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>> demo_Polynomial_Dictionary_Learning
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Starting to train the dictionary
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solving the quadratic problem with YALMIP...
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num. of constraints = 85
dim. of socp var = 86, num. of socp blk = 1
dim. of linear var = 800
dim. of free var = 10
*** convert ublk to linear blk
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SDPT3: homogeneous self-dual path-following algorithms
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version	predcorr	gam	expon	it	pstep	dstep	pinfeas	dinfeas	gap	mean(obj)	cputime	kap	tau	theta
HKM	1	0.000	1	0	0.000	0.000	1.4e+01	1.3e+02	1.1e+07	1.107923e+04	0:0:00	1.1e+07	1.0e+00	1.1e+00
0e+00 chol 1 1														
				1	0.008	0.008	1.4e+01	1.3e+02	1.1e+07	1.109365e+04	0:0:00	1.1e+07	1.0e+00	9.9e-01
01 chol 1 1														
				2	0.033	0.033	1.4e+01	1.3e+02	1.1e+07	1.113252e+04	0:0:00	1.1e+07	1.0e+00	9.6e-01
01 chol 1 1														
				3	0.039	0.039	1.3e+01	1.2e+02	1.1e+07	1.122403e+04	0:0:00	1.1e+07	9.9e-01	9.3e-01
01 chol 1 1														
				4	0.546	0.546	6.2e+00	5.8e+01	5.1e+06	1.134924e+04	0:0:00	4.9e+06	9.9e-01	4.3e-01
01 chol 1 1														
				5	0.753	0.753	1.6e+00	1.5e+01	1.3e+06	1.133174e+04	0:0:00	1.2e+06	9.9e-01	1.1e-01
01 chol 1 1														
				6	0.712	0.712	4.7e-01	4.4e+00	3.9e+05	1.097308e+04	0:0:00	3.3e+05	1.0e+00	3.3e-01
02 chol 1 1														
				7	0.217	0.217	4.1e-01	3.8e+00	3.7e+05	1.167974e+04	0:0:00	2.7e+05	9.7e-01	2.8e-01
02 chol 1 1														
				8	0.565	0.565	2.2e-01	2.0e+00	2.1e+05	1.162742e+04	0:0:00	1.2e+05	9.6e-01	1.5e-01
02 chol 1 1														
				9	0.545	0.545	1.5e-01	1.4e+00	1.7e+05	1.291892e+04	0:0:00	6.3e+04	9.0e-01	9.5e-01
03 chol 1 1														
				10	0.755	0.755	6.6e-02	6.2e-01	7.8e+04	1.051868e+04	0:0:01	1.1e+04	9.7e-01	4.5e-01
03 chol 1 1														
				11	0.744	0.744	2.8e-02	2.6e-01	2.8e+04	6.130414e+03	0:0:01	5.6e+02	1.2e+00	2.3e-01
03 chol 1 1														
				12	0.796	0.796	1.0e-02	9.1e-02	9.3e+03	2.792112e+03	0:0:01	2.6e+01	1.4e+00	9.7e-01
04 chol 1 1														
				13	1.000	1.000	1.9e-03	1.7e-02	1.7e+03	5.479923e+02	0:0:01	9.3e+00	1.7e+00	2.2e-01
04 chol 1 1														
				14	0.604	0.604	2.0e-03	1.2e-02	1.2e+03	3.653738e+02	0:0:01	5.4e+00	1.7e+00	1.5e-01
04 chol 1 1														
				15	0.647	0.647	1.4e-03	9.1e-03	8.8e+02	2.635359e+02	0:0:01	3.3e+00	1.8e+00	1.2e-01
04 chol 1 1														
				16	1.000	1.000	1.6e-03	5.3e-03	5.0e+02	1.218924e+02	0:0:01	1.7e+00	1.8e+00	6.8e-01
05 chol 1 1														
				17	1.000	1.000	3.4e-04	3.3e-03	3.1e+02	4.326613e+01	0:0:01	9.7e-01	1.8e+00	4.3e-01

```

05| chol 1 1
18|1.000|1.000|3.2e-04|1.7e-03|1.5e+02|-2.372443e-01| 0:0:01|6.1e-01|1.8e+00|2.3e-✓
05| chol 1 1
19|1.000|1.000|1.5e-04|9.2e-04|8.2e+01|-2.778273e+01| 0:0:01|3.1e-01|1.9e+00|1.2e-✓
05| chol 1 1
20|1.000|1.000|2.3e-04|3.7e-04|3.2e+01|-4.178224e+01| 0:0:01|1.7e-01|1.9e+00|5.0e-✓
06| chol 1 1
21|1.000|1.000|3.3e-05|1.8e-04|1.4e+01|-4.806158e+01| 0:0:01|6.6e-02|1.9e+00|2.1e-✓
06| chol 1 1
22|1.000|1.000|6.7e-06|6.8e-05|5.0e+00|-5.016361e+01| 0:0:01|2.8e-02|1.9e+00|7.8e-✓
07| chol 1 1
23|1.000|1.000|7.5e-06|3.6e-05|2.0e+00|-5.107886e+01| 0:0:01|9.9e-03|1.9e+00|3.3e-✓
07| chol 1 1
24|1.000|1.000|4.2e-06|2.4e-05|7.1e-01|-5.136490e+01| 0:0:01|4.1e-03|2.0e+00|1.2e-✓
07| chol 1 1
25|1.000|1.000|1.5e-06|2.0e-05|2.6e-01|-5.149885e+01| 0:0:01|1.5e-03|2.0e+00|4.4e-✓
08| chol 1 1
26|1.000|1.000|5.1e-07|7.9e-06|8.9e-02|-5.153633e+01| 0:0:01|5.6e-04|2.0e+00|1.5e-✓
08| chol 1 1
27|1.000|1.000|6.8e-07|3.1e-06|2.9e-02|-5.155397e+01| 0:0:01|1.9e-04|2.0e+00|5.0e-✓
09| chol 1 1
28|1.000|1.000|1.8e-06|1.3e-06|1.0e-02|-5.155842e+01| 0:0:01|6.4e-05|2.0e+00|1.7e-✓
09| chol 1 1
29|0.986|0.986|2.2e-06|5.5e-07|3.1e-03|-5.156076e+01| 0:0:01|2.3e-05|2.0e+00|5.2e-✓
10| chol 1 1
30|0.851|0.851|5.4e-06|3.4e-07|1.7e-03|-5.156128e+01| 0:0:01|9.1e-06|2.0e+00|2.7e-✓
10| chol 1 1
31|0.659|0.659|4.2e-06|2.7e-07|1.2e-03|-5.156151e+01| 0:0:01|5.5e-06|2.0e+00|1.7e-✓
10| chol 1 1
32|0.609|0.609|3.8e-06|2.0e-07|8.6e-04|-5.156165e+01| 0:0:01|3.8e-06|2.0e+00|1.2e-✓
10| chol 1 1
33|0.554|0.554|4.8e-06|9.2e-08|6.1e-04|-5.156174e+01| 0:0:01|2.7e-06|2.0e+00|8.6e-✓
11| chol 1 1
34|0.212|0.212|8.0e-06|7.4e-08|5.7e-04|-5.156177e+01| 0:0:01|2.4e-06|2.0e+00|7.8e-✓
11| chol 1 1
35|0.124|0.124|1.1e-05|6.6e-08|5.5e-04|-5.156178e+01| 0:0:01|2.3e-06|2.0e+00|7.5e-✓
11| chol 1 1
36|0.152|0.152|1.6e-05|5.7e-08|5.4e-04|-5.156180e+01| 0:0:01|2.1e-06|2.0e+00|7.3e-✓
11|

```

Stop: progress is too slow

```

-----
number of iterations    = 36
primal objective value = -5.15615961e+01
dual   objective value = -5.15619956e+01
gap := trace(XZ)       = 5.42e-04
relative gap           = 1.03e-05
actual relative gap    = 3.84e-06
rel. primal infeas     = 1.62e-05
rel. dual   infeas     = 5.70e-08
norm(X), norm(y), norm(Z) = 1.9e+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)   = 0.80
CPU time per iteration = 0.02
termination code        = -5

