

```
>> demo_Polynomial_Dictionary_Learning
```

```
Starting to train the dictionary
```

```
solving the quadratic problem with YALMIP...
```

```
num. of constraints = 25
dim. of socp var = 26, num. of socp blk = 1
dim. of linear var = 800
2 linear variables from unrestricted variable.
```

```
*** 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|2.1e+00|1.5e+01|1.3e+06| 1.118478e+04| 0:0:00|1.3e+06|1.0e+00|1.0e+00| ✓
chol 1 1
1|0.955|0.955|9.1e-02|6.6e-01|7.2e+04| 1.017331e+04| 0:0:00|1.6e+04|1.0e+00|4.6e-02| ✓
chol 1 1
2|0.980|0.980|3.6e-02|2.6e-01|3.7e+04| 7.375903e+03| 0:0:00|9.3e+02|1.0e+00|1.7e-02| ✓
chol 1 1
3|0.745|0.745|9.5e-03|6.8e-02|7.6e+03| 2.061424e+03| 0:0:00|3.1e+01|1.3e+00|5.8e-03| ✓
chol 1 1
4|1.000|1.000|1.1e-03|7.7e-03|9.4e+02| 2.615225e+02| 0:0:00|8.6e+00|1.4e+00|7.1e-04| ✓
chol 1 1
5|0.813|0.813|6.6e-04|5.0e-03|6.1e+02| 1.497735e+02| 0:0:00|3.1e+00|1.3e+00|4.3e-04| ✓
chol 1 1
6|1.000|1.000|4.2e-04|3.1e-03|4.0e+02| 7.581802e+01| 0:0:00|1.1e+00|1.3e+00|2.7e-04| ✓
chol 1 1
7|1.000|1.000|1.8e-04|1.4e-03|1.7e+02| 4.680963e+00| 0:0:00|6.2e-01|1.3e+00|1.2e-04| ✓
chol 1 1
8|1.000|1.000|8.4e-05|6.6e-04|7.7e+01|-2.416423e+01| 0:0:00|2.6e-01|1.4e+00|5.5e-05| ✓
chol 1 1
9|1.000|1.000|3.6e-05|3.0e-04|3.2e+01|-3.787898e+01| 0:0:00|1.2e-01|1.4e+00|2.4e-05| ✓
chol 1 1
10|1.000|1.000|1.2e-05|1.4e-04|1.0e+01|-4.479764e+01| 0:0:00|4.8e-02|1.5e+00|8.5e-06| ✓
chol 1 1
11|1.000|1.000|5.2e-06|9.7e-05|4.1e+00|-4.666568e+01| 0:0:00|1.5e-02|1.6e+00|4.0e-06| ✓
chol 1 1
12|1.000|1.000|1.1e-06|7.7e-05|7.8e-01|-4.781919e+01| 0:0:00|6.4e-03|1.7e+00|9.2e-07| ✓
chol 1 1
13|1.000|1.000|3.2e-07|6.8e-05|2.1e-01|-4.801120e+01| 0:0:00|1.1e-03|1.9e+00|2.9e-07| ✓
chol 1 1
14|0.962|0.962|2.2e-08|2.9e-05|1.4e-02|-4.808757e+01| 0:0:00|4.7e-04|1.9e+00|2.1e-08| ✓
chol 1 1
15|0.977|0.977|1.9e-09|1.1e-05|1.1e-03|-4.809139e+01| 0:0:00|3.9e-05|2.0e+00|1.7e-09| ✓
chol 1 1
16|0.991|0.991|1.4e-09|4.4e-06|1.2e-04|-4.809154e+01| 0:0:00|2.8e-06|2.0e+00|1.9e-10| ✓
chol 1 1
17|1.000|1.000|2.3e-08|1.7e-06|3.8e-05|-4.809154e+01| 0:0:00|2.9e-07|2.0e+00|5.1e-11| ✓
```

```

chol 1 1
18|0.993|0.993|9.0e-09|1.7e-06|7.3e-07|-4.809155e+01| 0:0:00|9.2e-08|2.0e+00|0.0e+00| ✓
chol 1 1
19|0.998|0.998|4.1e-09|1.7e-06|1.3e-08|-4.809155e+01| 0:0:00|2.0e-09|2.0e+00|0.0e+00| ✓
chol 1 1
20|1.000|1.000|2.9e-09|1.7e-06|3.3e-10|-4.809155e+01| 0:0:00|3.4e-11|2.0e+00|0.0e+00|
    lack of progress in infeas
-----
number of iterations      = 20
primal objective value = -4.80915288e+01
dual   objective value = -4.80915498e+01
gap := trace(XZ)         = 3.80e-05
relative gap              = 7.75e-07
actual relative gap       = 2.16e-07
rel. primal infeas        = 2.28e-08
rel. dual   infeas        = 1.74e-06
norm(X), norm(y), norm(Z) = 3.9e+00, 7.0e+01, 2.0e+01
norm(A), norm(b), norm(C) = 8.0e+02, 1.1e+00, 7.6e+01
Total CPU time (secs)    = 0.17
CPU time per iteration   = 0.01
termination code         = -9
DIMACS errors: 2.3e-08  0.0e+00  1.7e-06  0.0e+00  2.2e-07  3.9e-07
-----

ans =

    48.0915

num. of constraints = 25
dim. of socp var   = 26,   num. of socp blk = 1
dim. of linear var = 800
2 linear variables from unrestricted variable.

*** 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|1.5e+01|1.4e+06| 1.202399e+04| 0:0:00|1.4e+06|1.0e+00|1.0e+00| ✓
chol 1 1
1|0.954|0.954|1.2e-01|6.8e-01|8.0e+04| 1.102097e+04| 0:0:00|1.9e+04|1.0e+00|4.7e-02| ✓
chol 1 1
2|0.772|0.772|7.1e-02|4.0e-01|6.0e+04| 9.874058e+03| 0:0:00|5.9e+03|9.5e-01|2.6e-02| ✓
chol 1 1
3|0.756|0.756|2.4e-02|1.4e-01|1.7e+04| 3.969896e+03| 0:0:00|2.4e+02|1.2e+00|1.1e-02| ✓
chol 1 1
4|0.876|0.876|3.4e-03|1.9e-02|2.1e+03| 5.784738e+02| 0:0:00|6.7e+00|1.4e+00|1.8e-03| ✓
chol 1 1

