**Note that code is in brown color!!**

**>> mu = mean(data); % mean vector**

**C = cov(data); %covariance matrix**

**>> % choice of alpha is 0.90 to 0.99, I will be taking 3 values 0.9, 0.95, 0.99**

**%choice of d is taken close to 1%(1 percent) i.e. maximum loss i am willing to take is 1% of the fortune i am spending on**

**>> %i am spending on portfolio i.e. if i spend 1000 rs on portfolio, i won’t tolerate a loss of more than 10 rs**

>> %convex opt problem

alpha = 0.9

d =0.01

mu= mu'% dimension adjustment

cvx\_begin

variables W(54,1)

maximize (W'\*mu)

W'\*ones(54,1)==1%constraint 1

for i =1:54

W(i,1)>=0;%short selling not allowed

end

norminv(alpha)\*norm(sqrtm(C)\*W) - W'\*mu <= d %constraint 3

cvx\_end

alpha =

0.9000

d =

0.0100

mu =

14.4593

-3.9145

0.9661

2.6378

-2.0989

17.1986

10.5014

6.7385

-7.6643

-10.1924

-15.5689

16.6386

-4.9025

10.1328

-5.9525

2.9817

8.4640

1.7053

17.4044

21.3157

15.5065

-5.4305

8.2863

-4.4287

-14.6776

19.3936

14.2592

-2.3712

-4.1800

8.7976

-4.3130

-3.8174

0.7897

0.5691

-9.9637

6.1771

-9.0792

-17.1986

-0.0745

10.0233

7.7013

-2.6018

1.8032

-12.6324

21.1485

6.3430

-5.3368

-19.3861

3.3422

10.3488

12.6183

7.9076

5.7772

-5.5874

Calling SDPT3 4.0: 111 variables, 55 equality constraints

For improved efficiency, SDPT3 is solving the dual problem.

------------------------------------------------------------

num. of constraints = 55

dim. of socp var = 55, num. of socp blk = 1

dim. of linear var = 55

dim. of free var = 1 \*\*\* convert ublk to lblk

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

SDPT3: Infeasible path-following algorithms

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

version predcorr gam expon scale\_data

NT 1 0.000 1 0

it pstep dstep pinfeas dinfeas gap prim-obj dual-obj cputime

-------------------------------------------------------------------

0|0.000|0.000|1.2e+01|3.3e+01|4.6e+04| 6.969540e-02 0.000000e+00| 0:0:00| chol 1 1

1|0.723|0.528|3.4e+00|1.6e+01|2.6e+04| 6.986215e+01 4.930076e+01| 0:0:00| chol 1 1

2|0.731|0.795|9.2e-01|3.3e+00|6.0e+03| 1.006455e+02 1.570221e+02| 0:0:00| chol 1 1

3|1.000|0.767|4.1e-07|7.9e-01|1.4e+03| 1.046929e+02 4.478953e+01| 0:0:00| chol 1 1

4|1.000|0.604|1.5e-07|3.2e-01|6.8e+02| 1.028925e+02 2.084018e+01| 0:0:00| chol 1 1

5|1.000|0.720|2.7e-08|9.0e-02|2.2e+02| 7.613449e+01 1.243270e+01| 0:0:00| chol 1 1

6|0.747|0.889|7.0e-09|1.1e-02|5.3e+01| 5.058652e+01 1.132158e+01| 0:0:00| chol 1 1

7|0.926|0.161|2.7e-09|9.0e-03|1.7e+01| 2.466689e+01 1.151007e+01| 0:0:00| chol 1 1

8|0.560|0.804|8.7e-09|1.8e-03|6.6e+00| 2.276529e+01 1.681861e+01| 0:0:00| chol 1 1

9|0.911|0.574|3.6e-09|7.6e-04|3.1e+00| 2.190113e+01 1.908515e+01| 0:0:00| chol 1 1

10|0.690|0.514|3.5e-09|3.7e-04|1.7e+00| 2.148162e+01 1.990943e+01| 0:0:00| chol 1 1