```

DIMACS errors: 1.6e-05 0.0e+00 5.7e-08 0.0e+00 3.8e-06 5.2e-06

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 = 10
*** 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	1.6e+03	1.2e+10	1.207419e+07	0:0:00	1.2e+10	1.0e+00	1.0e+00	chol 1 1	1.207329e+07	0:0:00	1.2e+10	1.0e+00	1.0e+00	1.0e+00	1.0e+00
1	0.000	0.000	2.3e+00	1.6e+03	1.2e+10	1.207752e+07	0:0:00	1.2e+10	1.0e+00	1.0e+00	chol 1 1	1.208047e+07	0:0:00	1.2e+10	1.0e+00	1.0e+00	1.0e+00	1.0e+00
2	0.000	0.000	2.3e+00	1.6e+03	1.2e+10	1.209853e+07	0:0:00	1.2e+10	1.0e+00	1.0e+00	chol 1 1	1.213888e+07	0:0:00	1.1e+10	1.0e+00	1.0e+00	1.0e+00	1.0e+00
3	0.000	0.000	2.3e+00	1.6e+03	1.2e+10	1.215623e+07	0:0:00	6.8e+09	1.0e+00	1.0e+00	chol 2 2	1.206137e+07	0:0:00	1.9e+09	1.0e+00	1.0e+00	1.0e+00	1.0e+00
4	0.016	0.016	2.3e+00	1.6e+03	1.2e+10	1.152750e+07	0:0:00	2.4e+08	1.0e+00	1.0e+00	chol 2 3	1.209853e+07	0:0:00	1.2e+10	1.0e+00	1.0e+00	1.0e+00	1.0e+00
5	0.047	0.047	2.2e+00	1.5e+03	1.2e+10	1.188638e+07	0:0:00	2.3e+08	1.0e+00	1.0e+00	chol 3 4	1.213888e+07	0:0:00	1.1e+10	1.0e+00	1.0e+00	1.0e+00	1.0e+00
6	0.405	0.405	1.3e+00	9.3e+02	7.0e+09	1.152750e+07	0:0:00	2.4e+08	1.0e+00	1.0e+00	chol 2 3	1.206137e+07	0:0:00	1.9e+09	1.0e+00	1.0e+00	1.0e+00	1.0e+00
7	0.724	0.724	3.7e-01	2.6e+02	2.0e+09	1.152750e+07	0:0:00	2.4e+08	1.0e+00	1.0e+00	chol 2 3	1.206137e+07	0:0:00	1.9e+09	1.0e+00	1.0e+00	1.0e+00	1.0e+00
8	0.855	0.855	5.4e-02	3.8e+01	2.9e+08	1.152750e+07	0:0:00	2.4e+08	1.0e+00	1.0e+00	chol 2 3	1.152750e+07	0:0:00	2.4e+08	1.0e+00	1.0e+00	1.0e+00	1.0e+00
9	0.044	0.044	5.3e-02	3.7e+01	3.0e+08	1.188638e+07	0:0:00	2.3e+08	1.0e+00	1.0e+00	chol 3 4	1.188638e+07	0:0:00	2.3e+08	1.0e+00	1.0e+00	1.0e+00	1.0e+00
10	0.204	0.204	4.9e-02	3.4e+01	3.1e+08	1.296536e+07	0:0:00	1.9e+08	9.5e-01	2.0e-01	chol 3 3	1.296536e+07	0:0:00	1.9e+08	9.5e-01	2.0e-01	2.0e-01	2.0e-01
11	0.327	0.327	4.4e-02	3.1e+01	3.3e+08	1.518419e+07	0:0:00	1.5e+08	8.7e-01	1.6e-01	chol 4 4	1.518419e+07	0:0:00	1.5e+08	8.7e-01	1.6e-01	1.6e-01	1.6e-01
12	0.831	0.831	1.2e-02	8.5e+00	9.5e+07	1.235417e+07	0:0:00	1.2e+07	9.5e-01	4.9e-01	chol 6 4	1.235417e+07	0:0:00	1.2e+07	9.5e-01	4.9e-01	4.9e-01	4.9e-01
13	0.794	0.794	5.5e-03	3.8e+00	4.0e+07	8.293897e+06	0:0:00	7.4e+05	1.1e+00	2.5e-01	chol 4 4	8.293897e+06	0:0:00	7.4e+05	1.1e+00	2.5e-01	2.5e-01	2.5e-01
14	0.772	0.772	2.4e-03	1.6e+00	1.5e+07	4.529161e+06	0:0:00	5.4e+04	1.3e+00	1.3e-01	chol 4 4	4.529161e+06	0:0:00	5.4e+04	1.3e+00	1.3e-01	1.3e-01	1.3e-01
15	0.823	0.823	1.4e-03	9.5e-01	9.7e+06	3.224307e+06	0:0:00	2.4e+04	1.4e+00	8.2e-01		3.224307e+06	0:0:00	2.4e+04	1.4e+00	8.2e-01	8.2e-01	8.2e-01

```
04| chol 4 3
16|1.000|1.000|7.9e-04|5.4e-01|5.4e+06| 1.900192e+06| 0:0:00|1.3e+04|1.5e+00|5.0e-✓
04| chol 5 4
17|1.000|1.000|3.9e-04|2.6e-01|2.4e+06| 8.556096e+05| 0:0:00|8.1e+03|1.6e+00|2.5e-✓
04| chol 4 5
18|1.000|1.000|3.5e-04|1.4e-01|1.2e+06| 4.137049e+05| 0:0:00|4.1e+03|1.6e+00|1.3e-✓
04| chol 4 4
19|1.000|1.000|4.8e-04|5.6e-02|4.8e+05| 1.393362e+05| 0:0:00|2.2e+03|1.6e+00|5.6e-✓
05| chol 4 4
20|0.782|0.782|6.1e-04|2.0e-02|1.5e+05| 4.206411e+04| 0:0:00|1.1e+03|1.7e+00|2.0e-✓
05| chol 3 3
21|0.357|0.357|3.8e-04|1.7e-02|1.3e+05| 2.719797e+04| 0:0:00|7.4e+02|1.8e+00|1.8e-✓
05| chol 3 3
22|0.939|0.939|2.5e-04|1.1e-02|8.3e+04| 2.610798e+04| 0:0:00|2.7e+02|1.8e+00|1.2e-✓
05| chol 3 3
23|0.848|0.848|1.1e-04|6.0e-03|4.5e+04| 1.151911e+04| 0:0:00|1.7e+02|1.8e+00|6.7e-✓
06| chol 3 3
24|1.000|1.000|1.0e-04|3.2e-03|2.3e+04| 6.400251e+03| 0:0:00|8.9e+01|1.8e+00|3.6e-✓
06| chol 3 4
25|1.000|1.000|6.9e-05|1.4e-03|9.1e+03| 2.474929e+03| 0:0:00|4.6e+01|1.9e+00|1.6e-✓
06| chol 3 3
26|1.000|1.000|5.5e-05|5.8e-04|3.2e+03| 8.860911e+02| 0:0:00|1.8e+01|1.9e+00|6.8e-✓
07| chol 2 3
27|1.000|1.000|4.3e-05|2.8e-04|1.3e+03| 3.389714e+02| 0:0:00|6.6e+00|2.0e+00|3.4e-✓
07| chol 2 2
28|1.000|1.000|3.4e-05|1.4e-04|5.0e+02| 1.314537e+02| 0:0:00|2.7e+00|2.0e+00|1.7e-✓
07| chol 2 2
29|1.000|1.000|2.5e-05|7.1e-05|2.1e+02| 4.393287e+01| 0:0:00|1.1e+00|2.0e+00|8.4e-✓
08| chol 2 2
30|1.000|1.000|1.9e-05|3.8e-05|9.2e+01| 1.452958e+01| 0:0:00|4.6e-01|2.0e+00|4.3e-✓
08| chol 2 2
31|0.920|0.920|1.3e-05|2.1e-05|5.1e+01|-7.639972e+00| 0:0:00|2.2e-01|2.0e+00|2.2e-✓
08| chol 2 2
32|0.960|0.960|1.0e-05|1.4e-05|2.6e+01|-6.567271e+00| 0:0:00|1.2e-01|2.0e+00|1.2e-✓
08| chol 2 2
33|0.631|0.631|6.8e-06|1.1e-05|2.0e+01|-1.507012e+01| 0:0:01|7.9e-02|2.0e+00|7.8e-✓
09| chol 2 2
34|0.971|0.971|6.3e-06|8.7e-06|1.1e+01|-1.252180e+01| 0:0:01|4.4e-02|2.0e+00|4.7e-✓
09| chol 2 2
35|0.698|0.698|4.1e-06|7.6e-06|7.4e+00|-1.616947e+01| 0:0:01|3.1e-02|2.0e+00|2.9e-✓
09| chol 2 2
36|1.000|1.000|4.1e-06|6.4e-06|3.8e+00|-1.576463e+01| 0:0:01|1.6e-02|2.0e+00|1.9e-✓
09| chol 2 2
37|0.860|0.860|3.2e-06|5.7e-06|2.0e+00|-1.693793e+01| 0:0:01|9.5e-03|2.0e+00|1.2e-✓
09| chol 2 2
38|1.000|1.000|3.1e-06|5.0e-06|9.3e-01|-1.702294e+01| 0:0:01|4.3e-03|2.0e+00|8.9e-✓
10| chol 2 2
39|0.881|0.881|2.7e-06|4.6e-06|4.8e-01|-1.733623e+01| 0:0:01|2.3e-03|2.0e+00|6.8e-✓
10| chol 2 2
40|0.986|0.986|2.7e-06|4.1e-06|2.5e-01|-1.737040e+01| 0:0:01|1.1e-03|2.0e+00|5.8e-✓
10| chol 2 2
41|0.763|0.763|2.5e-06|3.7e-06|1.6e-01|-1.748065e+01| 0:0:01|6.7e-04|2.0e+00|5.2e-✓
10| chol 2 2
42|0.324|0.324|2.6e-06|3.2e-06|1.7e-01|-1.751474e+01| 0:0:01|5.7e-04|2.0e+00|5.1e-✓
```

```

10| chol 2 2
43|0.101|0.101|2.6e-06|2.9e-06|1.9e-01|-1.755801e+01| 0:0:01|5.5e-04|2.0e+00|5.0e-✓
10| chol 2 2
44|0.317|0.317|2.6e-06|2.1e-06|2.0e-01|-1.764000e+01| 0:0:01|5.1e-04|2.0e+00|4.8e-✓
10| chol 2 2
45|0.244|0.244|2.5e-06|1.7e-06|2.2e-01|-1.769057e+01| 0:0:01|4.9e-04|2.0e+00|4.6e-✓
10| chol 2 2
46|0.367|0.367|2.4e-06|1.2e-06|2.1e-01|-1.774906e+01| 0:0:01|4.9e-04|2.0e+00|4.4e-✓
10| chol 2 2
47|0.202|0.202|2.4e-06|1.1e-06|2.2e-01|-1.776605e+01| 0:0:01|4.8e-04|2.0e+00|4.2e-✓
10| chol 2 2
48|0.112|0.112|2.3e-06|1.0e-06|2.4e-01|-1.778111e+01| 0:0:01|4.8e-04|2.0e+00|4.2e-✓
10| chol 2 2
49|0.077|0.077|2.3e-06|1.1e-06|2.7e-01|-1.779553e+01| 0:0:01|4.9e-04|2.0e+00|4.0e-✓