```

```

5|1.000|1.000|1.4e-03|7.7e-03|1.1e+03| 3.023698e+02| 0:0:00|3.6e+00|1.3e+00|6.9e-04| ✓
chol 1 1
6|1.000|1.000|5.4e-04|3.3e-03|4.4e+02| 9.283126e+01| 0:0:00|1.7e+00|1.3e+00|2.7e-04| ✓
chol 1 1
7|1.000|1.000|3.4e-04|2.0e-03|2.7e+02| 4.240046e+01| 0:0:00|7.2e-01|1.3e+00|1.7e-04| ✓
chol 1 1
8|1.000|1.000|1.2e-04|7.5e-04|9.5e+01|-1.386959e+01| 0:0:00|4.2e-01|1.3e+00|6.1e-05| ✓
chol 1 1
9|1.000|1.000|5.9e-05|3.8e-04|4.6e+01|-2.834811e+01| 0:0:00|1.4e-01|1.4e+00|3.1e-05| ✓
chol 1 1
10|1.000|1.000|1.8e-05|1.5e-04|1.3e+01|-3.873419e+01| 0:0:00|7.0e-02|1.5e+00|9.7e-06| ✓
chol 1 1
11|1.000|1.000|7.8e-06|1.0e-04|5.3e+00|-4.090644e+01| 0:0:00|1.8e-02|1.6e+00|4.6e-06| ✓
chol 1 1
12|1.000|1.000|3.3e-06|8.0e-05|2.1e+00|-4.194236e+01| 0:0:00|8.6e-03|1.7e+00|2.1e-06| ✓
chol 1 1
13|1.000|1.000|1.4e-06|6.9e-05|8.5e-01|-4.232438e+01| 0:0:00|3.6e-03|1.8e+00|9.7e-07| ✓
chol 1 1
14|1.000|1.000|4.8e-07|6.1e-05|2.7e-01|-4.252859e+01| 0:0:00|1.6e-03|1.9e+00|3.4e-07| ✓
chol 1 1
15|1.000|1.000|1.5e-07|2.5e-05|8.1e-02|-4.259217e+01| 0:0:00|5.8e-04|1.9e+00|1.1e-07| ✓
chol 1 1
16|1.000|1.000|5.4e-08|1.0e-05|2.9e-02|-4.261006e+01| 0:0:00|1.8e-04|1.9e+00|3.9e-08| ✓
chol 1 1
17|1.000|1.000|1.7e-08|4.0e-06|9.4e-03|-4.261700e+01| 0:0:00|6.7e-05|1.9e+00|1.3e-08| ✓
chol 1 1
18|1.000|1.000|5.4e-09|1.6e-06|2.9e-03|-4.261942e+01| 0:0:00|2.2e-05|1.9e+00|4.0e-09| ✓
chol 1 1
19|1.000|1.000|1.7e-09|6.6e-07|9.2e-04|-4.262014e+01| 0:0:00|6.7e-06|2.0e+00|1.3e-09| ✓
chol 1 1
20|1.000|1.000|4.2e-10|2.6e-07|1.9e-04|-4.262044e+01| 0:0:00|2.2e-06|2.0e+00|2.6e-10| ✓
chol 1 1
21|1.000|1.000|3.0e-10|1.0e-07|7.5e-05|-4.262048e+01| 0:0:00|4.5e-07|2.0e+00|1.0e-10| ✓
chol 1 1
22|1.000|1.000|4.5e-10|4.2e-08|1.6e-05|-4.262051e+01| 0:0:00|1.8e-07|2.0e+00|2.2e-11| ✓
chol 1 1
23|1.000|1.000|4.1e-09|4.2e-08|2.5e-06|-4.262051e+01| 0:0:00|3.7e-08|2.0e+00|2.0e-12|
Stop: max(relative gap,infeasibilities) < 1.00e-07

```

```

-----
number of iterations    = 23
primal objective value = -4.26205138e+01
dual   objective value = -4.26205152e+01
gap := trace(XZ)       = 2.51e-06
relative gap           = 5.75e-08
actual relative gap    = 1.71e-08
rel. primal infeas     = 4.14e-09
rel. dual   infeas     = 4.19e-08
norm(X), norm(y), norm(Z) = 7.1e+00, 6.9e+01, 2.4e+01
norm(A), norm(b), norm(C) = 8.0e+02, 2.2e+00, 7.6e+01
Total CPU time (secs)   = 0.22
CPU time per iteration = 0.01
termination code        = 0
DIMACS errors: 4.1e-09  0.0e+00  4.2e-08  0.0e+00  1.7e-08  2.9e-08
-----