11|0.930|0.460|8.8e-10|2.0e-04|8.6e-01| 2.126862e+01 2.047300e+01| 0:0:00| chol 1 1

12|1.000|0.754|1.2e-09|4.9e-05|2.4e-01| 2.124743e+01 2.102559e+01| 0:0:00| chol 1 1

13|0.983|0.975|5.2e-11|1.2e-06|5.9e-03| 2.124175e+01 2.123624e+01| 0:0:00| chol 1 1

14|0.988|0.986|1.1e-11|1.1e-05|1.1e-04| 2.124163e+01 2.124156e+01| 0:0:00| chol 1 1

15|0.987|0.974|4.4e-13|2.1e-07|2.7e-06| 2.124163e+01 2.124163e+01| 0:0:00| chol 1 1

16|1.000|0.981|4.0e-15|5.0e-09|1.7e-07| 2.124163e+01 2.124163e+01| 0:0:00|

stop: max(relative gap, infeasibilities) < 1.49e-08

-------------------------------------------------------------------

number of iterations = 16

primal objective value = 2.12416304e+01

dual objective value = 2.12416302e+01

gap := trace(XZ) = 1.71e-07

relative gap = 3.94e-09

actual relative gap = 3.64e-09

rel. primal infeas (scaled problem) = 3.98e-15

rel. dual " " " = 4.96e-09

rel. primal infeas (unscaled problem) = 0.00e+00

rel. dual " " " = 0.00e+00

norm(X), norm(y), norm(Z) = 1.6e+02, 7.1e-01, 2.3e+01

norm(A), norm(b), norm(C) = 1.0e+02, 7.7e+01, 2.4e+00

Total CPU time (secs) = 0.43

CPU time per iteration = 0.03

termination code = 0

DIMACS: 1.4e-14 0.0e+00 6.0e-09 0.0e+00 3.6e-09 3.9e-09

-------------------------------------------------------------------

------------------------------------------------------------

Status: Solved

Optimal value (cvx\_optval): +21.2416

Weight value:

|  |
| --- |
| 4.04278412334132e-10  1.09558339539349e-10  1.36220901714017e-10  1.51563893251114e-10  1.15482849739280e-10  6.96999876352128e-10  2.64818222059074e-10  1.97445317104767e-10  9.54668826758100e-11  8.84062403778395e-11  7.38104018044322e-11  6.34135241338670e-10  1.05388224085600e-10  2.53744187557728e-10  1.00212580847621e-10  1.54312628995593e-10  2.18487885506518e-10  1.40754621533974e-10  7.01620776355453e-10  0.557111551992392  5.34727981296117e-10  1.03119923348877e-10  2.14835056551626e-10  1.06714135478381e-10  7.55525255485692e-11  2.19407759345305e-09  4.29966577178494e-10  1.21607475295216e-10  1.08332811538676e-10  2.27579089759587e-10  1.08682726950628e-10  1.13395475215674e-10  1.37636185427203e-10  1.35243845089969e-10  8.88213624172128e-11  1.89968029358673e-10  9.00851043499358e-11  7.08151486157270e-11  1.31385565241233e-10  2.51519274493922e-10  2.07358807517841e-10  1.17522548187314e-10  1.44725301544816e-10  8.01448615584052e-11  0.442888435688310  1.88787135348707e-10  1.05729095000270e-10  6.62902015467582e-11  1.54931826662282e-10  2.60341620403218e-10  3.16788983300828e-10  2.22065538024075e-10  1.79359628029606e-10  1.01752501708416e-10 |

>> alpha = 0.95;

d =0.01;

%mu= mu'% dimension adjustment

cvx\_begin

variables W(54,1)

maximize (W'\*mu)

W'\*ones(54,1)==1%constraint 1

for i =1:54

W(i,1)>=0;%short selling not allowed

end

norminv(alpha)\*norm(sqrtm(C)\*W) - W'\*mu <= d %constraint 3

cvx\_end

Calling SDPT3 4.0: 111 variables, 55 equality constraints

For improved efficiency, SDPT3 is solving the dual problem.