10| chol 2 2
50|0.044|0.044|2.3e-06|1.1e-06|3.0e-01|-1.780396e+01| 0:0:01|4.9e-04|2.0e+00|4.0e-✓
10|
    Stop: maximum number of iterations reached
-----
number of iterations      = 50
primal objective value = -1.66163715e+01
dual   objective value = -1.89915474e+01
gap := trace(XZ)         = 3.04e-01
relative gap              = 1.62e-02
actual relative gap       = 6.49e-02
rel. primal infeas        = 2.29e-06
rel. dual   infeas        = 1.12e-06
norm(X), norm(y), norm(Z) = 2.9e+04, 8.7e+01, 5.5e+01
norm(A), norm(b), norm(C) = 1.9e+05, 2.5e+05, 7.6e+01
Total CPU time (secs)    = 0.75
CPU time per iteration   = 0.01
termination code         = -6
DIMACS errors: 2.3e-06  0.0e+00  1.1e-06  0.0e+00  6.5e-02  8.3e-03
-----

ans =

    18.9818

Iteration    2    Total error is: 0.017199

num. of constraints = 85
dim. of socp var = 86,    num. of socp blk = 1
dim. of linear var = 800
dim. of free var = 10
*** 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|1.9e+03|1.4e+10| 1.368393e+07| 0:0:00|1.4e+10|1.0e+00|1.✓
0e+00| chol 1 1
1|0.000|0.000|2.2e+00|1.9e+03|1.4e+10| 1.368289e+07| 0:0:00|1.4e+10|1.0e+00|1.✓
0e+00| chol 1 1
2|0.000|0.000|2.2e+00|1.9e+03|1.4e+10| 1.368770e+07| 0:0:00|1.4e+10|1.0e+00|1.✓
0e+00| chol 1 2
3|0.000|0.000|2.2e+00|1.9e+03|1.4e+10| 1.369099e+07| 0:0:00|1.4e+10|1.0e+00|1.✓
0e+00| chol 1 1
4|0.016|0.016|2.2e+00|1.9e+03|1.4e+10| 1.371134e+07| 0:0:00|1.4e+10|1.0e+00|9.8e-✓
01| chol 1 2
5|0.048|0.048|2.1e+00|1.8e+03|1.3e+10| 1.375652e+07| 0:0:00|1.3e+10|1.0e+00|9.4e-✓
01| chol 2 2
6|0.409|0.409|1.2e+00|1.1e+03|7.8e+09| 1.377366e+07| 0:0:00|7.7e+09|1.0e+00|5.6e-✓
01| chol 2 2
7|0.719|0.719|3.5e-01|3.1e+02|2.2e+09| 1.366682e+07| 0:0:00|2.2e+09|1.0e+00|1.6e-✓
01| chol 2 2
8|0.855|0.855|5.2e-02|4.5e+01|3.3e+08| 1.306853e+07| 0:0:00|2.7e+08|1.0e+00|2.4e-✓
02| chol 2 3
9|0.044|0.044|5.1e-02|4.5e+01|3.4e+08| 1.347895e+07| 0:0:00|2.6e+08|1.0e+00|2.3e-✓
02| chol 2 4
10|0.205|0.205|4.7e-02|4.1e+01|3.5e+08| 1.469063e+07| 0:0:00|2.2e+08|9.5e-01|2.0e-✓
02| chol 3 3
11|0.328|0.328|4.2e-02|3.7e+01|3.8e+08| 1.722060e+07| 0:0:00|1.7e+08|8.7e-01|1.6e-✓
02| chol 7 4
12|0.830|0.830|1.1e-02|1.0e+01|1.1e+08| 1.399106e+07| 0:0:00|1.3e+07|9.5e-01|4.9e-✓
03| chol 4 5
13|0.795|0.795|5.4e-03|4.5e+00|4.6e+07| 9.411980e+06| 0:0:00|8.4e+05|1.1e+00|2.5e-✓
03| chol 4 4
14|0.780|0.780|2.2e-03|1.8e+00|1.7e+07| 5.007394e+06| 0:0:00|4.8e+04|1.3e+00|1.2e-✓
03| chol 4 4
15|0.766|0.766|1.3e-03|1.1e+00|1.0e+07| 3.358602e+06| 0:0:00|2.6e+04|1.4e+00|7.8e-✓
04| chol 4 4
16|1.000|1.000|7.5e-04|6.3e-01|5.9e+06| 2.107414e+06| 0:0:00|1.4e+04|1.5e+00|4.9e-✓
04| chol 4 5
17|1.000|1.000|3.7e-04|2.9e-01|2.5e+06| 9.180226e+05| 0:0:00|9.0e+03|1.6e+00|2.4e-✓
04| chol 4 4
18|1.000|1.000|2.4e-04|1.5e-01|1.3e+06| 4.375459e+05| 0:0:00|4.4e+03|1.6e+00|1.2e-✓
04| chol 4 4
19|1.000|1.000|2.8e-04|6.4e-02|5.3e+05| 1.605565e+05| 0:0:00|2.3e+03|1.6e+00|5.4e-✓
05| chol 4 6
20|0.925|0.925|4.2e-04|2.1e-02|1.5e+05| 4.256744e+04| 0:0:00|1.0e+03|1.7e+00|1.8e-✓
05| chol 3 3
21|0.428|0.428|2.6e-04|1.8e-02|1.3e+05| 2.980569e+04| 0:0:00|6.5e+02|1.8e+00|1.6e-✓
05| chol 3 4
22|0.954|0.954|1.7e-04|1.0e-02|7.6e+04| 2.330913e+04| 0:0:00|2.6e+02|1.8e+00|9.6e-✓
06| chol 4 3
23|0.947|0.947|9.1e-05|5.7e-03|3.9e+04| 1.004898e+04| 0:0:00|1.5e+02|1.8e+00|5.4e-✓
06| chol 3 3
24|1.000|1.000|7.6e-05|3.2e-03|2.1e+04| 5.645565e+03| 0:0:00|7.7e+01|1.9e+00|3.1e-✓
06| chol 3 3
25|1.000|1.000|6.3e-05|1.5e-03|8.0e+03| 2.199721e+03| 0:0:00|4.1e+01|1.9e+00|1.4e-✓
06| chol 2 2
```

```

26|1.000|1.000|4.9e-05|7.0e-04|3.1e+03| 8.370562e+02| 0:0:00|1.6e+01|1.9e+00|7.0e-✓
07| chol 2 2
27|1.000|1.000|4.0e-05|3.5e-04|1.2e+03| 3.470024e+02| 0:0:00|6.5e+00|2.0e+00|3.5e-✓
07| chol 2 2
28|1.000|1.000|3.1e-05|1.8e-04|5.1e+02| 1.265513e+02| 0:0:00|2.6e+00|2.0e+00|1.9e-✓
07| chol 2 2
29|1.000|1.000|2.5e-05|1.0e-04|2.2e+02| 5.965651e+01| 0:0:00|1.1e+00|2.0e+00|1.0e-✓
07| chol 2 2
30|0.976|0.976|1.9e-05|5.9e-05|1.0e+02| 5.886405e+00| 0:0:00|4.9e-01|2.0e+00|5.9e-✓
08| chol 2 3
31|0.966|0.966|1.6e-05|3.9e-05|5.4e+01| 8.922734e+00| 0:0:00|2.4e-01|2.0e+00|3.8e-✓
08| chol 2 2
32|0.550|0.550|1.2e-05|2.9e-05|4.4e+01|-1.445959e+01| 0:0:01|1.7e-01|2.0e+00|2.7e-✓
08| chol 2 2
33|0.953|0.953|1.1e-05|2.1e-05|2.8e+01|-1.245170e+00| 0:0:01|1.0e-01|2.0e+00|1.9e-✓
08| chol 2 2
34|0.586|0.586|8.3e-06|1.6e-05|2.2e+01|-1.471832e+01| 0:0:01|7.8e-02|2.0e+00|1.3e-✓
08| chol 2 2
35|0.989|0.989|7.9e-06|1.2e-05|1.3e+01|-8.062401e+00| 0:0:01|4.8e-02|2.0e+00|9.4e-✓
09| chol 2 2
36|0.585|0.585|5.9e-06|9.4e-06|9.8e+00|-1.454866e+01| 0:0:01|3.6e-02|2.0e+00|6.6e-✓
09| chol 2 2
37|1.000|1.000|5.9e-06|7.5e-06|5.6e+00|-1.162464e+01| 0:0:01|2.2e-02|2.0e+00|5.1e-✓
09| chol 2 2
38|0.652|0.652|4.7e-06|6.5e-06|4.0e+00|-1.431812e+01| 0:0:01|1.6e-02|2.0e+00|3.7e-✓
09| chol 2 2
39|1.000|1.000|4.6e-06|5.4e-06|2.2e+00|-1.329791e+01| 0:0:01|8.8e-03|2.0e+00|2.9e-✓
09| chol 2 2
40|0.655|0.655|4.0e-06|4.9e-06|1.5e+00|-1.440538e+01| 0:0:01|6.1e-03|2.0e+00|2.4e-✓
09| chol 2 2
41|0.986|0.986|4.0e-06|4.2e-06|9.1e-01|-1.390760e+01| 0:0:01|3.4e-03|2.0e+00|2.0e-✓
09| chol 2 2
42|0.458|0.458|3.5e-06|4.0e-06|8.1e-01|-1.452780e+01| 0:0:01|2.8e-03|2.0e+00|1.7e-✓
09| chol 2 2
43|0.647|0.647|3.5e-06|3.7e-06|6.6e-01|-1.424522e+01| 0:0:01|2.1e-03|2.0e+00|1.6e-✓
09| chol 2 2
44|0.267|0.267|3.4e-06|3.1e-06|6.7e-01|-1.433553e+01| 0:0:01|1.9e-03|2.0e+00|1.5e-✓
09| chol 2 2
45|0.340|0.340|3.3e-06|2.5e-06|6.7e-01|-1.441403e+01| 0:0:01|1.8e-03|2.0e+00|1.4e-✓
09| chol 2 2
46|0.383|0.383|3.1e-06|2.0e-06|6.7e-01|-1.448943e+01| 0:0:01|1.7e-03|2.0e+00|1.3e-✓
09| chol 2 2
47|0.191|0.191|3.1e-06|1.9e-06|7.1e-01|-1.451213e+01| 0:0:01|1.6e-03|2.0e+00|1.2e-✓
09| chol 2 2
48|0.189|0.189|3.0e-06|1.9e-06|7.8e-01|-1.454451e+01| 0:0:01|1.6e-03|2.0e+00|1.2e-✓
09| chol 2 2
49|0.090|0.090|2.9e-06|2.0e-06|8.7e-01|-1.457435e+01| 0:0:01|1.6e-03|2.0e+00|1.2e-✓
09| chol 2 2
50|0.378|0.378|2.8e-06|1.6e-06|8.3e-01|-1.470324e+01| 0:0:01|1.7e-03|2.0e+00|1.1e-✓
09|

