.668|0.668|1.4e-02|8.6e-01|5.7e+06| 6.778506e+05| 0:0:00|1.4e+06|9.8e-01|5.4e-03| ↙
chol 3  3
12|0.810|0.810|5.8e-03|3.6e-01|2.3e+06| 4.497040e+05| 0:0:00|7.1e+04|1.1e+00|2.5e-03| ↙
chol 3  3
13|0.799|0.799|2.6e-03|1.4e-01|8.3e+05| 2.381170e+05| 0:0:00|3.8e+03|1.3e+00|1.1e-03| ↙
chol 4  4
14|0.867|0.867|8.5e-03|6.7e-02|4.3e+05| 1.361955e+05| 0:0:00|1.3e+03|1.4e+00|6.0e-04| ↙
chol 6  8
15|1.000|1.000|4.9e-03|3.2e-02|1.9e+05| 6.599488e+04| 0:0:00|5.2e+02|1.5e+00|3.1e-04| ↙
```

```
chol 4  5
16|0.999|0.999|4.2e-03|5.4e-03|2.4e+04| 7.659639e+03| 0:0:00|2.5e+02|1.7e+00|5.9e-05| ↙
chol 5  4
17|0.741|0.741|2.6e-03|3.9e-03|1.8e+04| 5.559127e+03| 0:0:00|9.1e+01|1.8e+00|4.3e-05| ↙
chol 3  4
18|0.773|0.773|2.0e-03|3.1e-03|1.4e+04| 4.429933e+03| 0:0:00|4.6e+01|1.8e+00|3.4e-05| ↙
chol 3  3
19|0.588|0.588|1.9e-03|2.7e-03|1.3e+04| 4.100502e+03| 0:0:00|3.6e+01|1.8e+00|2.9e-05| ↙
chol 2  2
20|0.609|0.609|1.2e-03|2.1e-03|1.1e+04| 2.935137e+03| 0:0:00|2.9e+01|1.8e+00|2.3e-05| ↙
chol 3  3
21|0.986|0.986|1.3e-03|1.4e-03|6.5e+03| 2.113321e+03| 0:0:00|2.1e+01|1.8e+00|1.5e-05| ↙
chol 2  3
22|0.963|0.963|8.0e-04|6.8e-04|2.8e+03| 8.283520e+02| 0:0:00|1.3e+01|1.9e+00|7.2e-06| ↙
chol 3  3
23|1.000|1.000|6.3e-04|4.1e-04|1.6e+03| 5.065930e+02| 0:0:00|5.7e+00|1.9e+00|4.2e-06| ↙
chol 2  2
24|0.747|0.747|3.6e-04|3.1e-04|1.2e+03| 2.958801e+02| 0:0:00|3.9e+00|1.9e+00|2.8e-06| ↙
chol 2  2
25|1.000|1.000|3.3e-04|1.9e-04|7.4e+02| 2.268745e+02| 0:0:00|2.4e+00|1.9e+00|1.8e-06| ↙
chol 2  2
26|0.894|0.894|1.2e-04|1.1e-04|3.9e+02| 8.142322e+01| 0:0:00|1.6e+00|1.9e+00|8.9e-07| ↙
chol 2  2