------------------------------------------------------------

num. of constraints = 55

dim. of socp var = 55, num. of socp blk = 1

dim. of linear var = 55

dim. of free var = 1 \*\*\* convert ublk to lblk

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

SDPT3: Infeasible path-following algorithms

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

version predcorr gam expon scale\_data

NT 1 0.000 1 0

it pstep dstep pinfeas dinfeas gap prim-obj dual-obj cputime

-------------------------------------------------------------------

0|0.000|0.000|1.2e+01|3.3e+01|4.6e+04| 6.645341e-02 0.000000e+00| 0:0:00| chol 1 1

1|0.740|0.532|3.1e+00|1.6e+01|2.6e+04| 7.051845e+01 5.445699e+01| 0:0:00| chol 1 1

2|0.878|0.808|3.8e-01|3.0e+00|5.6e+03| 1.022811e+02 1.515310e+02| 0:0:00| chol 1 1

3|1.000|0.744|4.5e-07|8.0e-01|1.6e+03| 1.029605e+02 4.207063e+01| 0:0:00| chol 1 1

4|1.000|0.640|2.4e-07|2.9e-01|6.8e+02| 9.541223e+01 1.810783e+01| 0:0:00| chol 1 1

5|1.000|0.730|6.8e-09|8.1e-02|2.2e+02| 5.649752e+01 1.210828e+01| 0:0:00| chol 1 1

6|0.711|0.801|3.8e-09|1.7e-02|6.8e+01| 4.914248e+01 1.358671e+01| 0:0:00| chol 1 1

7|1.000|0.551|6.9e-09|7.6e-03|2.2e+01| 2.920354e+01 1.419011e+01| 0:0:00| chol 1 1

8|1.000|0.278|3.3e-09|5.5e-03|9.0e+00| 2.145438e+01 1.474907e+01| 0:0:00| chol 1 1

9|0.505|0.688|6.4e-09|1.7e-03|3.7e+00| 2.089322e+01 1.779901e+01| 0:0:00| chol 1 1

10|1.000|0.475|5.4e-10|9.0e-04|1.9e+00| 2.034272e+01 1.878518e+01| 0:0:00| chol 1 1

11|1.000|0.626|5.7e-10|3.4e-04|8.0e-01| 2.020144e+01 1.951366e+01| 0:0:00| chol 1 1

12|0.977|0.828|9.3e-11|5.8e-05|1.4e-01| 2.015338e+01 2.003417e+01| 0:0:00| chol 1 1

13|0.981|0.968|4.7e-11|1.9e-06|4.6e-03| 2.015032e+01 2.014636e+01| 0:0:00| chol 1 1

14|0.985|0.988|1.8e-11|8.5e-06|7.8e-05| 2.015024e+01 2.015019e+01| 0:0:00| chol 1 1

15|1.000|0.987|2.6e-12|1.4e-07|2.4e-06| 2.015023e+01 2.015023e+01| 0:0:00| chol 1 1

16|1.000|0.979|1.4e-11|4.6e-09|2.0e-07| 2.015023e+01 2.015023e+01| 0:0:00|

stop: max(relative gap, infeasibilities) < 1.49e-08

-------------------------------------------------------------------

number of iterations = 16

primal objective value = 2.01502342e+01

dual objective value = 2.01502340e+01

gap := trace(XZ) = 1.95e-07

relative gap = 4.73e-09

actual relative gap = 4.47e-09

rel. primal infeas (scaled problem) = 1.39e-11

rel. dual " " " = 4.57e-09

rel. primal infeas (unscaled problem) = 0.00e+00

rel. dual " " " = 0.00e+00

norm(X), norm(y), norm(Z) = 1.7e+02, 6.8e-01, 1.7e+01

norm(A), norm(b), norm(C) = 9.5e+01, 7.7e+01, 2.4e+00

Total CPU time (secs) = 0.16

CPU time per iteration = 0.01

termination code = 0

DIMACS: 4.8e-11 0.0e+00 5.5e-09 0.0e+00 4.5e-09 4.7e-09

-------------------------------------------------------------------

------------------------------------------------------------

Status: Solved

Optimal value (cvx\_optval): +20.1502

Weight value:

|  |
| --- |
| 3.63211115859984e-10  1.24665086739235e-10  1.50232646987832e-10  1.77343301543808e-10  1.17125230660706e-10  9.11417908968353e-10  3.01673543013852e-10  2.38265245946053e-10  1.10452641836744e-10  1.05390631502704e-10  8.44721292700072e-11  7.63880845968215e-10  1.19704812600507e-10  2.82252984056575e-10  1.09405997303283e-10  1.80004441714857e-10  2.39188705225304e-10  1.50834678694155e-10  6.27414100603768e-10  0.0627346926400614  8.25074778615970e-10  1.16912763477984e-10  2.29693729680872e-10  1.18224369845389e-10  8.52492514593026e-11  0.574808307316266  5.77670507778263e-10  1.53235508916734e-10  1.22232804103284e-10  2.60664591477684e-10  1.25431154132128e-10  1.39689707007022e-10  1.62967066921095e-10  1.55177809702028e-10  1.04277985366017e-10  2.29581660473933e-10  1.00439176424445e-10  8.20309554065326e-11  1.53104563885158e-10  2.78108791007589e-10  3.01470002330515e-10  1.39206163842150e-10  1.69061585006726e-10  8.98682088128122e-11  0.362456988237666  2.15727663105439e-10  1.26897665063159e-10  7.44183724511056e-11  1.75737813301647e-10  2.95288096968866e-10  2.98433088428279e-10  2.94285944485487e-10  1.94139677155813e-10  1.11448067556209e-10 |

>> alpha = 0.99;

d =0.01;

%mu= mu'% dimension adjustment

cvx\_begin

variables W(54,1)

maximize (W'\*mu)

W'\*ones(54,1)==1%constraint 1

for i =1:54

W(i,1)>=0;%short selling not allowed

end

norminv(alpha)\*norm(sqrtm(C)\*W) - W'\*mu <= d %constraint 3

cvx\_end

Calling SDPT3 4.0: 111 variables, 55 equality constraints

For improved efficiency, SDPT3 is solving the dual problem.

------------------------------------------------------------

num. of constraints = 55

dim. of socp var = 55, num. of socp blk = 1

dim. of linear var = 55

dim. of free var = 1 \*\*\* convert ublk to lblk

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

SDPT3: Infeasible path-following algorithms

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

version predcorr gam expon scale\_data

NT 1 0.000 1 0

it pstep dstep pinfeas dinfeas gap prim-obj dual-obj cputime

-------------------------------------------------------------------

0|0.000|0.000|1.2e+01|3.3e+01|4.6e+04| 6.033438e-02 0.000000e+00| 0:0:00| chol 1 1

1|0.768|0.539|2.7e+00|1.5e+01|2.6e+04| 7.148923e+01 6.383417e+01| 0:0:00| chol 1 1

2|1.000|0.835|1.2e-06|2.6e+00|4.7e+03| 9.810473e+01 1.198652e+02| 0:0:00| chol 1 1

3|1.000|0.825|4.4e-07|4.7e-01|9.2e+02| 8.634129e+01 2.339128e+01| 0:0:00| chol 1 1

4|1.000|0.701|2.3e-07|1.5e-01|3.4e+02| 2.931296e+01 1.038962e+01| 0:0:00| chol 1 1

5|0.653|0.337|7.6e-08|9.8e-02|2.6e+02|-5.049425e+00 1.023148e+01| 0:0:00| chol 1 1

6|1.000|0.382|1.4e-09|6.1e-02|2.1e+02|-2.700057e+01 9.396250e+00| 0:0:00| chol 1 1