```

Stop: maximum number of iterations reached

```

-----
number of iterations    = 50
primal objective value = -1.09929389e+01

```

```

dual    objective value = -1.84135360e+01
gap := trace(XZ)        = 8.32e-01
relative gap            = 5.30e-02
actual relative gap     = 2.44e-01
rel. primal infeas      = 2.81e-06
rel. dual   infeas      = 1.59e-06
norm(X), norm(y), norm(Z) = 6.0e+04, 9.4e+01, 6.2e+01
norm(A), norm(b), norm(C) = 2.2e+05, 3.3e+05, 7.6e+01
Total CPU time (secs)   = 0.77
CPU time per iteration = 0.02
termination code        = -6
DIMACS errors: 2.8e-06  0.0e+00  1.6e-06  0.0e+00  2.4e-01  2.7e-02
-----

```

ans =

18.3836

Iteration 3 Total error is: 0.015673

```

num. of constraints = 85
dim. of socp var = 86, num. of socp blk = 1
dim. of linear var = 800
dim. of free var = 10
*** 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|2.1e+03|1.5e+10| 1.448522e+07| 0:0:00|1.5e+10|1.0e+00|1.✓
0e+00| chol 1 1
1|0.000|0.000|2.2e+00|2.1e+03|1.5e+10| 1.448412e+07| 0:0:00|1.5e+10|1.0e+00|1.✓
0e+00| chol 1 1
2|0.000|0.000|2.2e+00|2.1e+03|1.5e+10| 1.448921e+07| 0:0:00|1.5e+10|1.0e+00|1.✓
0e+00| chol 1 2
3|0.000|0.000|2.2e+00|2.1e+03|1.5e+10| 1.449267e+07| 0:0:00|1.5e+10|1.0e+00|1.✓
0e+00| chol 1 1
4|0.016|0.016|2.1e+00|2.1e+03|1.4e+10| 1.451412e+07| 0:0:00|1.4e+10|1.0e+00|9.8e-✓
01| chol 1 2
5|0.049|0.049|2.0e+00|2.0e+03|1.4e+10| 1.456157e+07| 0:0:00|1.4e+10|1.0e+00|9.4e-✓
01| chol 2 2
6|0.403|0.403|1.2e+00|1.2e+03|8.4e+09| 1.458097e+07| 0:0:00|8.2e+09|1.0e+00|5.6e-✓
01| chol 2 2
7|0.719|0.719|3.5e-01|3.4e+02|2.4e+09| 1.446878e+07| 0:0:00|2.3e+09|1.0e+00|1.6e-✓
01| chol 2 2
8|0.857|0.857|5.0e-02|4.9e+01|3.5e+08| 1.383849e+07| 0:0:00|2.9e+08|1.0e+00|2.4e-✓
02| chol 2 3
9|0.044|0.044|5.0e-02|4.8e+01|3.6e+08| 1.427330e+07| 0:0:00|2.8e+08|1.0e+00|2.3e-✓

```



```
02| chol 3 3
10|0.205|0.205|4.6e-02|4.4e+01|3.7e+08| 1.555981e+07| 0:0:00|2.4e+08|9.5e-01|2.0e-✓
02| chol 4 4
11|0.329|0.329|4.1e-02|3.9e+01|4.0e+08| 1.820863e+07| 0:0:00|1.8e+08|8.7e-01|1.6e-✓
02| chol 4 5
12|0.830|0.830|1.1e-02|1.1e+01|1.1e+08| 1.485469e+07| 0:0:00|1.5e+07|9.5e-01|5.0e-✓
03| chol 4 4
13|0.796|0.796|5.2e-03|4.9e+00|4.9e+07| 1.003099e+07| 0:0:00|9.2e+05|1.1e+00|2.5e-✓
03| chol 5 3
14|0.775|0.775|2.1e-03|1.9e+00|1.8e+07| 5.288264e+06| 0:0:00|5.1e+04|1.3e+00|1.2e-✓
03| chol 4 5
15|0.725|0.725|1.2e-03|1.1e+00|9.9e+06| 3.373697e+06| 0:0:00|2.8e+04|1.5e+00|7.7e-✓
04| chol 5 4
16|1.000|1.000|7.2e-04|6.7e-01|6.1e+06| 2.207948e+06| 0:0:00|1.5e+04|1.5e+00|4.9e-✓
04| chol 5 4
17|1.000|1.000|3.6e-04|3.2e-01|2.8e+06| 1.020335e+06| 0:0:00|9.5e+03|1.6e+00|2.5e-✓
04| chol 4 4
18|1.000|1.000|2.3e-04|1.6e-01|1.4e+06| 4.832907e+05| 0:0:00|4.8e+03|1.6e+00|1.3e-✓
04| chol 4 4
19|1.000|1.000|2.7e-04|7.1e-02|5.7e+05| 1.766911e+05| 0:0:00|2.5e+03|1.6e+00|5.6e-✓
05| chol 4 4
20|1.000|1.000|2.8e-04|2.6e-02|1.8e+05| 5.122978e+04| 0:0:00|9.9e+02|1.7e+00|2.1e-✓
05| chol 3 3
21|0.643|0.643|2.0e-04|1.8e-02|1.3e+05| 3.551844e+04| 0:0:00|5.3e+02|1.7e+00|1.5e-✓
05| chol 4 4
22|0.994|0.994|1.5e-04|1.0e-02|7.0e+04| 2.094623e+04| 0:0:00|2.4e+02|1.8e+00|8.8e-✓
06| chol 3 3
23|1.000|1.000|7.1e-05|6.0e-03|3.9e+04| 1.008387e+04| 0:0:00|1.3e+02|1.8e+00|5.2e-✓
06| chol 3 3
24|1.000|1.000|8.1e-05|3.2e-03|1.9e+04| 5.247896e+03| 0:0:00|7.7e+01|1.9e+00|2.9e-✓
06| chol 3 3
25|1.000|1.000|5.7e-05|1.5e-03|6.8e+03| 1.627370e+03| 0:0:00|3.7e+01|1.9e+00|1.3e-✓
06| chol 2 3
26|1.000|1.000|5.1e-05|7.8e-04|2.9e+03| 8.665891e+02| 0:0:00|1.4e+01|1.9e+00|7.2e-✓
07| chol 2 2
27|1.000|1.000|3.6e-05|4.1e-04|1.3e+03| 2.423648e+02| 0:0:00|6.0e+00|2.0e+00|3.8e-✓
07| chol 2 2
28|1.000|1.000|3.2e-05|2.4e-04|5.8e+02| 1.944427e+02| 0:0:00|2.7e+00|2.0e+00|2.3e-✓
07| chol 2 2
29|0.834|0.834|2.3e-05|1.5e-04|3.4e+02| 2.833970e+01| 0:0:00|1.5e+00|2.0e+00|1.4e-✓
07| chol 2 2
30|1.000|1.000|2.1e-05|9.7e-05|1.7e+02| 5.595463e+01| 0:0:00|7.3e-01|2.0e+00|9.1e-✓
08| chol 2 2
31|0.790|0.790|1.6e-05|6.4e-05|1.0e+02|-3.759337e+00| 0:0:00|4.5e-01|2.0e+00|5.9e-✓
08| chol 2 4
32|1.000|1.000|1.5e-05|4.5e-05|5.5e+01| 1.208274e+01| 0:0:00|2.3e-01|2.0e+00|4.1e-✓
08| chol 2 2
33|0.612|0.612|1.1e-05|3.3e-05|4.2e+01|-1.371912e+01| 0:0:00|1.6e-01|2.0e+00|2.9e-✓
08| chol 2 2
34|0.956|0.956|1.1e-05|2.3e-05|2.5e+01|-5.920971e-01| 0:0:00|9.6e-02|2.0e+00|2.1e-✓
08| chol 2 2
35|0.562|0.562|8.2e-06|1.8e-05|2.0e+01|-1.411575e+01| 0:0:00|7.3e-02|2.0e+00|1.5e-✓
08| chol 2 2
36|0.967|0.967|7.8e-06|1.4e-05|1.2e+01|-6.653803e+00| 0:0:00|4.5e-02|2.0e+00|1.1e-✓
```

```

08| chol 2 2
37|0.545|0.545|6.1e-06|1.1e-05|9.8e+00|-1.367626e+01| 0:0:01|3.5e-02|2.0e+00|8.4e-✓
09| chol 2 2
38|0.987|0.987|6.0e-06|8.5e-06|5.8e+00|-9.834920e+00| 0:0:01|2.2e-02|2.0e+00|6.4e-✓
09| chol 2 2
39|0.566|0.566|4.9e-06|7.3e-06|4.5e+00|-1.327256e+01| 0:0:01|1.7e-02|2.0e+00|5.0e-✓
09| chol 2 2
40|0.973|0.973|4.7e-06|5.9e-06|2.8e+00|-1.135259e+01| 0:0:01|1.0e-02|2.0e+00|4.0e-✓
09| chol 2 2
41|0.526|0.526|4.0e-06|5.3e-06|2.3e+00|-1.319015e+01| 0:0:01|8.0e-03|2.0e+00|3.2e-✓
09| chol 4 2
42|0.780|0.780|3.9e-06|4.6e-06|1.6e+00|-1.228762e+01| 0:0:01|5.6e-03|2.0e+00|2.8e-✓
09| chol 2 2
43|0.892|0.892|3.5e-06|3.9e-06|8.3e-01|-1.273953e+01| 0:0:01|3.8e-03|2.0e+00|2.2e-✓
09| chol 2 2
44|0.956|0.956|3.3e-06|3.4e-06|4.1e-01|-1.276692e+01| 0:0:01|1.9e-03|2.0e+00|1.9e-✓
09| chol 2 2
45|0.534|0.534|3.1e-06|3.2e-06|3.6e-01|-1.304965e+01| 0:0:01|1.4e-03|2.0e+00|1.7e-✓
09| chol 2 2
46|0.281|0.281|3.1e-06|2.7e-06|3.8e-01|-1.302336e+01| 0:0:01|1.2e-03|2.0e+00|1.7e-✓
09| chol 2 2
47|0.213|0.213|3.1e-06|2.5e-06|4.1e-01|-1.305998e+01| 0:0:01|1.1e-03|2.0e+00|1.7e-✓
09| chol 2 2
48|0.312|0.312|3.0e-06|2.2e-06|4.2e-01|-1.307611e+01| 0:0:01|1.1e-03|2.0e+00|1.6e-✓
09| chol 2 2
49|0.092|0.092|3.0e-06|2.2e-06|4.7e-01|-1.309667e+01| 0:0:01|1.1e-03|2.0e+00|1.5e-✓
09| chol 2 2
50|0.073|0.073|3.0e-06|2.2e-06|5.3e-01|-1.313880e+01| 0:0:01|1.1e-03|2.0e+00|1.5e-✓
09|

```

Stop: maximum number of iterations reached

```

-----
number of iterations    = 50
primal objective value = -7.65582016e+00
dual   objective value = -1.86217701e+01
gap := trace(XZ)       = 5.32e-01
relative gap           = 3.76e-02
actual relative gap    = 4.02e-01
rel. primal infeas     = 2.98e-06
rel. dual   infeas     = 2.20e-06
norm(X), norm(y), norm(Z) = 3.5e+04, 9.8e+01, 6.6e+01
norm(A), norm(b), norm(C) = 2.4e+05, 3.7e+05, 7.6e+01
Total CPU time (secs)   = 0.69
CPU time per iteration = 0.01
termination code        = -6
DIMACS errors: 3.0e-06  0.0e+00  2.2e-06  0.0e+00  4.0e-01  2.0e-02
-----