27|1.000|1.000|1.2e-04|5.9e-05|2.1e+02| 4.937501e+01| 0:0:00|8.0e-01|1.9e+00|5.1e-07| ↙
chol 2  2
28|1.000|1.000|4.5e-05|3.4e-05|8.6e+01| 2.949408e+00| 0:0:00|4.3e-01|1.9e+00|2.0e-07| ↙
chol 2  2
29|1.000|1.000|3.4e-05|1.9e-05|3.9e+01|-9.443893e+00| 0:0:00|1.7e-01|1.9e+00|9.4e-08| ↙
chol 2  2
30|1.000|1.000|1.5e-05|1.4e-05|1.1e+01|-1.925934e+01| 0:0:00|7.7e-02|2.0e+00|2.7e-08| ↙
chol 1  1
31|1.000|1.000|7.6e-06|1.1e-05|3.5e+00|-2.137187e+01| 0:0:00|2.2e-02|2.0e+00|9.3e-09| ↙
chol 1  1
32|1.000|1.000|1.8e-06|9.5e-06|8.8e-01|-2.233732e+01| 0:0:00|7.6e-03|2.0e+00|2.3e-09| ↙
chol 1  1
33|0.944|0.944|8.6e-07|8.4e-06|3.9e-01|-2.251653e+01| 0:0:00|2.2e-03|2.0e+00|1.0e-09| ↙
chol 1  1
34|0.849|0.849|9.1e-07|7.6e-06|2.0e-01|-2.262677e+01| 0:0:00|1.1e-03|2.0e+00|5.3e-10| ↙
chol 2  2
35|0.105|0.105|1.7e-06|7.2e-06|2.2e-01|-2.264646e+01| 0:0:00|9.9e-04|2.0e+00|5.2e-10| ↙
chol 2  2
36|0.011|0.011|1.9e-06|7.2e-06|2.3e-01|-2.266242e+01| 0:0:00|9.8e-04|2.0e+00|4.6e-10| ↙
chol 1  2
37|0.081|0.081|2.9e-06|6.7e-06|2.6e-01|-2.271574e+01| 0:0:01|9.5e-04|2.0e+00|3.4e-10| ↙
chol 1  1
38|0.166|0.166|4.0e-06|5.7e-06|3.1e-01|-2.279378e+01| 0:0:01|8.9e-04|2.0e+00|2.1e-10| ↙
chol 2  2
39|0.058|0.058|4.3e-06|5.6e-06|3.5e-01|-2.281370e+01| 0:0:01|8.7e-04|2.0e+00|1.8e-10| ↙
chol 2  2
40|0.214|0.214|5.1e-06|4.4e-06|3.7e-01|-2.289803e+01| 0:0:01|8.5e-04|2.0e+00|0.0e+00| ↙
chol 2  2
41|0.262|0.262|1.0e-05|3.3e-06|4.0e-01|-2.307250e+01| 0:0:01|8.5e-04|2.0e+00|0.0e+00| ↙
chol 2  2
42|0.219|0.219|1.5e-05|2.6e-06|4.3e-01|-2.317858e+01| 0:0:01|8.5e-04|1.9e+00|0.0e+00| ↙
chol 2  2
```