7|1.000|0.519|4.3e-09|2.9e-02|1.3e+02|-6.629992e+01 1.001731e+01| 0:0:00| chol 1 1

8|1.000|0.206|5.2e-10|2.3e-02|2.4e+02|-2.424305e+02 1.005286e+01| 0:0:00| chol 1 1

9|1.000|0.428|3.0e-09|1.3e-02|1.2e+02|-1.132702e+03 1.014189e+01| 0:0:00| chol 1 1

10|0.741|0.052|1.7e-07|1.3e-02|4.6e+03|-1.009491e+05 1.054321e+01| 0:0:00| chol 1 1

11|0.024|0.006|1.6e-07|1.3e-02|5.6e+04|-1.387973e+06 1.014003e+01| 0:0:00| chol 1 1

12|1.000|0.007|2.1e-05|1.3e-02|3.2e+07|-9.250773e+08 1.042848e+01| 0:0:00| chol 2 2

13|1.000|0.006|5.7e-03|1.3e-02|2.5e+10|-8.039229e+11 1.019456e+01| 0:0:00| chol 2 2

stop: primal infeas has deteriorated too much, 4.2e+01

14|1.000|0.005|5.7e-03|1.3e-02|2.5e+10|-8.039229e+11 1.019456e+01| 0:0:00|

prim\_inf,dual\_inf,relgap = 5.69e-03, 1.33e-02, 3.12e-02

sqlp stop: dual problem is suspected of being infeasible

-------------------------------------------------------------------

number of iterations = 14

residual of dual infeasibility

certificate X = 9.48e-11

reldist to infeas. <= 2.50e-14

Total CPU time (secs) = 0.11

CPU time per iteration = 0.01

termination code = 2

DIMACS: 2.0e-02 0.0e+00 1.6e-02 0.0e+00 -1.0e+00 3.1e-02

-------------------------------------------------------------------

------------------------------------------------------------

Status: Infeasible

Optimal value (cvx\_optval): -Inf

**NOTE THE INFEASIBILTY FOR ALPHA 0.99 AND D =0.01, SO WE INCREASE VALUE OF D**

>> alpha = 0.99;

d =0.1;

%mu= mu'% dimension adjustment

cvx\_begin

variables W(54,1)

maximize (W'\*mu)

W'\*ones(54,1)==1%constraint 1

for i =1:54

W(i,1)>=0;%short selling not allowed

end

norminv(alpha)\*norm(sqrtm(C)\*W) - W'\*mu <= d %constraint 3

cvx\_end

Calling SDPT3 4.0: 111 variables, 55 equality constraints

For improved efficiency, SDPT3 is solving the dual problem.

------------------------------------------------------------

num. of constraints = 55

dim. of socp var = 55, num. of socp blk = 1

dim. of linear var = 55

dim. of free var = 1 \*\*\* convert ublk to lblk

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

SDPT3: Infeasible path-following algorithms

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

version predcorr gam expon scale\_data

NT 1 0.000 1 0

it pstep dstep pinfeas dinfeas gap prim-obj dual-obj cputime

-------------------------------------------------------------------

0|0.000|0.000|1.2e+01|3.3e+01|4.6e+04| 6.033438e-01 0.000000e+00| 0:0:00| chol 1 1

1|0.768|0.539|2.7e+00|1.5e+01|2.6e+04| 7.167093e+01 6.378826e+01| 0:0:00| chol 1 1

2|1.000|0.835|1.2e-06|2.6e+00|4.7e+03| 9.826312e+01 1.198584e+02| 0:0:00| chol 1 1

3|1.000|0.826|4.4e-07|4.7e-01|9.1e+02| 8.658593e+01 2.335062e+01| 0:0:00| chol 1 1

4|1.000|0.702|2.2e-07|1.5e-01|3.4e+02| 3.041556e+01 1.031438e+01| 0:0:00| chol 1 1

5|0.656|0.350|7.5e-08|9.6e-02|2.5e+02|-3.467682e+00 1.014070e+01| 0:0:00| chol 1 1