```

ans =

18.5967

Iteration 4 Total error is: 0.014811

num. of constraints = 85

```

dim. of socp   var = 86,   num. of socp blk = 1
dim. of linear var = 800
dim. of free   var = 10
*** 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|2.2e+03|1.5e+10| 1.478378e+07| 0:0:00|1.5e+10|1.0e+00|1.✓
0e+00| chol 1 1
1|0.000|0.000|2.1e+00|2.2e+03|1.5e+10| 1.478264e+07| 0:0:00|1.5e+10|1.0e+00|1.✓
0e+00| chol 1 1
2|0.000|0.000|2.1e+00|2.2e+03|1.5e+10| 1.478787e+07| 0:0:00|1.5e+10|1.0e+00|1.✓
0e+00| chol 1 2
3|0.000|0.000|2.1e+00|2.2e+03|1.5e+10| 1.479140e+07| 0:0:00|1.5e+10|1.0e+00|1.✓
0e+00| chol 1 1
4|0.015|0.015|2.1e+00|2.1e+03|1.5e+10| 1.481342e+07| 0:0:00|1.5e+10|1.0e+00|9.8e-✓
01| chol 1 2
5|0.048|0.048|2.0e+00|2.0e+03|1.4e+10| 1.486209e+07| 0:0:00|1.4e+10|1.0e+00|9.4e-✓
01| chol 2 2
6|0.403|0.403|1.2e+00|1.2e+03|8.6e+09| 1.488237e+07| 0:0:00|8.4e+09|1.0e+00|5.7e-✓
01| chol 2 2
7|0.719|0.719|3.4e-01|3.5e+02|2.4e+09| 1.476819e+07| 0:0:00|2.4e+09|1.0e+00|1.6e-✓
01| chol 2 2
8|0.856|0.856|5.0e-02|5.0e+01|3.6e+08| 1.412620e+07| 0:0:00|3.0e+08|1.0e+00|2.4e-✓
02| chol 3 4
9|0.044|0.044|5.0e-02|5.0e+01|3.7e+08| 1.457229e+07| 0:0:00|2.9e+08|1.0e+00|2.3e-✓
02| chol 3 4
10|0.207|0.207|4.5e-02|4.6e+01|3.8e+08| 1.589968e+07| 0:0:00|2.4e+08|9.5e-01|2.0e-✓
02| chol 4 3
11|0.331|0.331|4.0e-02|4.1e+01|4.0e+08| 1.859600e+07| 0:0:00|1.8e+08|8.7e-01|1.6e-✓
02| chol 3 4
12|0.830|0.830|1.1e-02|1.1e+01|1.2e+08| 1.521421e+07| 0:0:00|1.5e+07|9.5e-01|5.0e-✓
03| chol 4 4
13|0.801|0.801|5.1e-03|5.1e+00|5.1e+07| 1.039473e+07| 0:0:00|9.7e+05|1.1e+00|2.6e-✓
03| chol 4 4
14|0.770|0.770|2.2e-03|2.0e+00|1.8e+07| 5.460705e+06| 0:0:00|5.4e+04|1.3e+00|1.3e-✓
03| chol 4 4
15|0.717|0.717|1.2e-03|1.1e+00|1.0e+07| 3.436306e+06| 0:0:00|2.9e+04|1.5e+00|7.7e-✓
04| chol 4 4
16|1.000|1.000|7.1e-04|6.9e-01|6.3e+06| 2.267322e+06| 0:0:00|1.5e+04|1.5e+00|4.9e-✓
04| chol 4 4
17|1.000|1.000|3.7e-04|3.3e-01|2.9e+06| 1.046375e+06| 0:0:00|9.7e+03|1.6e+00|2.5e-✓
04| chol 4 4
18|1.000|1.000|2.3e-04|1.7e-01|1.4e+06| 4.852158e+05| 0:0:00|4.9e+03|1.6e+00|1.3e-✓
04| chol 4 5
19|1.000|1.000|2.4e-04|7.8e-02|6.2e+05| 1.971125e+05| 0:0:00|2.5e+03|1.6e+00|5.9e-✓
05| chol 7 4

```

```
20|1.000|1.000|3.5e-04|2.7e-02|1.9e+05| 5.156873e+04| 0:0:00|1.1e+03|1.7e+00|2.1e-✓  
05| chol 3 3  
21|0.657|0.657|2.3e-04|1.9e-02|1.3e+05| 3.670877e+04| 0:0:00|5.5e+02|1.7e+00|1.5e-✓  
05| chol 3 3  
22|1.000|1.000|1.3e-04|1.1e-02|7.2e+04| 2.155567e+04| 0:0:00|2.3e+02|1.8e+00|8.7e-✓  
06| chol 3 3  
23|1.000|1.000|6.7e-05|6.1e-03|4.0e+04| 1.091359e+04| 0:0:00|1.4e+02|1.8e+00|5.2e-✓  
06| chol 3 3  
24|1.000|1.000|7.4e-05|3.1e-03|1.8e+04| 5.080487e+03| 0:0:00|7.9e+01|1.9e+00|2.7e-✓  
06| chol 3 3  
25|1.000|1.000|4.8e-05|1.5e-03|7.1e+03| 1.754025e+03| 0:0:00|3.6e+01|1.9e+00|1.3e-✓  
06| chol 2 2  
26|1.000|1.000|4.2e-05|7.5e-04|2.8e+03| 8.123182e+02| 0:0:00|1.4e+01|1.9e+00|6.7e-✓  
07| chol 2 2  
27|1.000|1.000|3.1e-05|3.9e-04|1.2e+03| 2.470845e+02| 0:0:00|5.8e+00|2.0e+00|3.5e-✓  
07| chol 2 2  
28|1.000|1.000|2.7e-05|2.2e-04|5.6e+02| 1.887107e+02| 0:0:00|2.6e+00|2.0e+00|2.0e-✓  
07| chol 2 2  
29|0.810|0.810|1.9e-05|1.3e-04|3.4e+02| 2.473231e+01| 0:0:00|1.5e+00|2.0e+00|1.2e-✓  
07| chol 2 2  
30|1.000|1.000|1.7e-05|8.2e-05|1.8e+02| 5.899020e+01| 0:0:00|7.3e-01|2.0e+00|7.4e-✓  
08| chol 2 2  
31|0.671|0.671|1.2e-05|5.3e-05|1.2e+02|-4.029098e+00| 0:0:00|5.0e-01|2.0e+00|4.8e-✓  
08| chol 2 2  
32|1.000|1.000|1.1e-05|3.5e-05|7.0e+01| 1.833680e+01| 0:0:00|2.7e-01|2.0e+00|3.0e-✓  
08| chol 2 2  
33|0.623|0.623|7.4e-06|2.3e-05|5.2e+01|-9.429825e+00| 0:0:00|2.0e-01|2.0e+00|2.0e-✓  
08| chol 2 2  
34|1.000|1.000|7.2e-06|1.6e-05|2.9e+01| 1.098648e+00| 0:0:00|1.1e-01|2.0e+00|1.3e-✓  
08| chol 2 2  
35|0.661|0.661|4.8e-06|1.2e-05|2.1e+01|-1.055456e+01| 0:0:01|8.1e-02|2.0e+00|8.2e-✓  
09| chol 2 2  
36|1.000|1.000|4.7e-06|8.6e-06|1.1e+01|-6.911268e+00| 0:0:01|4.6e-02|2.0e+00|5.4e-✓  
09| chol 2 2  
37|0.667|0.667|3.4e-06|7.0e-06|7.8e+00|-1.134271e+01| 0:0:01|3.2e-02|2.0e+00|3.6e-✓  
09| chol 2 2  
38|1.000|1.000|3.3e-06|5.7e-06|4.2e+00|-1.017912e+01| 0:0:01|1.7e-02|2.0e+00|2.5e-✓  
09| chol 2 2  
39|0.720|0.720|2.6e-06|5.1e-06|2.7e+00|-1.184944e+01| 0:0:01|1.1e-02|2.0e+00|1.8e-✓  
09| chol 2 2  
40|1.000|1.000|2.5e-06|4.3e-06|1.4e+00|-1.157523e+01| 0:0:01|5.9e-03|2.0e+00|1.4e-✓  
09| chol 2 2  
41|0.770|0.770|2.2e-06|3.9e-06|8.5e-01|-1.215013e+01| 0:0:01|3.7e-03|2.0e+00|1.1e-✓  
09| chol 2 2  
42|0.998|0.998|2.2e-06|3.4e-06|4.3e-01|-1.210212e+01| 0:0:01|1.9e-03|2.0e+00|9.5e-✓  
10| chol 2 2  
43|0.640|0.640|2.0e-06|3.2e-06|3.2e-01|-1.228511e+01| 0:0:01|1.3e-03|2.0e+00|8.6e-✓  
10| chol 2 2  
44|0.669|0.669|2.0e-06|2.9e-06|2.3e-01|-1.229880e+01| 0:0:01|9.0e-04|2.0e+00|8.0e-✓  
10| chol 2 2  
45|0.313|0.313|2.0e-06|2.2e-06|2.7e-01|-1.240544e+01| 0:0:01|7.8e-04|2.0e+00|7.8e-✓  
10| chol 2 2  
46|0.155|0.155|2.0e-06|2.0e-06|3.0e-01|-1.245737e+01| 0:0:01|7.5e-04|2.0e+00|7.6e-✓  
10| chol 2 2
```

```

47|0.177|0.177|1.9e-06|1.8e-06|3.4e-01|-1.252290e+01| 0:0:01|7.3e-04|2.0e+00|7.4e-✓
10| chol 2 2
48|0.108|0.108|1.9e-06|1.8e-06|3.8e-01|-1.255194e+01| 0:0:01|7.3e-04|2.0e+00|7.2e-✓
10| chol 2 2
49|0.034|0.034|1.9e-06|1.8e-06|4.2e-01|-1.258160e+01| 0:0:01|7.4e-04|2.0e+00|7.1e-✓
10| chol 2 2
50|0.021|0.021|1.9e-06|1.9e-06|4.7e-01|-1.258378e+01| 0:0:01|7.4e-04|2.0e+00|7.1e-✓
10|

```

Stop: maximum number of iterations reached

```

-----
number of iterations      = 50
primal objective value = -1.00459167e+01
dual   objective value = -1.51216377e+01
gap := trace(XZ)         = 4.72e-01
relative gap              = 3.47e-02
actual relative gap       = 1.94e-01
rel. primal infeas        = 1.89e-06
rel. dual   infeas        = 1.89e-06
norm(X), norm(y), norm(Z) = 3.4e+04, 9.4e+01, 6.3e+01
norm(A), norm(b), norm(C) = 2.5e+05, 4.0e+05, 7.6e+01
Total CPU time (secs)    = 0.72
CPU time per iteration   = 0.01
termination code         = -6
DIMACS errors: 1.9e-06  0.0e+00  1.9e-06  0.0e+00  1.9e-01  1.8e-02
-----

```

ans =

15.1009

Iteration 5 Total error is: 0.014405

```

num. of constraints = 85
dim. of socp var = 86, num. of socp blk = 1
dim. of linear var = 800
dim. of free var = 10
*** 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|2.2e+03|1.5e+10| 1.497536e+07| 0:0:00|1.5e+10|1.0e+00|1.✓
0e+00| chol 1 1
1|0.000|0.000|2.1e+00|2.2e+03|1.5e+10| 1.497420e+07| 0:0:00|1.5e+10|1.0e+00|1.✓
0e+00| chol 1 1
2|0.000|0.000|2.1e+00|2.2e+03|1.5e+10| 1.497953e+07| 0:0:00|1.5e+10|1.0e+00|1.✓
0e+00| chol 1 2
3|0.000|0.000|2.1e+00|2.2e+03|1.5e+10| 1.498312e+07| 0:0:00|1.5e+10|1.0e+00|1.✓