```
43|0.066|0.066|1.6e-05|2.5e-06|4.6e-01|-2.322246e+01| 0:0:01|8.6e-04|1.9e+00|0.0e+00| ↙
chol 2  2
44|0.100|0.100|2.1e-05|2.2e-06|5.0e-01|-2.330627e+01| 0:0:01|8.8e-04|1.9e+00|0.0e+00| ↙
chol 2  2
45|0.018|0.018|2.1e-05|2.2e-06|5.2e-01|-2.332971e+01| 0:0:01|8.9e-04|1.9e+00|0.0e+00| ↙
chol 2  3
46|0.118|0.118|2.9e-05|2.0e-06|6.1e-01|-2.351270e+01| 0:0:01|9.3e-04|1.9e+00|0.0e+00| ↙
chol 2  2
47|0.135|0.135|5.9e-05|1.8e-06|8.7e-01|-2.397553e+01| 0:0:01|1.0e-03|1.7e+00|0.0e+00| ↙
chol
  SMW too ill-conditioned, switch to LU factor, 1.8e+26.
  switch to LU factor lu  3  4
48|0.127|0.127|2.0e-04|1.8e-06|1.6e+00|-2.472548e+01| 0:0:01|1.2e-03|1.5e+00|0.0e+00| ↙
lu  3  4
49|0.220|0.220|5.1e-04|1.7e-06|3.5e+00|-2.590211e+01| 0:0:01|1.8e-03|1.2e+00|0.0e+00| ↙
lu ^ 2  3
50|0.446|0.446|1.0e-03|1.3e-06|7.7e+00|-2.731796e+01| 0:0:01|3.5e-03|9.7e-01|8.5e-10|
  Stop: maximum number of iterations reached
-----------------------------------------------------------------
 number of iterations   = 50
 primal objective value = -2.82827149e+01
 dual   objective value = -2.63532064e+01
 gap := trace(XZ)       = 7.65e+00
 relative gap           = 2.70e-01
 actual relative gap    = -3.47e-02
 rel. primal infeas     = 9.99e-04
 rel. dual   infeas     = 1.26e-06
 norm(X), norm(y), norm(Z) = 9.2e+05, 7.4e+01, 3.8e+01
 norm(A), norm(b), norm(C) = 1.2e+04, 1.2e+04, 7.6e+01
 Total CPU time (secs)  = 0.67
 CPU time per iteration = 0.01
 termination code       = -6
 DIMACS errors: 1.0e-03  0.0e+00  1.3e-06  0.0e+00  -3.5e-02  1.4e-01
-----------------------------------------------------------------