```

ans =

42.6205

Iteration 2 Total error is: 0.026563

num. of constraints = 25
dim. of socp var = 26, num. of socp blk = 1
dim. of linear var = 800
2 linear variables from unrestricted variable.

```
*** 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|2.1e+00|1.5e+01|1.9e+06| 1.639187e+04| 0:0:00|1.9e+06|1.0e+00|1.0e+00| ✓
chol 1 1
1|0.951|0.951|1.0e-01|7.3e-01|1.1e+05| 1.496272e+04| 0:0:00|3.2e+04|1.0e+00|5.1e-02| ✓
chol 1 1
2|0.424|0.424|9.1e-02|6.4e-01|1.2e+05| 1.608178e+04| 0:0:00|2.2e+04|9.3e-01|4.0e-02| ✓
chol 1 1
3|0.988|0.988|5.0e-02|3.5e-01|8.9e+04| 1.448011e+04| 0:0:00|2.5e+03|8.4e-01|2.0e-02| ✓
chol 1 1
4|0.854|0.854|2.5e-02|1.8e-01|4.5e+04| 9.346066e+03| 0:0:00|2.1e+02|9.2e-01|1.1e-02| ✓
chol 1 1
5|0.924|0.924|4.7e-03|3.3e-02|6.9e+03| 1.865389e+03| 0:0:00|7.8e+00|1.2e+00|2.6e-03| ✓
chol 1 1
6|1.000|1.000|1.9e-03|1.4e-02|2.8e+03| 7.765918e+02| 0:0:00|9.4e+00|1.2e+00|1.1e-03| ✓
chol 1 1
7|1.000|1.000|7.3e-04|5.1e-03|1.0e+03| 2.598183e+02| 0:0:00|3.8e+00|1.3e+00|4.3e-04| ✓
chol 1 1
8|1.000|1.000|3.7e-04|2.7e-03|5.2e+02| 1.078855e+02| 0:0:00|1.5e+00|1.3e+00|2.2e-04| ✓
chol 1 1
9|1.000|1.000|1.5e-04|1.2e-03|2.1e+02| 1.998416e+01| 0:0:00|7.6e-01|1.3e+00|9.5e-05| ✓
chol 1 1
10|1.000|1.000|6.8e-05|5.2e-04|9.1e+01|-1.588384e+01| 0:0:00|3.2e-01|1.3e+00|4.3e-05| ✓
chol 1 1
11|1.000|1.000|2.7e-05|2.3e-04|3.5e+01|-3.183034e+01| 0:0:00|1.4e-01|1.4e+00|1.8e-05| ✓
chol 1 1
12|1.000|1.000|9.9e-06|1.1e-04|1.2e+01|-3.873383e+01| 0:0:00|5.2e-02|1.5e+00|6.8e-06| ✓
chol 1 1
13|1.000|1.000|3.9e-06|7.7e-05|4.4e+00|-4.097923e+01| 0:0:00|1.8e-02|1.6e+00|2.9e-06| ✓
chol 1 1
14|1.000|1.000|1.5e-06|6.4e-05|1.6e+00|-4.181880e+01| 0:0:00|6.9e-03|1.7e+00|1.2e-06| ✓
chol 1 1
15|1.000|1.000|5.9e-07|5.6e-05|5.8e-01|-4.214379e+01| 0:0:00|2.8e-03|1.8e+00|5.0e-07| ✓
chol 1 1
16|1.000|1.000|1.7e-07|5.0e-05|1.6e-01|-4.228205e+01| 0:0:00|1.1e-03|1.9e+00|1.6e-07| ✓
```

```

chol 1 1
17|1.000|1.000|4.6e-08|2.0e-05|4.2e-02|-4.232264e+01| 0:0:00|3.6e-04|1.9e+00|4.1e-08| ✓
chol 1 1
18|1.000|1.000|1.7e-08|8.0e-06|1.6e-02|-4.233149e+01| 0:0:00|9.5e-05|1.9e+00|1.6e-08| ✓
chol 1 1
19|1.000|1.000|4.1e-09|3.3e-06|3.7e-03|-4.233577e+01| 0:0:00|3.6e-05|2.0e+00|3.8e-09| ✓
chol 1 1
20|1.000|1.000|8.6e-10|1.3e-06|7.6e-04|-4.233687e+01| 0:0:00|8.7e-06|2.0e+00|7.8e-10| ✓
chol 1 1
21|1.000|1.000|2.7e-10|5.2e-07|1.8e-04|-4.233708e+01| 0:0:00|1.8e-06|2.0e+00|1.9e-10| ✓
chol 1 1
22|1.000|1.000|3.0e-10|2.1e-07|3.3e-05|-4.233714e+01| 0:0:00|4.3e-07|2.0e+00|3.4e-11| ✓
chol 1 1
23|1.000|1.000|2.7e-09|2.1e-07|4.4e-06|-4.233715e+01| 0:0:00|7.9e-08|2.0e+00|3.7e-12| ✓
chol 1 1
24|1.000|1.000|3.5e-09|2.1e-07|1.7e-07|-4.233716e+01| 0:0:00|1.1e-08|2.0e+00|0.0e+00|
  Stop: relative gap < infeasibility
-----
number of iterations      = 24
primal objective value = -4.23371524e+01
dual   objective value = -4.23371555e+01
gap := trace(XZ)         = 4.44e-06
relative gap              = 1.03e-07
actual relative gap       = 3.59e-08
rel. primal infeas        = 2.70e-09
rel. dual   infeas        = 2.08e-07
norm(X), norm(y), norm(Z) = 7.3e+00, 6.9e+01, 2.5e+01