```

```
0e+00| chol 1 1
4|0.015|0.015|2.1e+00|2.2e+03|1.5e+10| 1.500556e+07| 0:0:00|1.5e+10|1.0e+00|9.9e-✓
01| chol 1 2
5|0.048|0.048|2.0e+00|2.1e+03|1.4e+10| 1.505521e+07| 0:0:00|1.4e+10|1.0e+00|9.4e-✓
01| chol 2 2
6|0.399|0.399|1.2e+00|1.3e+03|8.7e+09| 1.507748e+07| 0:0:00|8.6e+09|1.0e+00|5.7e-✓
01| chol 2 2
7|0.721|0.721|3.4e-01|3.6e+02|2.5e+09| 1.496203e+07| 0:0:00|2.4e+09|1.0e+00|1.6e-✓
01| chol 2 2
8|0.859|0.859|4.8e-02|5.0e+01|3.6e+08| 1.430696e+07| 0:0:00|2.9e+08|1.0e+00|2.3e-✓
02| chol 3 3
9|0.044|0.044|4.8e-02|5.0e+01|3.7e+08| 1.475439e+07| 0:0:00|2.8e+08|1.0e+00|2.3e-✓
02| chol 3 3
10|0.205|0.205|4.4e-02|4.6e+01|3.8e+08| 1.609728e+07| 0:0:00|2.4e+08|9.5e-01|2.0e-✓
02| chol 3 4
11|0.328|0.328|4.0e-02|4.1e+01|4.1e+08| 1.885447e+07| 0:0:00|1.8e+08|8.7e-01|1.6e-✓
02| chol 3 4
12|0.831|0.831|1.1e-02|1.1e+01|1.2e+08| 1.533175e+07| 0:0:00|1.4e+07|9.5e-01|4.9e-✓
03| chol 4 4
13|0.798|0.798|5.0e-03|5.1e+00|5.0e+07| 1.038560e+07| 0:0:00|9.2e+05|1.1e+00|2.5e-✓
03| chol 4 4
14|0.775|0.775|2.1e-03|2.0e+00|1.8e+07| 5.456998e+06| 0:0:00|5.1e+04|1.3e+00|1.2e-✓
03| chol 4 3
15|0.726|0.726|1.2e-03|1.2e+00|1.0e+07| 3.473034e+06| 0:0:00|2.9e+04|1.5e+00|7.6e-✓
04| chol 4 5
16|1.000|1.000|7.3e-04|7.0e-01|6.3e+06| 2.275218e+06| 0:0:00|1.5e+04|1.5e+00|4.9e-✓
04| chol 5 3
17|1.000|1.000|3.6e-04|3.3e-01|2.8e+06| 1.034401e+06| 0:0:00|9.7e+03|1.6e+00|2.4e-✓
04| chol 4 4
18|1.000|1.000|2.2e-04|1.7e-01|1.4e+06| 4.923111e+05| 0:0:00|4.9e+03|1.6e+00|1.3e-✓
04| chol 4 5
19|1.000|1.000|2.5e-04|8.0e-02|6.3e+05| 1.978641e+05| 0:0:00|2.5e+03|1.6e+00|6.0e-✓
05| chol 4 4
20|1.000|1.000|2.7e-04|2.9e-02|2.0e+05| 5.498523e+04| 0:0:00|1.1e+03|1.7e+00|2.2e-✓
05| chol 4 4
21|0.705|0.705|2.0e-04|2.0e-02|1.3e+05| 3.739408e+04| 0:0:00|5.4e+02|1.7e+00|1.6e-✓
05| chol 3 4
22|1.000|1.000|1.2e-04|1.1e-02|7.5e+04| 2.230129e+04| 0:0:00|2.4e+02|1.8e+00|9.3e-✓
06| chol 4 5
23|1.000|1.000|7.6e-05|7.1e-03|4.4e+04| 1.210758e+04| 0:0:00|1.4e+02|1.8e+00|5.8e-✓
06| chol 3 3
24|1.000|1.000|7.5e-05|3.5e-03|1.8e+04| 4.841897e+03| 0:0:00|8.5e+01|1.9e+00|2.9e-✓
06| chol 3 3
25|1.000|1.000|6.1e-05|1.8e-03|7.4e+03| 1.907207e+03| 0:0:00|3.5e+01|1.9e+00|1.6e-✓
06| chol 3 3
26|1.000|1.000|5.1e-05|9.7e-04|2.9e+03| 8.238329e+02| 0:0:00|1.5e+01|1.9e+00|8.5e-✓
07| chol 2 2
27|1.000|1.000|4.0e-05|5.4e-04|1.3e+03| 2.862000e+02| 0:0:00|6.1e+00|2.0e+00|4.8e-✓
07| chol 3 4
28|1.000|1.000|3.5e-05|3.3e-04|5.6e+02| 1.854619e+02| 0:0:00|2.7e+00|2.0e+00|2.9e-✓
07| chol 3 2
29|0.825|0.825|2.6e-05|2.1e-04|3.3e+02| 1.277291e+01| 0:0:00|1.5e+00|2.0e+00|1.9e-✓
07| chol 2 2
30|1.000|1.000|2.4e-05|1.5e-04|1.7e+02| 6.094799e+01| 0:0:00|7.2e-01|2.0e+00|1.3e-✓
```

```

07| chol 2 3
31|0.624|0.624|1.9e-05|1.1e-04|1.3e+02|-1.745120e+01| 0:0:00|5.0e-01|2.0e+00|9.5e-✓
08| chol 2 2
32|0.978|0.978|1.8e-05|7.9e-05|7.4e+01| 2.392165e+01| 0:0:00|2.8e-01|2.0e+00|7.0e-✓
08| chol 2 2
33|0.533|0.533|1.4e-05|6.0e-05|6.1e+01|-2.023122e+01| 0:0:00|2.2e-01|2.0e+00|5.3e-✓
08| chol 2 2
34|0.967|0.967|1.4e-05|4.6e-05|3.9e+01| 9.013723e+00| 0:0:01|1.4e-01|2.0e+00|4.0e-✓
08| chol 2 2
35|0.506|0.506|1.1e-05|3.5e-05|3.3e+01|-1.855114e+01| 0:0:01|1.1e-01|2.0e+00|3.0e-✓
08| chol 2 2
36|1.000|1.000|1.1e-05|2.7e-05|2.0e+01|-1.493295e+00| 0:0:01|7.2e-02|2.0e+00|2.4e-✓
08| chol 2 2
37|0.543|0.543|8.5e-06|2.1e-05|1.6e+01|-1.534732e+01| 0:0:01|5.6e-02|2.0e+00|1.8e-✓
08| chol 2 2
38|0.983|0.983|8.3e-06|1.7e-05|9.5e+00|-6.840540e+00| 0:0:01|3.5e-02|2.0e+00|1.5e-✓
08| chol 2 2
39|0.473|0.473|6.8e-06|1.4e-05|8.4e+00|-1.441025e+01| 0:0:01|2.8e-02|2.0e+00|1.2e-✓
08| chol 2 2
40|0.970|0.970|6.8e-06|1.1e-05|5.2e+00|-9.314998e+00| 0:0:01|1.9e-02|2.0e+00|9.5e-✓
09| chol 2 2
41|0.498|0.498|5.7e-06|9.6e-06|4.4e+00|-1.342667e+01| 0:0:01|1.5e-02|2.0e+00|7.7e-✓
09| chol 2 2
42|0.977|0.977|5.6e-06|8.0e-06|2.7e+00|-1.069175e+01| 0:0:01|9.8e-03|2.0e+00|6.5e-✓
09| chol 2 2
43|0.517|0.517|4.9e-06|7.1e-06|2.3e+00|-1.294840e+01| 0:0:01|7.8e-03|2.0e+00|5.5e-✓
09| chol 2 2
44|0.791|0.791|4.8e-06|6.3e-06|1.6e+00|-1.168146e+01| 0:0:01|5.5e-03|2.0e+00|4.9e-✓
09| chol 2 2
45|0.869|0.869|4.4e-06|5.3e-06|9.6e-01|-1.211376e+01| 0:0:01|3.8e-03|2.0e+00|4.1e-✓
09| chol 2 2
46|0.919|0.919|4.2e-06|4.6e-06|5.6e-01|-1.200187e+01| 0:0:01|2.2e-03|2.0e+00|3.5e-✓
09| chol 2 2
47|0.492|0.492|3.9e-06|4.3e-06|5.1e-01|-1.256624e+01| 0:0:01|1.7e-03|2.0e+00|3.3e-✓
09| chol 2 2
48|0.485|0.485|3.9e-06|3.8e-06|4.8e-01|-1.235778e+01| 0:0:01|1.4e-03|2.0e+00|3.1e-✓
09| chol 2 2
49|0.177|0.177|3.9e-06|3.7e-06|5.2e-01|-1.237626e+01| 0:0:01|1.4e-03|2.0e+00|3.1e-✓
09| chol 2 2
50|0.112|0.112|3.9e-06|3.7e-06|5.8e-01|-1.239192e+01| 0:0:01|1.3e-03|2.0e+00|3.0e-✓
09|

```

Stop: maximum number of iterations reached

```

-----
number of iterations    = 50
primal objective value = -9.58804966e-01
dual   objective value = -2.38250336e+01
gap := trace(XZ)       = 5.76e-01
relative gap           = 4.30e-02
actual relative gap    = 8.87e-01
rel. primal infeas     = 3.86e-06
rel. dual   infeas     = 3.69e-06
norm(X), norm(y), norm(Z) = 3.1e+04, 1.1e+02, 7.5e+01
norm(A), norm(b), norm(C) = 2.5e+05, 4.1e+05, 7.6e+01
Total CPU time (secs)  = 0.73

```

```

CPU time per iteration = 0.01
termination code       = -6
DIMACS errors: 3.9e-06  0.0e+00  3.7e-06  0.0e+00  8.9e-01  2.2e-02
-----