6|1.000|0.378|1.4e-09|6.0e-02|2.0e+02|-2.430265e+01 9.322069e+00| 0:0:00| chol 1 1

7|1.000|0.520|4.2e-09|2.9e-02|1.2e+02|-6.003775e+01 9.912382e+00| 0:0:00| chol 1 1

8|1.000|0.210|5.0e-10|2.3e-02|2.3e+02|-2.123094e+02 9.944182e+00| 0:0:00| chol 1 1

9|1.000|0.442|2.5e-09|1.3e-02|1.0e+02|-9.409702e+02 1.003444e+01| 0:0:00| chol 1 1

10|0.735|0.057|1.6e-07|1.2e-02|3.3e+03|-7.791865e+04 1.042864e+01| 0:0:00| chol 1 1

11|0.025|0.006|1.3e-07|1.2e-02|4.6e+04|-1.211206e+06 1.002687e+01| 0:0:00| chol 1 2

12|1.000|0.006|4.8e-06|1.2e-02|3.0e+07|-8.986806e+08 1.031646e+01| 0:0:00| chol 2 2

13|1.000|0.006|1.9e-02|1.3e-02|2.6e+10|-8.515427e+11 1.008031e+01| 0:0:00| chol 2 2

stop: primal infeas has deteriorated too much, 9.3e+00

14|1.000|0.005|1.9e-02|1.3e-02|2.6e+10|-8.515427e+11 1.008031e+01| 0:0:00|

prim\_inf,dual\_inf,relgap = 1.92e-02, 1.26e-02, 3.02e-02

sqlp stop: dual problem is suspected of being infeasible

-------------------------------------------------------------------

number of iterations = 14

residual of dual infeasibility

certificate X = 8.95e-11

reldist to infeas. <= 2.25e-14

Total CPU time (secs) = 0.10

CPU time per iteration = 0.01

termination code = 2

DIMACS: 6.6e-02 0.0e+00 1.5e-02 0.0e+00 -1.0e+00 3.0e-02

-------------------------------------------------------------------

------------------------------------------------------------

Status: Infeasible

Optimal value (cvx\_optval): -Inf

**NOTE THE INFEASIBILTY FOR ALPHA 0.99 AND D =0.1, SO WE INCREASE VALUE OF D**

>> alpha = 0.99;

d =100;

%mu= mu'% dimension adjustment

cvx\_begin

variables W(54,1)

maximize (W'\*mu)

W'\*ones(54,1)==1%constraint 1

for i =1:54

W(i,1)>=0;%short selling not allowed

end

norminv(alpha)\*norm(sqrtm(C)\*W) - W'\*mu <= d %constraint 3

cvx\_end

Calling SDPT3 4.0: 111 variables, 55 equality constraints

For improved efficiency, SDPT3 is solving the dual problem.

------------------------------------------------------------

num. of constraints = 55

dim. of socp var = 55, num. of socp blk = 1

dim. of linear var = 55

dim. of free var = 1 \*\*\* convert ublk to lblk

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

SDPT3: Infeasible path-following algorithms

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

version predcorr gam expon scale\_data

NT 1 0.000 1 0

it pstep dstep pinfeas dinfeas gap prim-obj dual-obj cputime

-------------------------------------------------------------------

0|0.000|0.000|1.2e+01|1.7e+00|4.6e+04| 6.033438e+02 0.000000e+00| 0:0:00| chol 1 1

1|0.785|0.495|2.5e+00|8.8e-01|2.8e+04| 2.019313e+02 3.612113e+01| 0:0:00| chol 1 1

2|0.928|0.855|1.8e-01|1.4e-01|4.8e+03| 1.537362e+02 1.578897e+02| 0:0:00| chol 1 1

3|0.900|1.000|1.8e-02|4.7e-03|2.3e+02| 1.034922e+02 1.332865e+01| 0:0:00| chol 1 1