ans =

   26.1572

Iteration   7   Total error is: 0.020725

 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|1.6e+02|9.0e+08| 8.915837e+05| 0:0:00|9.0e+08|1.0e+00|1.0e+00| ↙
chol 1  1
 1|0.000|0.000|2.7e+00|1.6e+02|9.0e+08| 8.917180e+05| 0:0:00|9.0e+08|1.0e+00|1.0e+00| ↙
chol 1  1
 2|0.000|0.000|2.7e+00|1.6e+02|9.0e+08| 8.920177e+05| 0:0:00|9.0e+08|1.0e+00|1.0e+00| ↙
chol 1  1
 3|0.019|0.019|2.6e+00|1.6e+02|8.9e+08| 8.932632e+05| 0:0:00|8.8e+08|1.0e+00|9.8e-01| ↙
chol 1  1
 4|0.014|0.014|2.6e+00|1.5e+02|8.8e+08| 8.972508e+05| 0:0:00|8.7e+08|1.0e+00|9.7e-01| ↙
chol 1  1
 5|0.198|0.198|2.1e+00|1.3e+02|7.2e+08| 9.046381e+05| 0:0:00|7.0e+08|9.9e-01|7.8e-01| ↙
chol 1  1
 6|0.398|0.398|1.3e+00|7.8e+01|4.6e+08| 9.208352e+05| 0:0:00|4.3e+08|9.8e-01|4.8e-01| ↙
chol 1  1
 7|0.809|0.809|2.6e-01|1.5e+01|9.2e+07| 9.163765e+05| 0:0:00|8.3e+07|9.8e-01|9.6e-02| ↙
chol 1  2
 8|0.380|0.380|1.8e-01|1.1e+01|6.8e+07| 9.670171e+05| 0:0:00|5.4e+07|9.5e-01|6.4e-02| ↙
chol 2  2
 9|0.748|0.748|5.1e-02|3.0e+00|2.0e+07| 9.220811e+05| 0:0:00|1.3e+07|9.7e-01|1.8e-02| ↙
chol 2  2
10|0.535|0.535|3.3e-02|2.0e+00|1.5e+07| 9.895129e+05| 0:0:00|6.7e+06|9.2e-01|1.1e-02| ↙
chol 2  2
11|0.661|0.661|1.6e-02|9.3e-01|7.3e+06| 8.366626e+05| 0:0:00|1.9e+06|9.7e-01|5.7e-03| ↙
chol 2  2
12|0.820|0.820|6.5e-03|3.8e-01|3.0e+06| 5.705366e+05| 0:0:00|9.9e+04|1.1e+00|2.7e-03| ↙
chol 3  3
13|0.796|0.796|2.9e-03|1.5e-01|1.1e+06| 3.094441e+05| 0:0:00|5.4e+03|1.3e+00|1.2e-03| ↙
chol 5  5
14|0.891|0.891|9.0e-03|7.3e-02|5.7e+05| 1.781001e+05| 0:0:00|1.6e+03|1.4e+00|6.3e-04| ↙
chol 4  5
15|1.000|1.000|6.1e-03|3.7e-02|2.7e+05| 9.330290e+04| 0:0:00|6.9e+02|1.5e+00|3.5e-04| ↙
chol 4  6
16|0.969|0.969|6.0e-03|6.7e-03|3.7e+04| 1.156755e+04| 0:0:00|3.6e+02|1.7e+00|7.2e-05| ↙
chol 4  5
17|0.684|0.684|3.5e-03|5.1e-03|2.9e+04| 9.066065e+03| 0:0:00|1.5e+02|1.8e+00|5.6e-05| ↙
chol 3  4
18|0.706|0.706|2.6e-03|4.2e-03|2.4e+04| 7.386479e+03| 0:0:00|8.1e+01|1.8e+00|4.6e-05| ↙
chol 3  3
19|0.677|0.677|2.6e-03|3.7e-03|2.1e+04| 6.868155e+03| 0:0:00|5.7e+01|1.8e+00|4.0e-05| ↙
chol 4  3
20|0.583|0.583|1.7e-03|3.0e-03|1.8e+04| 5.046608e+03| 0:0:00|4.8e+01|1.8e+00|3.2e-05| ↙
chol 3  3
21|0.971|0.971|1.8e-03|2.1e-03|1.1e+04| 3.708641e+03| 0:0:00|3.5e+01|1.8e+00|2.3e-05| ↙
chol 3  5
22|0.909|0.909|1.3e-03|8.2e-04|3.6e+03| 1.047387e+03| 0:0:00|2.3e+01|1.9e+00|9.0e-06| ↙
chol 4  3
23|0.984|0.984|9.6e-04|5.4e-04|2.2e+03| 7.054596e+02| 0:0:00|7.4e+00|1.9e+00|5.7e-06| ↙
chol 3  5
24|0.621|0.621|6.9e-04|4.3e-04|1.8e+03| 4.484642e+02| 0:0:00|5.7e+00|1.9e+00|4.3e-06| ↙
chol 3  3
25|0.959|0.959|6.4e-04|3.0e-04|1.2e+03| 3.835904e+02| 0:0:00|3.8e+00|1.9e+00|3.0e-06| ↙
chol 2  2
26|0.753|0.753|3.9e-04|2.1e-04|8.2e+02| 1.866022e+02| 0:0:00|2.8e+00|1.9e+00|1.9e-06| ↙
chol 3  4
```