```

```
ans =
```

```
23.7998
```

```
Iteration    6    Total error is: 0.0145
```

```

num. of constraints = 85
dim. of socp var   = 86,   num. of socp blk = 1
dim. of linear var = 800
dim. of free var   = 10
*** 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|2.2e+03|1.5e+10| 1.495387e+07| 0:0:00|1.5e+10|1.0e+00|1.4
0e+00| chol 1 1
1|0.000|0.000|2.1e+00|2.2e+03|1.5e+10| 1.495271e+07| 0:0:00|1.5e+10|1.0e+00|1.4
0e+00| chol 1 1
2|0.000|0.000|2.1e+00|2.2e+03|1.5e+10| 1.495805e+07| 0:0:00|1.5e+10|1.0e+00|1.4
0e+00| chol 1 2
3|0.000|0.000|2.1e+00|2.2e+03|1.5e+10| 1.496164e+07| 0:0:00|1.5e+10|1.0e+00|1.4
0e+00| chol 1 1
4|0.015|0.015|2.1e+00|2.2e+03|1.5e+10| 1.498414e+07| 0:0:00|1.5e+10|1.0e+00|9.9e-
01| chol 1 2
5|0.048|0.048|2.0e+00|2.1e+03|1.4e+10| 1.503397e+07| 0:0:00|1.4e+10|1.0e+00|9.4e-
01| chol 2 2
6|0.400|0.400|1.2e+00|1.3e+03|8.7e+09| 1.505615e+07| 0:0:00|8.6e+09|1.0e+00|5.7e-
01| chol 2 2
7|0.721|0.721|3.4e-01|3.6e+02|2.5e+09| 1.494070e+07| 0:0:00|2.4e+09|1.0e+00|1.6e-
01| chol 2 2
8|0.859|0.859|4.8e-02|5.0e+01|3.6e+08| 1.428516e+07| 0:0:00|2.9e+08|1.0e+00|2.3e-
02| chol 3 4
9|0.044|0.044|4.8e-02|5.0e+01|3.7e+08| 1.473138e+07| 0:0:00|2.8e+08|1.0e+00|2.3e-
02| chol 2 3
10|0.206|0.206|4.4e-02|4.6e+01|3.8e+08| 1.606927e+07| 0:0:00|2.4e+08|9.5e-01|2.0e-
02| chol 3 3
11|0.327|0.327|3.9e-02|4.1e+01|4.0e+08| 1.881492e+07| 0:0:00|1.8e+08|8.7e-01|1.6e-
02| chol 3 4
12|0.831|0.831|1.1e-02|1.1e+01|1.2e+08| 1.521778e+07| 0:0:00|1.4e+07|9.5e-01|4.8e-
03| chol 4 4
13|0.798|0.798|4.9e-03|5.0e+00|5.0e+07| 1.029536e+07| 0:0:00|8.7e+05|1.1e+00|2.5e-
03| chol 4 5

```



```
14|0.778|0.778|2.0e-03|2.0e+00|1.8e+07| 5.412643e+06| 0:0:00|4.9e+04|1.3e+00|1.2e-✓  
03| chol 4 6  
15|0.744|0.744|1.2e-03|1.2e+00|1.0e+07| 3.502324e+06| 0:0:00|2.8e+04|1.5e+00|7.6e-✓  
04| chol 4 4  
16|1.000|1.000|7.2e-04|7.0e-01|6.3e+06| 2.257955e+06| 0:0:00|1.5e+04|1.5e+00|4.8e-✓  
04| chol 4 5  
17|1.000|1.000|3.2e-04|3.1e-01|2.6e+06| 9.624243e+05| 0:0:00|9.6e+03|1.6e+00|2.3e-✓  
04| chol 4 4  
18|1.000|1.000|2.2e-04|1.6e-01|1.3e+06| 4.527361e+05| 0:0:00|4.6e+03|1.6e+00|1.2e-✓  
04| chol 4 4  
19|1.000|1.000|2.4e-04|7.1e-02|5.5e+05| 1.772033e+05| 0:0:00|2.3e+03|1.7e+00|5.3e-✓  
05| chol 4 4  
20|0.855|0.855|2.6e-04|2.5e-02|1.7e+05| 5.361937e+04| 0:0:00|1.1e+03|1.7e+00|1.9e-✓  
05| chol 3 3  
21|0.435|0.435|1.8e-04|2.1e-02|1.4e+05| 3.898863e+04| 0:0:00|7.5e+02|1.8e+00|1.7e-✓  
05| chol 4 3  
22|1.000|1.000|1.6e-04|1.2e-02|8.0e+04| 2.519115e+04| 0:0:00|2.7e+02|1.8e+00|9.6e-✓  
06| chol 3 3  
23|0.956|0.956|9.5e-05|7.0e-03|4.3e+04| 1.220623e+04| 0:0:00|1.6e+02|1.8e+00|5.7e-✓  
06| chol 3 3  
24|1.000|1.000|7.5e-05|4.0e-03|2.3e+04| 6.684963e+03| 0:0:00|8.5e+01|1.9e+00|3.4e-✓  
06| chol 3 3  
25|1.000|1.000|6.3e-05|1.9e-03|8.9e+03| 2.559389e+03| 0:0:00|4.6e+01|1.9e+00|1.7e-✓  
06| chol 3 3  
26|1.000|1.000|5.4e-05|1.0e-03|3.7e+03| 1.038254e+03| 0:0:00|1.8e+01|1.9e+00|9.1e-✓  
07| chol 2 2  
27|1.000|1.000|4.3e-05|5.9e-04|1.5e+03| 4.306182e+02| 0:0:00|7.7e+00|2.0e+00|5.2e-✓  
07| chol 2 2  
28|1.000|1.000|3.5e-05|3.5e-04|6.5e+02| 1.734691e+02| 0:0:00|3.2e+00|2.0e+00|3.1e-✓  
07| chol 2 2  
29|1.000|1.000|3.0e-05|2.2e-04|2.8e+02| 7.697404e+01| 0:0:00|1.4e+00|2.0e+00|2.0e-✓  
07| chol 2 2  
30|1.000|1.000|2.5e-05|1.5e-04|1.2e+02| 1.726481e+01| 0:0:00|6.0e-01|2.0e+00|1.3e-✓  
07| chol 3 2  
31|1.000|1.000|2.3e-05|1.1e-04|5.7e+01| 1.362208e+01| 0:0:00|2.7e-01|2.0e+00|1.0e-✓  
07| chol 2 2  
32|0.620|0.620|2.0e-05|9.4e-05|4.4e+01|-1.844451e+01| 0:0:00|1.8e-01|2.0e+00|8.4e-✓  
08| chol 2 3  
33|0.954|0.954|1.9e-05|7.9e-05|2.6e+01| 1.791524e+00| 0:0:00|1.0e-01|2.0e+00|7.1e-✓  
08| chol 2 2  
34|0.526|0.526|1.7e-05|6.9e-05|2.2e+01|-1.859651e+01| 0:0:00|7.8e-02|2.0e+00|6.1e-✓  
08| chol 2 2  
35|0.928|0.928|1.7e-05|6.0e-05|1.4e+01|-3.508614e+00| 0:0:00|5.0e-02|2.0e+00|5.3e-✓  
08| chol 2 2  
36|0.424|0.424|1.5e-05|5.3e-05|1.3e+01|-1.854822e+01| 0:0:00|4.2e-02|2.0e+00|4.7e-✓  
08| chol 2 2  
37|0.913|0.913|1.5e-05|4.7e-05|9.3e+00|-5.784213e+00| 0:0:00|3.0e-02|2.0e+00|4.1e-✓  
08| chol 2 2  
38|0.388|0.388|1.3e-05|4.1e-05|9.1e+00|-1.799818e+01| 0:0:00|2.6e-02|2.0e+00|3.6e-✓  
08| chol 2 2  
39|0.883|0.883|1.3e-05|3.7e-05|6.6e+00|-7.877863e+00| 0:0:01|2.1e-02|2.0e+00|3.3e-✓  
08| chol 2 2  
40|0.488|0.488|1.2e-05|3.2e-05|6.2e+00|-1.600792e+01| 0:0:01|1.8e-02|2.0e+00|2.8e-✓  
08| chol 2 2
```

```

41|0.853|0.853|1.1e-05|2.8e-05|4.3e+00|-9.720242e+00| 0:0:01|1.4e-02|2.0e+00|2.5e-✓
08| chol 2 2
42|0.648|0.648|1.0e-05|2.5e-05|3.6e+00|-1.375281e+01| 0:0:01|1.1e-02|2.0e+00|2.2e-✓
08| chol 2 2
43|0.845|0.845|1.0e-05|2.2e-05|2.5e+00|-1.058248e+01| 0:0:01|8.4e-03|2.0e+00|2.0e-✓
08| chol 2 2
44|0.420|0.420|9.3e-06|2.0e-05|2.5e+00|-1.409786e+01| 0:0:01|7.2e-03|2.0e+00|1.8e-✓
08| chol 2 2
45|0.375|0.375|9.2e-06|1.9e-05|2.5e+00|-1.263937e+01| 0:0:01|6.6e-03|2.0e+00|1.7e-✓
08| chol 4 2
46|0.368|0.368|9.1e-06|1.8e-05|2.6e+00|-1.190261e+01| 0:0:01|6.2e-03|2.0e+00|1.6e-✓
08| chol 2 2
47|0.362|0.362|9.0e-06|1.8e-05|2.5e+00|-1.175810e+01| 0:0:01|6.0e-03|2.0e+00|1.6e-✓
08| chol 2 2
48|0.388|0.388|8.9e-06|1.7e-05|2.4e+00|-1.168040e+01| 0:0:01|5.8e-03|2.0e+00|1.5e-✓
08| chol 3 2
49|0.315|0.315|8.9e-06|1.7e-05|2.5e+00|-1.167185e+01| 0:0:01|5.7e-03|2.0e+00|1.5e-✓
08| chol 2 2
50|0.112|0.112|8.9e-06|1.7e-05|2.7e+00|-1.166470e+01| 0:0:01|5.6e-03|2.0e+00|1.5e-✓
08|

```

Stop: maximum number of iterations reached

```

-----
number of iterations    = 50
primal objective value =  4.46824704e+01
dual   objective value = -6.80118653e+01
gap := trace(XZ)       = 2.67e+00
relative gap           = 4.66e-02
actual relative gap    = 9.91e-01
rel. primal infeas     = 8.90e-06
rel. dual   infeas     = 1.67e-05
norm(X), norm(y), norm(Z) = 8.3e+04, 1.6e+02, 1.4e+02
norm(A), norm(b), norm(C) = 2.5e+05, 4.0e+05, 7.6e+01
Total CPU time (secs)   = 0.67
CPU time per iteration = 0.01
termination code        = -6
DIMACS errors: 8.9e-06  0.0e+00  1.7e-05  0.0e+00  9.9e-01  2.4e-02
-----