4|0.987|1.000|2.4e-04|1.7e-03|2.8e+01| 2.593291e+01 1.070236e+01| 0:0:00| chol 1 1

5|0.696|0.849|7.3e-05|4.3e-04|9.0e+00| 2.170970e+01 1.541963e+01| 0:0:00| chol 1 1

6|0.932|0.737|5.0e-06|1.4e-04|2.7e+00| 2.177324e+01 1.995905e+01| 0:0:00| chol 1 1

7|0.956|0.973|2.2e-07|6.0e-06|8.6e-02| 2.132774e+01 2.127817e+01| 0:0:00| chol 2 2

8|0.982|0.983|1.4e-08|2.7e-07|1.7e-03| 2.131588e+01 2.131585e+01| 0:0:00| chol 1 1

9|0.989|0.989|3.0e-09|1.7e-07|2.8e-05| 2.131566e+01 2.131566e+01| 0:0:00| chol 1 1

10|0.546|0.944|1.4e-09|2.9e-09|3.3e-06| 2.131566e+01 2.131566e+01| 0:0:00| chol 1 1

11|0.531|0.941|6.5e-10|3.4e-10|1.1e-06| 2.131566e+01 2.131566e+01| 0:0:00| chol 1 1

12|0.518|0.935|3.1e-10|1.2e-10|4.9e-07| 2.131566e+01 2.131566e+01| 0:0:00|

stop: max(relative gap, infeasibilities) < 1.49e-08

-------------------------------------------------------------------

number of iterations = 12

primal objective value = 2.13156629e+01

dual objective value = 2.13156625e+01

gap := trace(XZ) = 4.90e-07

relative gap = 1.12e-08

actual relative gap = 9.48e-09

rel. primal infeas (scaled problem) = 3.14e-10

rel. dual " " " = 1.15e-10

rel. primal infeas (unscaled problem) = 0.00e+00

rel. dual " " " = 0.00e+00

norm(X), norm(y), norm(Z) = 1.6e+02, 3.6e+01, 5.5e+01

norm(A), norm(b), norm(C) = 8.9e+01, 7.7e+01, 4.4e+01

Total CPU time (secs) = 0.11

CPU time per iteration = 0.01

termination code = 0

DIMACS: 1.1e-09 0.0e+00 1.2e-10 0.0e+00 9.5e-09 1.1e-08

-------------------------------------------------------------------

------------------------------------------------------------

Status: Solved

Optimal value (cvx\_optval): +21.3157

Weight value:

|  |
| --- |
| 4.51773065102474e-10  1.20359568166678e-10  1.50085206584438e-10  1.63592412624541e-10  1.30327893857510e-10  7.53191271596610e-10  2.84723776708239e-10  2.10407241895336e-10  1.04336534042876e-10  9.56086369470800e-11  8.13033254163178e-11  6.62069837396729e-10  1.15722427144856e-10  2.75521325266438e-10  1.11242637660166e-10  1.66708210572452e-10  2.39484646699248e-10  1.55940476442175e-10  7.94089560619326e-10  0.999999966376986  5.31304532332953e-10  1.13369795384093e-10  2.36202038673723e-10  1.17984287700322e-10  8.34365091684052e-11  1.60417878631106e-09  4.37438599564122e-10  1.28174127009221e-10  1.19078237654890e-10  2.45788504346809e-10  1.18415887134820e-10  1.20655194874743e-10  1.48526590413373e-10  1.47000603403379e-10  9.63959014487463e-11  2.02424862148590e-10  9.94390881953441e-11  7.77030262325878e-11  1.42476195587628e-10  2.72882441322848e-10  2.24894793660508e-10  1.27023529447773e-10  1.56447277402550e-10  8.86542055852627e-11  2.10453686693119e-08  2.04834056856176e-10  1.13640802766711e-10  7.34404637026861e-11  1.70082664568752e-10  2.80759937028674e-10  3.55686431631848e-10  2.28686010027354e-10  1.97541239745633e-10  1.12767208870266e-10 |