norm(A), norm(b), norm(C) = 8.0e+02, 3.8e+00, 7.6e+01
Total CPU time (secs)    = 0.22
CPU time per iteration   = 0.01
termination code         = -1
DIMACS errors: 2.7e-09  0.0e+00  2.1e-07  0.0e+00  3.6e-08  5.2e-08
-----

ans =

    42.3372

Iteration    3    Total error is: 0.026478

num. of constraints = 25
dim. of socp var   = 26,   num. of socp blk   = 1
dim. of linear var = 800
2 linear variables from unrestricted variable.

*** 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|2.2e+00|1.5e+01|1.8e+06| 1.537914e+04| 0:0:00|1.8e+06|1.0e+00|1.0e+00| ✓
chol 1 1
1|0.936|0.936|1.4e-01|9.5e-01|1.3e+05| 1.405999e+04| 0:0:00|5.8e+04|1.0e+00|6.6e-02| ✓
chol 1 1
2|0.368|0.368|1.4e-01|9.2e-01|1.6e+05| 1.657183e+04| 0:0:00|4.5e+04|9.0e-01|5.6e-02| ✓
chol 1 1
3|0.940|0.940|1.0e-01|6.8e-01|1.9e+05| 2.049279e+04| 0:0:00|1.2e+04|7.1e-01|3.3e-02| ✓
chol 1 1
4|0.721|0.721|6.2e-02|4.2e-01|1.1e+05| 1.533119e+04| 0:0:00|2.6e+03|7.7e-01|2.1e-02| ✓
chol 1 1
5|0.772|0.772|2.6e-02|1.8e-01|4.0e+04| 7.941523e+03| 0:0:00|1.3e+02|9.3e-01|1.1e-02| ✓
chol 1 1
6|0.895|0.895|3.0e-03|2.0e-02|3.5e+03| 8.496925e+02| 0:0:00|1.6e+01|1.2e+00|1.6e-03| ✓
chol 1 1
7|1.000|1.000|1.9e-03|1.3e-02|2.6e+03| 6.717326e+02| 0:0:00|5.2e+00|1.2e+00|1.0e-03| ✓
chol 1 1
8|1.000|1.000|7.1e-04|4.7e-03|9.0e+02| 2.162109e+02| 0:0:00|3.6e+00|1.2e+00|3.9e-04| ✓
chol 1 1
9|1.000|1.000|3.5e-04|2.5e-03|4.4e+02| 8.084683e+01| 0:0:00|1.3e+00|1.3e+00|2.0e-04| ✓
chol 1 1
10|1.000|1.000|1.6e-04|1.1e-03|2.0e+02| 1.522462e+01| 0:0:00|6.6e-01|1.3e+00|9.3e-05| ✓
chol 1 1
11|1.000|1.000|6.2e-05|4.6e-04|7.5e+01|-2.123192e+01| 0:0:00|2.9e-01|1.3e+00|3.7e-05| ✓
chol 1 1
12|1.000|1.000|2.7e-05|2.1e-04|3.2e+01|-3.297762e+01| 0:0:00|1.1e-01|1.4e+00|1.7e-05| ✓
chol 1 1
13|1.000|1.000|9.4e-06|1.0e-04|1.0e+01|-3.916448e+01| 0:0:00|4.7e-02|1.4e+00|6.1e-06| ✓
chol 1 1
14|1.000|1.000|3.9e-06|7.0e-05|4.1e+00|-4.095057e+01| 0:0:00|1.5e-02|1.5e+00|2.7e-06| ✓
chol 1 1
15|1.000|1.000|1.3e-06|5.7e-05|1.2e+00|-4.182155e+01| 0:0:00|6.2e-03|1.7e+00|9.8e-07| ✓
chol 1 1
16|1.000|1.000|5.1e-07|5.0e-05|4.5e-01|-4.205218e+01| 0:0:00|2.0e-03|1.8e+00|4.2e-07| ✓
chol 1 1
17|1.000|1.000|1.2e-07|4.5e-05|9.6e-02|-4.217265e+01| 0:0:00|8.8e-04|1.9e+00|1.0e-07| ✓
chol 1 1
18|1.000|1.000|3.3e-08|1.8e-05|2.7e-02|-4.219600e+01| 0:0:00|2.1e-04|1.9e+00|2.9e-08| ✓
chol 1 1
19|1.000|1.000|7.0e-09|7.2e-06|5.6e-03|-4.220370e+01| 0:0:00|6.2e-05|1.9e+00|6.1e-09| ✓
chol 1 1
20|1.000|1.000|2.7e-09|2.9e-06|2.1e-03|-4.220483e+01| 0:0:00|1.3e-05|2.0e+00|2.3e-09| ✓
chol 1 1
21|0.938|0.938|4.5e-10|1.3e-06|3.1e-04|-4.220555e+01| 0:0:00|5.5e-06|2.0e+00|3.5e-10| ✓
chol 1 1
22|1.000|1.000|4.4e-10|4.6e-07|5.9e-05|-4.220564e+01| 0:0:00|7.4e-07|2.0e+00|6.4e-11| ✓
chol 1 1
23|1.000|1.000|3.6e-09|4.6e-07|3.4e-05|-4.220565e+01| 0:0:00|1.4e-07|2.0e+00|3.6e-11| ✓
chol 1 1
24|1.000|1.000|7.3e-10|4.6e-07|9.0e-06|-4.220566e+01| 0:0:00|8.0e-08|2.0e+00|9.7e-12| ✓
chol 1 1
25|1.000|1.000|1.2e-09|4.6e-07|2.5e-06|-4.220566e+01| 0:0:00|2.2e-08|2.0e+00|2.3e-12| ✓
chol 1 1
26|1.000|1.000|1.8e-09|4.6e-07|7.1e-07|-4.220566e+01| 0:0:00|6.0e-09|2.0e+00|1.5e-13| ✓
chol 1 1