```
27|1.000|1.000|3.6e-04|1.3e-04|4.9e+02| 1.399133e+02| 0:0:00|1.7e+00|1.9e+00|1.1e-06| ↙
chol 2  3
28|0.805|0.805|1.8e-04|9.4e-05|3.2e+02| 5.653856e+01| 0:0:00|1.2e+00|1.9e+00|6.7e-07| ↙
chol 2  2
29|1.000|1.000|1.7e-04|5.5e-05|1.8e+02| 3.729886e+01| 0:0:00|6.6e-01|1.9e+00|4.0e-07| ↙
chol 2  2
30|0.915|0.915|7.5e-05|3.6e-05|9.8e+01| 1.807777e+00| 0:0:00|4.1e-01|1.9e+00|1.9e-07| ↙
chol 2  2
31|1.000|1.000|7.1e-05|2.1e-05|5.2e+01|-7.309614e+00| 0:0:00|2.0e-01|1.9e+00|1.1e-07| ↙
chol 2  2
32|1.000|1.000|3.5e-05|1.5e-05|2.0e+01|-1.855456e+01| 0:0:00|1.0e-01|1.9e+00|4.1e-08| ↙
chol 2  2
33|1.000|1.000|2.4e-05|1.1e-05|8.9e+00|-2.142496e+01| 0:0:00|4.1e-02|2.0e+00|1.9e-08| ↙
chol 2  1
34|1.000|1.000|1.0e-05|8.7e-06|3.1e+00|-2.340789e+01| 0:0:00|1.9e-02|2.0e+00|6.6e-09| ↙
chol 1  1
35|0.995|0.995|5.0e-06|7.1e-06|1.1e+00|-2.398144e+01| 0:0:00|6.6e-03|2.0e+00|2.5e-09| ↙
chol 1  1
36|1.000|1.000|1.3e-06|6.2e-06|3.3e-01|-2.428323e+01| 0:0:00|2.5e-03|2.0e+00|7.0e-10| ↙
chol 1  1
37|0.852|0.852|1.0e-06|5.6e-06|1.6e-01|-2.434843e+01| 0:0:00|9.8e-04|2.0e+00|3.6e-10| ↙
chol 1  2
38|0.353|0.353|2.0e-06|4.6e-06|1.6e-01|-2.440137e+01| 0:0:00|7.6e-04|2.0e+00|2.8e-10| ↙
chol 2  2
39|0.064|0.064|2.4e-06|4.4e-06|1.7e-01|-2.441889e+01| 0:0:00|7.3e-04|2.0e+00|2.5e-10| ↙
chol 2  2
40|0.140|0.140|3.2e-06|4.0e-06|1.9e-01|-2.444824e+01| 0:0:00|6.8e-04|2.0e+00|2.1e-10| ↙
chol 1  2
41|0.237|0.237|4.1e-06|3.3e-06|2.1e-01|-2.449276e+01| 0:0:00|6.2e-04|2.0e+00|1.6e-10| ↙
chol 1  2
42|0.188|0.188|4.9e-06|2.7e-06|2.2e-01|-2.453187e+01| 0:0:00|5.9e-04|2.0e+00|6.6e-11| ↙
chol 2  2
43|0.322|0.322|8.1e-06|1.9e-06|2.1e-01|-2.460771e+01| 0:0:00|5.5e-04|2.0e+00|0.0e+00| ↙
chol 2  2
44|0.130|0.130|9.8e-06|1.7e-06|2.2e-01|-2.463162e+01| 0:0:00|5.4e-04|2.0e+00|0.0e+00| ↙
chol 2  2
45|0.197|0.197|1.3e-05|1.4e-06|2.2e-01|-2.466902e+01| 0:0:00|5.3e-04|2.0e+00|0.0e+00| ↙
chol 2  3
46|0.029|0.029|1.3e-05|1.4e-06|2.2e-01|-2.468117e+01| 0:0:01|5.3e-04|2.0e+00|0.0e+00| ↙
chol 2  2
47|0.108|0.108|1.5e-05|1.2e-06|2.4e-01|-2.473519e+01| 0:0:01|5.3e-04|1.9e+00|0.0e+00| ↙
chol 2  2
48|0.045|0.045|1.8e-05|1.2e-06|2.7e-01|-2.479694e+01| 0:0:01|5.3e-04|1.9e+00|0.0e+00| ↙
chol 2  3
49|0.077|0.077|3.3e-05|1.1e-06|3.3e-01|-2.494468e+01| 0:0:01|5.5e-04|1.9e+00|0.0e+00| ↙
chol
  SMW too ill-conditioned, switch to LU factor, 5.4e+26.
  switch to LU factor lu  3  4
50|0.102|0.102|9.2e-05|1.1e-06|5.2e-01|-2.529674e+01| 0:0:01|6.0e-04|1.7e+00|0.0e+00|
  Stop: maximum number of iterations reached
-----------------------------------------------------------------
 number of iterations   = 50
 primal objective value = -2.58671862e+01
 dual   objective value = -2.47262943e+01
 gap := trace(XZ)       = 5.18e-01
```

```
 relative gap           = 1.97e-02
 actual relative gap    = -2.21e-02
 rel. primal infeas     = 9.16e-05
 rel. dual   infeas     = 1.08e-06
 norm(X), norm(y), norm(Z) = 1.6e+05, 7.7e+01, 4.2e+01
 norm(A), norm(b), norm(C) = 1.2e+04, 1.4e+04, 7.6e+01
 Total CPU time (secs)  = 0.58
 CPU time per iteration = 0.01
 termination code       = -6
 DIMACS errors: 9.2e-05  0.0e+00  1.1e-06  0.0e+00  -2.2e-02  1.0e-02
------------------------------------------------------------------

ans =

   24.7218

Iteration   8   Total error is: 0.020264
The total representation error of the testing signals is: 0.19665
>>
```