```

ans =

67.9464

Iteration 7 Total error is: 0.015442

```

num. of constraints = 85
dim. of socp var   = 86,   num. of socp blk = 1
dim. of linear var = 800
dim. of free var   = 10
*** 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|2.1e+03|1.4e+10| 1.353686e+07| 0:0:00|1.4e+10|1.0e+00|1.✓
0e+00| chol 1  1
1|0.000|0.000|2.1e+00|2.1e+03|1.4e+10| 1.353580e+07| 0:0:00|1.4e+10|1.0e+00|1.✓
0e+00| chol 1  1
2|0.000|0.000|2.1e+00|2.1e+03|1.4e+10| 1.354067e+07| 0:0:00|1.4e+10|1.0e+00|1.✓
0e+00| chol 1  2
3|0.000|0.000|2.1e+00|2.1e+03|1.4e+10| 1.354392e+07| 0:0:00|1.4e+10|1.0e+00|1.✓
0e+00| chol 1  1
4|0.015|0.015|2.1e+00|2.1e+03|1.4e+10| 1.356447e+07| 0:0:00|1.3e+10|1.0e+00|9.9e-✓
01| chol 1  2
5|0.046|0.046|2.0e+00|2.0e+03|1.3e+10| 1.361007e+07| 0:0:00|1.3e+10|1.0e+00|9.4e-✓
01| chol 2  2
6|0.402|0.402|1.2e+00|1.2e+03|7.9e+09| 1.362986e+07| 0:0:00|7.7e+09|1.0e+00|5.7e-✓
01| chol 2  2
7|0.719|0.719|3.4e-01|3.4e+02|2.2e+09| 1.352658e+07| 0:0:00|2.2e+09|1.0e+00|1.6e-✓
01| chol 2  2
8|0.861|0.861|4.8e-02|4.7e+01|3.2e+08| 1.293455e+07| 0:0:00|2.6e+08|1.0e+00|2.3e-✓
02| chol 2  4
9|0.044|0.044|4.8e-02|4.7e+01|3.3e+08| 1.333831e+07| 0:0:00|2.5e+08|1.0e+00|2.3e-✓
02| chol 3  4
10|0.206|0.206|4.4e-02|4.3e+01|3.4e+08| 1.455247e+07| 0:0:00|2.1e+08|9.5e-01|2.0e-✓
02| chol 3  3
11|0.328|0.328|3.9e-02|3.9e+01|3.6e+08| 1.701940e+07| 0:0:00|1.6e+08|8.7e-01|1.6e-✓
02| chol 3  4
12|0.833|0.833|1.1e-02|1.1e+01|1.0e+08| 1.369852e+07| 0:0:00|1.2e+07|9.5e-01|4.8e-✓
03| chol 4  4
13|0.792|0.792|4.8e-03|4.7e+00|4.3e+07| 9.123529e+06| 0:0:00|7.3e+05|1.1e+00|2.4e-✓
03| chol 6  4
14|0.786|0.786|2.0e-03|1.9e+00|1.6e+07| 4.813758e+06| 0:0:00|4.1e+04|1.3e+00|1.2e-✓
03| chol 4  5
15|0.778|0.778|1.2e-03|1.1e+00|9.5e+06| 3.224657e+06| 0:0:00|2.4e+04|1.4e+00|7.6e-✓
04| chol 4  4
16|1.000|1.000|6.9e-04|6.6e-01|5.6e+06| 2.010304e+06| 0:0:00|1.4e+04|1.5e+00|4.8e-✓
04| chol 4  4
17|1.000|1.000|3.1e-04|2.8e-01|2.2e+06| 8.045102e+05| 0:0:00|8.5e+03|1.6e+00|2.1e-✓
04| chol 4  4
18|1.000|1.000|2.4e-04|1.4e-01|1.1e+06| 3.851155e+05| 0:0:00|3.8e+03|1.7e+00|1.1e-✓
04| chol 4  4
19|1.000|1.000|2.3e-04|7.2e-02|5.3e+05| 1.729704e+05| 0:0:00|2.0e+03|1.7e+00|5.6e-✓
05| chol 4  6
20|0.934|0.934|2.8e-04|2.3e-02|1.4e+05| 4.249854e+04| 0:0:00|1.0e+03|1.7e+00|1.8e-✓
05| chol 3  3
21|0.483|0.483|1.9e-04|1.9e-02|1.2e+05| 3.035522e+04| 0:0:00|6.1e+02|1.8e+00|1.6e-✓
05| chol 4  3
22|0.976|0.976|1.5e-04|1.1e-02|6.4e+04| 2.011544e+04| 0:0:00|2.3e+02|1.8e+00|9.0e-✓
06| chol 3  3
23|1.000|1.000|9.2e-05|5.8e-03|3.3e+04| 8.999170e+03| 0:0:00|1.2e+02|1.8e+00|5.1e-✓
06| chol 3  3
24|1.000|1.000|7.6e-05|3.3e-03|1.7e+04| 4.879715e+03| 0:0:00|6.4e+01|1.9e+00|2.9e-✓

```

```

06| chol 3 3
25|1.000|1.000|6.4e-05|1.6e-03|6.8e+03| 1.865134e+03| 0:0:00|3.3e+01|1.9e+00|1.5e-✓
06| chol 2 2
26|1.000|1.000|4.9e-05|8.5e-04|2.9e+03| 8.688154e+02| 0:0:00|1.4e+01|1.9e+00|7.8e-✓
07| chol 2 2
27|1.000|1.000|3.7e-05|4.5e-04|1.3e+03| 2.903313e+02| 0:0:00|6.0e+00|2.0e+00|4.2e-✓
07| chol 2 2
28|1.000|1.000|3.2e-05|2.6e-04|5.7e+02| 1.987887e+02| 0:0:00|2.7e+00|2.0e+00|2.4e-✓
07| chol 2 2
29|0.820|0.820|2.3e-05|1.6e-04|3.4e+02| 3.070480e+01| 0:0:00|1.5e+00|2.0e+00|1.5e-✓
07| chol 2 2
30|1.000|1.000|2.1e-05|1.0e-04|1.8e+02| 6.256334e+01| 0:0:00|7.4e-01|2.0e+00|9.6e-✓
08| chol 2 2
31|0.693|0.693|1.5e-05|6.8e-05|1.2e+02|-2.498446e+00| 0:0:00|4.9e-01|2.0e+00|6.3e-✓
08| chol 2 2
32|0.970|0.970|1.4e-05|4.4e-05|7.1e+01| 2.093897e+01| 0:0:00|2.8e-01|2.0e+00|4.0e-✓
08| chol 2 2
33|0.591|0.591|9.5e-06|3.0e-05|5.6e+01|-1.024945e+01| 0:0:00|2.1e-01|2.0e+00|2.7e-✓
08| chol 2 2
34|0.978|0.978|8.9e-06|2.1e-05|3.2e+01| 3.218433e+00| 0:0:00|1.2e-01|2.0e+00|1.8e-✓
08| chol 2 2
35|0.618|0.618|6.2e-06|1.5e-05|2.4e+01|-1.068222e+01| 0:0:00|9.1e-02|2.0e+00|1.2e-✓
08| chol 2 2
36|0.972|0.972|6.0e-06|1.1e-05|1.4e+01|-5.346609e+00| 0:0:00|5.4e-02|2.0e+00|8.0e-✓
09| chol 2 2
37|0.595|0.595|4.2e-06|8.4e-06|1.1e+01|-1.150844e+01| 0:0:01|4.0e-02|2.0e+00|5.4e-✓
09| chol 2 2
38|1.000|1.000|4.1e-06|6.5e-06|5.9e+00|-9.462068e+00| 0:0:01|2.4e-02|2.0e+00|3.8e-✓
09| chol 2 2
39|0.650|0.650|3.1e-06|5.6e-06|4.2e+00|-1.195956e+01| 0:0:01|1.7e-02|2.0e+00|2.6e-✓
09| chol 2 3
40|0.954|0.954|3.0e-06|4.6e-06|2.3e+00|-1.146774e+01| 0:0:01|9.5e-03|2.0e+00|2.0e-✓
09| chol 2 2
41|0.845|0.845|2.6e-06|4.1e-06|1.2e+00|-1.235184e+01| 0:0:01|5.7e-03|2.0e+00|1.5e-✓
09| chol 2 2
42|0.995|0.995|2.5e-06|3.6e-06|5.8e-01|-1.239304e+01| 0:0:01|2.6e-03|2.0e+00|1.3e-✓
09| chol 2 2
43|0.535|0.535|2.3e-06|3.4e-06|4.9e-01|-1.270986e+01| 0:0:01|1.9e-03|2.0e+00|1.1e-✓
09| chol 2 2
44|0.847|0.847|2.3e-06|3.0e-06|3.4e-01|-1.265967e+01| 0:0:01|1.2e-03|2.0e+00|1.0e-✓
09| chol 2 2
45|0.175|0.175|2.2e-06|2.6e-06|3.9e-01|-1.280306e+01| 0:0:01|1.1e-03|2.0e+00|1.0e-✓
09| chol 2 2
46|0.107|0.107|2.2e-06|2.5e-06|4.4e-01|-1.284764e+01| 0:0:01|1.1e-03|2.0e+00|9.8e-✓
10| chol 2 2
47|0.181|0.181|2.2e-06|2.2e-06|4.8e-01|-1.289342e+01| 0:0:01|1.1e-03|2.0e+00|9.6e-✓
10| chol 2 2
48|0.152|0.152|2.2e-06|2.1e-06|5.3e-01|-1.293987e+01| 0:0:01|1.1e-03|2.0e+00|9.3e-✓
10| chol 2 2
49|0.218|0.218|2.1e-06|1.9e-06|5.7e-01|-1.302836e+01| 0:0:01|1.1e-03|2.0e+00|8.8e-✓
10| chol 2 2
50|0.100|0.100|2.0e-06|1.8e-06|6.6e-01|-1.316692e+01| 0:0:01|1.1e-03|2.0e+00|8.3e-✓
10|

```

Stop: maximum number of iterations reached

```
-----  
number of iterations    = 50  
primal objective value = -1.04043703e+01  
dual   objective value = -1.59294730e+01  
gap := trace(XZ)       = 6.63e-01  
relative gap           = 4.68e-02  
actual relative gap    = 2.02e-01  
rel. primal infeas     = 2.04e-06  
rel. dual   infeas     = 1.80e-06  
norm(X), norm(y), norm(Z) = 5.5e+04, 9.4e+01, 6.3e+01  
norm(A), norm(b), norm(C) = 2.4e+05, 3.6e+05, 7.6e+01  
Total CPU time (secs)   = 0.66  
CPU time per iteration = 0.01  
termination code        = -6  
DIMACS errors: 2.0e-06  0.0e+00  1.8e-06  0.0e+00  2.0e-01  2.4e-02  
-----
```

ans =

15.9045

Iteration 8 Total error is: 0.014597

The total representation error of the testing signals is: 0.025292

>>