```

```
27|1.000|1.000|2.8e-09|4.6e-07|1.9e-07|-4.220566e+01| 0:0:00|1.7e-09|2.0e+00|0.0e+00|
lack of progress in infeas
```

```
-----
number of iterations    = 27
primal objective value = -4.22056533e+01
dual   objective value = -4.22056596e+01
gap := trace(XZ)       = 9.03e-06
relative gap           = 2.09e-07
actual relative gap    = 7.43e-08
rel. primal infeas     = 7.26e-10
rel. dual   infeas     = 4.62e-07
norm(X), norm(y), norm(Z) = 7.5e+00, 6.9e+01, 2.5e+01
norm(A), norm(b), norm(C) = 8.0e+02, 3.7e+00, 7.6e+01
Total CPU time (secs)   = 0.19
CPU time per iteration = 0.01
termination code        = -9
DIMACS errors: 7.3e-10  0.0e+00  4.6e-07  0.0e+00  7.4e-08  1.1e-07
-----
```

```
ans =
```

```
42.2057
```

```
Iteration    4    Total error is: 0.02643
```

```
num. of constraints = 25
dim. of socp var   = 26,   num. of socp blk = 1
dim. of linear var = 800
2 linear variables from unrestricted variable.
```

```
*** 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|2.3e+00|1.5e+01|1.7e+06| 1.493544e+04| 0:0:00|1.7e+06|1.0e+00|1.0e+00| ✓
chol 1 1
1|0.931|0.931|1.6e-01|1.0e+00|1.4e+05| 1.367758e+04| 0:0:00|6.6e+04|1.0e+00|7.1e-02| ✓
chol 1 1
2|0.367|0.367|1.5e-01|9.9e-01|1.7e+05| 1.624635e+04| 0:0:00|5.0e+04|9.0e-01|6.0e-02| ✓
chol 1 1
3|1.000|1.000|1.0e-01|6.5e-01|1.7e+05| 1.921678e+04| 0:0:00|9.9e+03|7.3e-01|3.2e-02| ✓
chol 1 1
4|0.791|0.791|4.9e-02|3.1e-01|7.2e+04| 1.162317e+04| 0:0:00|5.8e+02|8.5e-01|1.8e-02| ✓
chol 1 1
5|0.749|0.749|1.3e-02|8.0e-02|1.4e+04| 3.254028e+03| 0:0:00|2.0e+01|1.1e+00|6.0e-03| ✓
chol 1 1
6|0.825|0.825|2.9e-03|1.8e-02|3.0e+03| 7.575944e+02| 0:0:00|1.7e+01|1.2e+00|1.5e-03| ✓
chol 1 1
```

```
7|0.999|0.999|2.0e-03|1.3e-02|2.5e+03| 6.385826e+02| 0:0:00|5.0e+00|1.2e+00|1.0e-03| ✓  
chol 1 1  
8|1.000|1.000|1.2e-03|7.8e-03|1.5e+03| 3.798336e+02| 0:0:00|3.6e+00|1.2e+00|6.4e-04| ✓  
chol 1 1  
9|0.959|0.959|3.9e-04|2.7e-03|4.7e+02| 8.554970e+01| 0:0:00|2.1e+00|1.3e+00|2.1e-04| ✓  
chol 1 1  
10|1.000|1.000|2.5e-04|1.7e-03|2.9e+02| 3.982177e+01| 0:0:00|6.8e-01|1.3e+00|1.4e-04| ✓  
chol 1 1  
11|1.000|1.000|8.0e-05|5.7e-04|9.2e+01|-1.670786e+01| 0:0:00|4.3e-01|1.3e+00|4.5e-05| ✓  
chol 1 1  
12|1.000|1.000|3.9e-05|2.8e-04|4.3e+01|-2.980371e+01| 0:0:00|1.3e-01|1.4e+00|2.3e-05| ✓  
chol 1 1  
13|1.000|1.000|1.2e-05|1.2e-04|1.3e+01|-3.838837e+01| 0:0:00|6.4e-02|1.4e+00|7.6e-06| ✓  
chol 1 1  
14|1.000|1.000|5.3e-06|7.5e-05|5.2e+00|-4.055165e+01| 0:0:00|1.8e-02|1.5e+00|3.5e-06| ✓  
chol 1 1  
15|1.000|1.000|1.7e-06|5.8e-05|1.5e+00|-4.166579e+01| 0:0:00|8.0e-03|1.6e+00|1.2e-06| ✓  
chol 1 1  
16|1.000|1.000|6.9e-07|5.0e-05|5.7e-01|-4.195298e+01| 0:0:00|2.4e-03|1.8e+00|5.3e-07| ✓  
chol 1 1  
17|1.000|1.000|1.6e-07|4.5e-05|1.3e-01|-4.210240e+01| 0:0:00|1.1e-03|1.9e+00|1.3e-07| ✓  
chol 1 1  
18|1.000|1.000|4.3e-08|1.8e-05|3.3e-02|-4.213401e+01| 0:0:00|2.7e-04|1.9e+00|3.6e-08| ✓  
chol 1 1  
19|1.000|1.000|9.8e-09|7.2e-06|7.4e-03|-4.214299e+01| 0:0:00|7.4e-05|1.9e+00|8.2e-09| ✓  
chol 1 1  
20|1.000|1.000|2.7e-09|2.9e-06|2.0e-03|-4.214483e+01| 0:0:00|1.7e-05|2.0e+00|2.3e-09| ✓  
chol 1 1  
21|0.719|0.719|1.7e-09|1.6e-06|1.3e-03|-4.214512e+01| 0:0:00|8.3e-06|2.0e+00|1.4e-09| ✓  
chol 1 1  
22|0.639|0.639|9.7e-10|8.9e-07|8.3e-04|-4.214531e+01| 0:0:00|4.9e-06|1.9e+00|9.2e-10| ✓  
chol 1 1  
23|0.238|0.238|6.1e-10|7.2e-07|7.7e-04|-4.214535e+01| 0:0:00|4.2e-06|1.9e+00|8.3e-10| ✓  
chol 1 1  
24|0.311|0.311|1.3e-09|5.0e-07|7.2e-04|-4.214539e+01| 0:0:00|3.5e-06|1.9e+00|7.3e-10| ✓  
chol 1 1  
25|0.397|0.397|1.8e-09|3.0e-07|6.2e-04|-4.214545e+01| 0:0:00|2.8e-06|1.9e+00|6.1e-10| ✓  
chol 1 1  
26|0.552|0.552|2.2e-09|1.4e-07|4.8e-04|-4.214552e+01| 0:0:00|2.1e-06|1.9e+00|4.6e-10| ✓  
chol 1 1  
27|0.127|0.127|4.0e-09|1.2e-07|4.7e-04|-4.214554e+01| 0:0:00|2.0e-06|1.9e+00|4.4e-10| ✓  
chol 1 1  
28|0.261|0.261|6.3e-09|9.1e-08|4.5e-04|-4.214557e+01| 0:0:00|1.8e-06|1.9e+00|4.0e-10| ✓  
chol 1 1  
29|0.705|0.705|6.5e-09|2.8e-08|3.2e-04|-4.214565e+01| 0:0:00|1.3e-06|1.9e+00|2.8e-10| ✓  
chol 1 1  
30|0.216|0.216|1.8e-08|2.3e-08|3.2e-04|-4.214567e+01| 0:0:00|1.2e-06|1.8e+00|2.6e-10| ✓  
chol 1 1  
31|0.486|0.486|2.0e-08|1.3e-08|2.8e-04|-4.214571e+01| 0:0:00|9.8e-07|1.8e+00|2.2e-10| ✓  
chol 1 1  
32|0.805|0.805|1.4e-08|3.8e-09|1.7e-04|-4.214577e+01| 0:0:00|7.0e-07|1.7e+00|1.3e-10| ✓  
chol 1 1  
33|0.620|0.620|2.8e-08|2.5e-09|1.4e-04|-4.214579e+01| 0:0:00|5.1e-07|1.7e+00|1.0e-10| ✓  
chol 1 1  
34|0.711|0.711|6.7e-08|1.3e-09|1.1e-04|-4.214580e+01| 0:0:00|3.7e-07|1.6e+00|8.8e-11| ✓
```



```

chol 1 1
35|0.174|0.174|1.1e-07|1.3e-09|1.1e-04|-4.214580e+01| 0:0:00|3.6e-07|1.6e+00|9.5e-11| ✓
chol 1 1
36|0.224|0.224|1.3e-07|1.2e-09|1.1e-04|-4.214580e+01| 0:0:00|3.3e-07|1.5e+00|9.4e-11|
  Stop: progress is too slow
-----
number of iterations    = 36
primal objective value = -4.21457537e+01
dual   objective value = -4.21458482e+01
gap := trace(XZ)       = 1.07e-04
relative gap           = 2.48e-06
actual relative gap    = 1.11e-06
rel. primal infeas     = 1.32e-07
rel. dual   infeas     = 1.23e-09
norm(X), norm(y), norm(Z) = 9.3e+03, 6.9e+01, 2.5e+01
norm(A), norm(b), norm(C) = 8.0e+02, 3.6e+00, 7.6e+01
Total CPU time (secs)   = 0.34
CPU time per iteration = 0.01
termination code        = -5
DIMACS errors: 1.3e-07  0.0e+00  1.2e-09  0.0e+00  1.1e-06  1.3e-06
-----

ans =

    42.1458

Iteration    5    Total error is: 0.026408

num. of constraints = 25
dim. of socp var   = 26,    num. of socp blk   = 1
dim. of linear var = 800
2 linear variables from unrestricted variable.

*** 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|2.2e+00|1.5e+01|1.9e+06| 1.631398e+04| 0:0:00|1.9e+06|1.0e+00|1.0e+00| ✓
chol 1 1
1|0.919|0.919|1.8e-01|1.2e+00|1.7e+05| 1.494531e+04| 0:0:00|9.5e+04|1.0e+00|8.3e-02| ✓
chol 1 1
2|0.346|0.346|1.8e-01|1.2e+00|2.2e+05| 1.850339e+04| 0:0:00|7.6e+04|8.9e-01|7.2e-02| ✓
chol 1 1
3|1.000|1.000|1.4e-01|9.6e-01|3.1e+05| 2.714725e+04| 0:0:00|2.1e+04|6.4e-01|4.1e-02| ✓
chol 1 1
4|0.778|0.778|7.2e-02|4.9e-01|1.4e+05| 1.737969e+04| 0:0:00|1.3e+03|7.5e-01|2.5e-02| ✓
chol 1 1
5|0.719|0.719|2.4e-02|1.6e-01|3.6e+04| 7.050661e+03| 0:0:00|5.3e+01|9.8e-01|1.1e-02| ✓

```

```

chol 1 1
 6|0.873|0.873|3.3e-03|2.3e-02|4.0e+03| 9.552040e+02| 0:0:00|3.1e+01|1.2e+00|1.9e-03| ✓
chol 1 1
 7|1.000|1.000|2.1e-03|1.4e-02|3.0e+03| 7.924780e+02| 0:0:00|6.5e+00|1.2e+00|1.1e-03| ✓
chol 1 1
 8|1.000|1.000|8.2e-04|5.6e-03|1.1e+03| 2.833129e+02| 0:0:00|4.2e+00|1.2e+00|4.6e-04| ✓
chol 1 1
 9|1.000|1.000|4.1e-04|2.9e-03|5.7e+02| 1.131611e+02| 0:0:00|1.6e+00|1.3e+00|2.3e-04| ✓
chol 1 1
10|1.000|1.000|1.8e-04|1.3e-03|2.5e+02| 2.745950e+01| 0:0:00|8.3e-01|1.3e+00|1.1e-04| ✓
chol 1 1
11|1.000|1.000|7.4e-05|5.5e-04|9.8e+01|-1.498886e+01| 0:0:00|3.6e-01|1.3e+00|4.4e-05| ✓
chol 1 1
12|1.000|1.000|3.0e-05|2.4e-04|3.9e+01|-3.095386e+01| 0:0:00|1.4e-01|1.4e+00|1.9e-05| ✓
chol 1 1
13|1.000|1.000|1.0e-05|1.1e-04|1.3e+01|-3.848431e+01| 0:0:00|5.6e-02|1.4e+00|6.7e-06| ✓
chol 1 1
14|1.000|1.000|4.2e-06|7.2e-05|4.7e+00|-4.066048e+01| 0:0:00|1.8e-02|1.5e+00|2.9e-06| ✓
chol 1 1
15|1.000|1.000|1.3e-06|5.7e-05|1.4e+00|-4.168762e+01| 0:0:00|7.1e-03|1.7e+00|1.0e-06| ✓
chol 1 1
16|1.000|1.000|5.2e-07|5.0e-05|4.9e-01|-4.194737e+01| 0:0:00|2.2e-03|1.8e+00|4.3e-07| ✓
chol 1 1
17|1.000|1.000|1.1e-07|4.5e-05|9.7e-02|-4.208480e+01| 0:0:00|9.6e-04|1.9e+00|9.5e-08| ✓
chol 1 1
18|1.000|1.000|3.0e-08|1.8e-05|2.6e-02|-4.210877e+01| 0:0:00|2.1e-04|1.9e+00|2.6e-08| ✓
chol 1 1
19|0.978|0.978|6.2e-09|7.5e-06|5.4e-03|-4.211627e+01| 0:0:00|6.3e-05|2.0e+00|5.5e-09| ✓
chol 1 1
20|1.000|1.000|1.8e-09|2.9e-06|1.5e-03|-4.211758e+01| 0:0:00|1.3e-05|2.0e+00|1.6e-09| ✓
chol 1 1
21|0.403|0.403|1.5e-09|2.2e-06|1.3e-03|-4.211768e+01| 0:0:00|9.0e-06|2.0e+00|1.3e-09| ✓
chol 1 1
22|0.573|0.573|9.4e-10|1.2e-06|8.8e-04|-4.211785e+01| 0:0:00|5.6e-06|2.0e+00|8.8e-10| ✓
chol 1 1
23|0.453|0.453|3.5e-10|7.4e-07|7.2e-04|-4.211793e+01| 0:0:00|4.0e-06|1.9e+00|7.0e-10| ✓
chol 1 1
24|0.162|0.162|1.6e-09|6.4e-07|7.0e-04|-4.211795e+01| 0:0:00|3.6e-06|1.9e+00|6.6e-10| ✓
chol 1 1
25|0.306|0.306|1.8e-09|4.4e-07|6.5e-04|-4.211799e+01| 0:0:00|3.0e-06|1.9e+00|5.9e-10| ✓
chol 1 1
26|0.482|0.482|2.1e-09|2.3e-07|5.3e-04|-4.211805e+01| 0:0:00|2.3e-06|1.9e+00|4.7e-10| ✓
chol 1 1
27|0.509|0.509|3.5e-09|1.1e-07|4.4e-04|-4.211811e+01| 0:0:00|1.8e-06|1.9e+00|3.8e-10| ✓
chol 1 1
28|0.066|0.066|6.3e-09|1.1e-07|4.4e-04|-4.211812e+01| 0:0:00|1.7e-06|1.9e+00|3.7e-10|
  Stop: progress is too slow
-----
number of iterations    = 28
primal objective value = -4.21179462e+01
dual   objective value = -4.21182900e+01
gap := trace(XZ)       = 4.37e-04
relative gap           = 1.01e-05
actual relative gap    = 4.03e-06
rel. primal infeas     = 6.34e-09

```

```

rel. dual   infeas      = 1.08e-07
norm(X), norm(y), norm(Z) = 3.9e+02, 6.9e+01, 2.5e+01
norm(A), norm(b), norm(C) = 8.0e+02, 4.1e+00, 7.6e+01
Total CPU time (secs) = 0.27
CPU time per iteration = 0.01
termination code      = -5
DIMACS errors: 6.3e-09  0.0e+00  1.1e-07  0.0e+00  4.0e-06  5.1e-06
-----

```

```
ans =
```

```
42.1183
```

```
Iteration    6    Total error is: 0.026397
```

```

num. of constraints = 25
dim. of socp var   = 26,   num. of socp blk = 1
dim. of linear var = 800
2 linear variables from unrestricted variable.

```

```
*** 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|2.2e+00|1.5e+01|1.9e+06| 1.659741e+04| 0:0:00|1.9e+06|1.0e+00|1.0e+00| ✓
```

```
chol 1 1
```

```
1|0.917|0.917|1.8e-01|1.2e+00|1.7e+05| 1.520795e+04| 0:0:00|9.9e+04|1.0e+00|8.4e-02| ✓
```

```
chol 1 1
```

```
2|0.353|0.353|1.8e-01|1.2e+00|2.3e+05| 1.897488e+04| 0:0:00|7.9e+04|8.8e-01|7.3e-02| ✓
```

```
chol 1 1
```

```
3|1.000|1.000|1.5e-01|1.0e+00|3.3e+05| 2.831830e+04| 0:0:00|2.3e+04|6.3e-01|4.2e-02| ✓
```

```
chol 1 1
```

```
4|0.778|0.778|7.5e-02|5.1e-01|1.5e+05| 1.827819e+04| 0:0:00|1.4e+03|7.4e-01|2.5e-02| ✓
```

```
chol 1 1
```

```
5|0.718|0.718|2.6e-02|1.7e-01|3.9e+04| 7.617786e+03| 0:0:00|5.8e+01|9.7e-01|1.1e-02| ✓
```

```
chol 1 1
```

```
6|0.886|0.886|3.2e-03|2.2e-02|4.0e+03| 9.536109e+02| 0:0:00|3.2e+01|1.2e+00|1.8e-03| ✓
```

```
chol 1 1
```

```
7|1.000|1.000|2.1e-03|1.4e-02|3.0e+03| 7.917344e+02| 0:0:00|6.5e+00|1.2e+00|1.1e-03| ✓
```

```
chol 1 1
```

```
8|1.000|1.000|7.8e-04|5.3e-03|1.1e+03| 2.706025e+02| 0:0:00|4.2e+00|1.2e+00|4.4e-04| ✓
```

```
chol 1 1
```

```
9|1.000|1.000|4.0e-04|2.9e-03|5.6e+02| 1.125263e+02| 0:0:00|1.6e+00|1.3e+00|2.3e-04| ✓
```

```
chol 1 1
```

```
10|1.000|1.000|1.8e-04|1.3e-03|2.5e+02| 2.777800e+01| 0:0:00|8.3e-01|1.3e+00|1.0e-04| ✓
```

```
chol 1 1
```

```
11|1.000|1.000|7.2e-05|5.4e-04|9.8e+01|-1.498098e+01| 0:0:00|3.6e-01|1.3e+00|4.4e-05| ✓
```

```
chol 1 1
```

```

12|1.000|1.000|3.0e-05|2.4e-04|3.9e+01|-3.083204e+01| 0:0:00|1.4e-01|1.4e+00|1.9e-05| ✓
chol 1 1
13|1.000|1.000|1.0e-05|1.1e-04|1.3e+01|-3.845347e+01| 0:0:00|5.7e-02|1.4e+00|6.6e-06| ✓
chol 1 1
14|1.000|1.000|4.1e-06|7.1e-05|4.7e+00|-4.061797e+01| 0:0:00|1.7e-02|1.5e+00|2.9e-06| ✓
chol 1 1
15|1.000|1.000|1.3e-06|5.7e-05|1.4e+00|-4.165519e+01| 0:0:00|7.1e-03|1.7e+00|1.0e-06| ✓
chol 1 1
16|1.000|1.000|5.2e-07|5.0e-05|5.0e+01|-4.191383e+01| 0:0:00|2.2e-03|1.8e+00|4.3e-07| ✓
chol 1 1
17|1.000|1.000|1.1e-07|4.5e-05|9.7e-02|-4.205236e+01| 0:0:00|9.7e-04|1.9e+00|9.4e-08| ✓
chol 1 1
18|1.000|1.000|3.0e-08|1.8e-05|2.7e-02|-4.207601e+01| 0:0:00|2.1e-04|1.9e+00|2.7e-08| ✓
chol 1 1
19|0.978|0.978|6.2e-09|7.5e-06|5.5e-03|-4.208385e+01| 0:0:00|6.6e-05|2.0e+00|5.6e-09| ✓
chol 1 1
20|0.967|0.967|1.8e-09|3.0e-06|1.6e-03|-4.208520e+01| 0:0:00|1.5e-05|2.0e+00|1.6e-09| ✓
chol 1 1
21|0.312|0.312|1.5e-09|2.5e-06|1.4e-03|-4.208527e+01| 0:0:00|1.1e-05|2.0e+00|1.4e-09| ✓
chol 1 1
22|0.380|0.380|1.2e-09|1.6e-06|1.1e-03|-4.208539e+01| 0:0:00|8.2e-06|2.0e+00|1.1e-09| ✓
chol 1 1
23|0.592|0.592|7.0e-10|7.1e-07|7.8e-04|-4.208554e+01| 0:0:00|4.9e-06|1.9e+00|7.3e-10| ✓
chol 1 1
24|0.341|0.341|6.7e-10|4.8e-07|6.8e-04|-4.208560e+01| 0:0:00|3.9e-06|1.9e+00|6.2e-10| ✓
chol 1 1
25|0.300|0.300|1.6e-09|3.4e-07|6.2e-04|-4.208564e+01| 0:0:00|3.2e-06|1.9e+00|5.5e-10| ✓
chol 1 1
26|0.578|0.578|1.7e-09|1.5e-07|4.6e-04|-4.208573e+01| 0:0:00|2.2e-06|1.9e+00|4.1e-10| ✓
chol 1 1
27|0.094|0.094|2.9e-09|1.4e-07|4.6e-04|-4.208574e+01| 0:0:00|2.1e-06|1.9e+00|3.9e-10| ✓
chol 1 1
28|0.559|0.559|5.4e-09|6.2e-08|3.7e-04|-4.208580e+01| 0:0:00|1.6e-06|1.9e+00|3.1e-10| ✓
chol 1 1
29|0.143|0.143|7.5e-09|5.3e-08|3.7e-04|-4.208581e+01| 0:0:00|1.5e-06|1.9e+00|3.0e-10| ✓
chol 1 1
30|0.351|0.351|1.1e-08|3.6e-08|3.5e-04|-4.208585e+01| 0:0:00|1.3e-06|1.9e+00|2.6e-10| ✓
chol 1 1
31|0.632|0.632|1.3e-08|1.4e-08|2.6e-04|-4.208591e+01| 0:0:00|1.0e-06|1.8e+00|1.9e-10| ✓
chol 1 1
32|0.599|0.599|2.0e-08|6.8e-09|2.2e-04|-4.208595e+01| 0:0:00|7.6e-07|1.8e+00|1.5e-10| ✓
chol 1 1
33|0.708|0.708|1.6e-08|2.3e-09|1.3e-04|-4.208599e+01| 0:0:00|5.6e-07|1.7e+00|9.4e-11| ✓
chol 1 1
34|0.182|0.182|5.9e-08|2.7e-09|1.5e-04|-4.208599e+01| 0:0:00|5.4e-07|1.6e+00|1.0e-10| ✓
chol 1 1
35|0.871|0.871|5.1e-08|8.2e-10|8.9e-05|-4.208603e+01| 0:0:00|3.6e-07|1.6e+00|6.6e-11| ✓
chol 1 1
    stop: primal infeas has deteriorated too much, 2.1e-07  0, 0, 1
36|0.537|0.537|5.1e-08|8.2e-10|8.9e-05|-4.208603e+01| 0:0:00|3.6e-07|1.6e+00|6.6e-11|
-----
number of iterations    = 36
primal objective value = -4.20859886e+01
dual  objective value = -4.20860633e+01
gap := trace(XZ)       = 8.87e-05

```

```

relative gap          = 2.06e-06
actual relative gap   = 8.78e-07
rel. primal infeas    = 5.13e-08
rel. dual   infeas    = 8.25e-10
norm(X), norm(y), norm(Z) = 7.1e+03, 6.9e+01, 2.5e+01
norm(A), norm(b), norm(C) = 8.0e+02, 4.3e+00, 7.6e+01
Total CPU time (secs) = 0.31
CPU time per iteration = 0.01
termination code       = -7
DIMACS errors: 5.1e-08  0.0e+00  8.2e-10  0.0e+00  8.8e-07  1.0e-06
-----

```

```
ans =
```

```
42.0861
```

```
Iteration    7    Total error is: 0.026386
```

```

num. of constraints = 25
dim. of socp var   = 26,   num. of socp blk = 1
dim. of linear var = 800
2 linear variables from unrestricted variable.

```

```

*** 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|1.9e+00|1.5e+01|2.2e+06| 1.932044e+04| 0:0:00|2.2e+06|1.0e+00|1.0e+00| ✓
chol 1 1
1|0.904|0.904|1.8e-01|1.4e+00|2.3e+05| 1.771229e+04| 0:0:00|1.5e+05|1.0e+00|9.8e-02| ✓
chol 1 1
2|0.325|0.325|1.9e-01|1.5e+00|3.2e+05| 2.256788e+04| 0:0:00|1.2e+05|8.8e-01|8.6e-02| ✓
chol 1 1
3|1.000|1.000|1.7e-01|1.3e+00|5.6e+05| 3.903082e+04| 0:0:00|4.2e+04|5.8e-01|5.2e-02| ✓
chol 1 1
4|0.762|0.762|8.8e-02|6.7e-01|2.4e+05| 2.546161e+04| 0:0:00|2.4e+03|6.9e-01|3.1e-02| ✓
chol 1 1
5|0.721|0.721|3.2e-02|2.5e-01|7.1e+04| 1.229817e+04| 0:0:00|1.1e+02|8.9e-01|1.5e-02| ✓
chol 1 1
6|1.000|1.000|2.4e-03|1.8e-02|4.4e+03| 1.133412e+03| 0:0:00|3.7e+01|1.2e+00|1.5e-03| ✓
chol 1 1
7|1.000|1.000|1.5e-03|1.2e-02|2.9e+03| 7.738477e+02| 0:0:00|6.7e+00|1.2e+00|9.6e-04| ✓
chol 1 1
8|1.000|1.000|8.4e-04|6.4e-03|1.5e+03| 3.956714e+02| 0:0:00|4.1e+00|1.2e+00|5.3e-04| ✓
chol 1 1
9|1.000|1.000|3.5e-04|2.8e-03|6.5e+02| 1.372664e+02| 0:0:00|2.2e+00|1.3e+00|2.3e-04| ✓
chol 1 1
10|1.000|1.000|1.5e-04|1.2e-03|2.7e+02| 3.368634e+01| 0:0:00|9.4e-01|1.3e+00|9.9e-05| ✓

```

```

chol 1 1
11|1.000|1.000|5.8e-05|4.9e-04|1.0e+02|-1.329969e+01| 0:0:00|4.0e-01|1.3e+00|3.9e-05| ✓
chol 1 1
12|1.000|1.000|2.2e-05|2.0e-04|3.7e+01|-3.140361e+01| 0:0:00|1.5e-01|1.4e+00|1.5e-05| ✓
chol 1 1
13|1.000|1.000|7.8e-06|9.9e-05|1.3e+01|-3.836564e+01| 0:0:00|5.3e-02|1.4e+00|5.8e-06| ✓
chol 1 1
14|1.000|1.000|2.8e-06|6.8e-05|4.1e+00|-4.078981e+01| 0:0:00|1.7e-02|1.6e+00|2.2e-06| ✓
chol 1 1
15|1.000|1.000|9.9e-07|5.7e-05|1.3e+00|-4.162299e+01| 0:0:00|6.1e-03|1.7e+00|8.7e-07| ✓
chol 1 1
16|1.000|1.000|3.0e-07|5.0e-05|3.6e-01|-4.192942e+01| 0:0:00|2.2e-03|1.8e+00|2.8e-07| ✓
chol 1 1
17|0.994|0.994|6.0e-08|2.0e-05|7.1e-02|-4.203007e+01| 0:0:00|7.6e-04|1.9e+00|5.8e-08| ✓
chol 1 1
18|1.000|1.000|2.6e-08|8.1e-06|3.1e-02|-4.204269e+01| 0:0:00|1.6e-04|1.9e+00|2.6e-08| ✓
chol 1 1
19|1.000|1.000|4.7e-09|3.3e-06|5.4e-03|-4.205213e+01| 0:0:00|7.0e-05|1.9e+00|4.7e-09| ✓
chol 1 1
20|0.967|0.967|1.2e-09|1.4e-06|1.4e-03|-4.205355e+01| 0:0:00|1.4e-05|2.0e+00|1.2e-09| ✓
chol 1 1
21|0.194|0.194|1.1e-09|1.2e-06|1.3e-03|-4.205359e+01| 0:0:00|1.2e-05|2.0e+00|1.1e-09| ✓
chol 1 1
22|0.299|0.299|9.2e-10|8.6e-07|1.1e-03|-4.205367e+01| 0:0:00|9.5e-06|2.0e+00|9.4e-10| ✓
chol 1 1
23|0.523|0.523|5.9e-10|4.2e-07|8.4e-04|-4.205380e+01| 0:0:00|5.9e-06|1.9e+00|6.6e-10| ✓
chol 1 1
24|0.439|0.439|2.2e-10|2.4e-07|6.8e-04|-4.205388e+01| 0:0:00|4.2e-06|1.9e+00|5.2e-10| ✓
chol 1 1
25|0.563|0.563|1.0e-09|1.0e-07|5.2e-04|-4.205397e+01| 0:0:00|2.8e-06|1.9e+00|3.9e-10| ✓
chol 1 1
26|0.110|0.110|2.4e-09|9.4e-08|5.1e-04|-4.205399e+01| 0:0:00|2.6e-06|1.9e+00|3.8e-10| ✓
chol 1 1
27|0.569|0.569|4.8e-09|4.1e-08|4.1e-04|-4.205406e+01| 0:0:00|1.8e-06|1.9e+00|2.9e-10| ✓
chol 1 1
28|0.098|0.098|6.3e-09|3.8e-08|4.1e-04|-4.205407e+01| 0:0:00|1.8e-06|1.9e+00|2.9e-10| ✓
chol 1 1
29|0.245|0.245|8.4e-09|2.9e-08|3.9e-04|-4.205409e+01| 0:0:00|1.6e-06|1.9e+00|2.6e-10| ✓
chol 1 1
30|0.557|0.557|9.4e-09|1.4e-08|3.1e-04|-4.205415e+01| 0:0:00|1.2e-06|1.8e+00|2.0e-10| ✓
chol 1 1
31|0.423|0.423|1.3e-08|8.3e-09|2.7e-04|-4.205419e+01| 0:0:00|1.0e-06|1.8e+00|1.7e-10| ✓
chol 1 1
32|0.714|0.714|1.2e-08|3.1e-09|1.8e-04|-4.205424e+01| 0:0:00|7.3e-07|1.8e+00|1.1e-10| ✓
chol 1 1
33|0.663|0.663|3.0e-08|1.5e-09|1.5e-04|-4.205426e+01| 0:0:00|5.3e-07|1.7e+00|9.5e-11| ✓
chol 1 1
34|0.112|0.112|4.2e-08|1.5e-09|1.5e-04|-4.205426e+01| 0:0:00|5.2e-07|1.6e+00|9.6e-11|

```

Stop: progress is too slow

```

-----
number of iterations    = 34
primal objective value = -4.20541980e+01
dual   objective value = -4.20543235e+01
gap := trace(XZ)       = 1.54e-04
relative gap           = 3.57e-06

```

```
actual relative gap      = 1.47e-06
rel. primal infeas       = 4.16e-08
rel. dual   infeas       = 1.46e-09
norm(X), norm(y), norm(Z) = 5.0e+03, 6.9e+01, 2.5e+01
norm(A), norm(b), norm(C) = 8.0e+02, 4.9e+00, 7.6e+01
Total CPU time (secs)    = 0.25
CPU time per iteration   = 0.01
termination code         = -5
DIMACS errors: 4.2e-08  0.0e+00  1.5e-09  0.0e+00  1.5e-06  1.8e-06
-----
```

```
ans =
```

```
42.0543
```

```
Iteration    8    Total error is: 0.026375
```

```
The total representation error of the testing signals is: 0.2597
```

```
>>
```