◻ برای اجرا کردن هر قست از سوال ها

دقیقاً بخش مورد نظر را uncomment کنید

(ضرورتی ها = پردازش آهسته + سوالاتی که نیاز به توضیح دارد)

```
                                1a,b,c.txt
-------------------------------------------problem
1-------------------------------------------
--------------------------------------------------------------------------------
--------------problem 1_a-------------------------------------------

Calling SDPT3 4.0: 4 variables, 2 equality constraints
------------------------------------------------------------

 num. of constraints =  2
 dim. of linear var  =  4
*********************************************************************
   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|1.8e+01|7.9e+00|4.0e+02| 2.000000e+01  0.000000e+00| 0:0:00| chol  1
1
 1|1.000|0.885|2.4e-06|9.8e-01|4.8e+01| 7.586767e+00 -1.015012e+00| 0:0:00| chol  1
1
 2|1.000|1.000|4.1e-06|8.3e-03|5.5e+00| 5.304837e+00  2.942602e-02| 0:0:00| chol  1
1
 3|0.899|1.000|4.9e-07|8.3e-04|5.5e-01| 5.926709e-01  4.476985e-02| 0:0:00| chol  1
1
 4|1.000|0.340|3.4e-08|5.8e-04|7.7e-01| 1.051697e+00  2.850351e-01| 0:0:00| chol  1
1
 5|0.952|1.000|1.8e-09|8.3e-06|4.0e-02| 3.480772e-01  3.083275e-01| 0:0:00| chol  1
1
 6|0.981|0.977|1.5e-10|1.0e-06|9.0e-04| 3.336816e-01  3.327802e-01| 0:0:00| chol  1
1
 7|0.989|0.989|4.0e-11|9.3e-08|1.0e-05| 3.333373e-01  3.333271e-01| 0:0:00| chol  1
1
 8|0.989|0.989|9.4e-12|1.0e-09|1.1e-07| 3.333334e-01  3.333333e-01| 0:0:00| chol  1
1
 9|0.999|0.995|5.6e-14|6.6e-12|1.6e-09| 3.333333e-01  3.333333e-01| 0:0:00|
  stop: max(relative gap, infeasibilities) < 1.49e-08
-------------------------------------------------------------------
 number of iterations   =  9
 primal objective value =  3.33333334e-01
 dual   objective value =  3.33333332e-01
 gap := trace(XZ)       = 1.57e-09
 relative gap           = 9.44e-10
 actual relative gap    = 9.41e-10
 rel. primal infeas (scaled problem)   = 5.55e-14
 rel. dual     "        "        "     = 6.59e-12
 rel. primal infeas (unscaled problem) = 0.00e+00
 rel. dual     "        "        "     = 0.00e+00
```

```
 norm(X), norm(y), norm(Z) = 4.7e-01, 3.3e-01, 7.5e-01
 norm(A), norm(b), norm(C) = 5.1e+00, 2.0e+00, 2.4e+00
 Total CPU time (secs)  = 0.30
 CPU time per iteration = 0.03
 termination code       =  0
 DIMACS: 5.6e-14  0.0e+00  8.0e-12  0.0e+00  9.4e-10  9.4e-10
-------------------------------------------------------------------

-------------------------------------------------------------
Status: Solved
Optimal value (cvx_optval): +0.333333


x1 =

   4.7511e-10


x2 =

    0.3333

######################################################################
######
--------------------------------------------------------------------------
----------problem 1_b----------------------------------------

Calling SDPT3 4.0: 10 variables, 5 equality constraints
-------------------------------------------------------------

 num. of constraints =  5
 dim. of socp   var  =  4,    num. of socp blk  =  2
 dim. of linear var  =  6
*******************************************************************
   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|1.0e+01|1.0e+01|6.1e+02| 1.141421e+01  0.000000e+00| 0:0:00| chol  1
1
 1|1.000|0.400|2.6e-06|6.2e+00|4.7e+02| 2.919771e+01 -3.589158e-01| 0:0:00| chol  1
1
 2|1.000|0.998|1.2e-05|2.5e-02|2.4e+01| 2.288067e+01  7.460857e-02| 0:0:00| chol  1
1
 3|0.984|1.000|4.9e-07|1.0e-03|5.2e-01| 6.039613e-01  8.170614e-02| 0:0:00| chol  1
1
```

```
 4|1.000|0.969|1.2e-07|1.3e-04|1.7e-01| 3.810841e-01  2.083304e-01| 0:0:00| chol  1
1
 5|0.976|0.871|3.9e-09|2.5e-05|1.0e-02| 2.557620e-01  2.454166e-01| 0:0:00| chol  1
1
 6|0.985|0.986|2.2e-10|1.3e-06|1.5e-04| 2.500863e-01  2.499340e-01| 0:0:00| chol  1
1
 7|0.989|0.989|5.9e-11|1.1e-07|1.7e-06| 2.500010e-01  2.499994e-01| 0:0:00| chol  1
1
 8|0.994|0.994|9.1e-13|7.1e-10|2.5e-08| 2.500000e-01  2.500000e-01| 0:0:00| chol  1
1
 9|0.996|0.995|9.7e-15|4.3e-12|3.2e-10| 2.500000e-01  2.500000e-01| 0:0:00|
  stop: max(relative gap, infeasibilities) < 1.49e-08
-----------------------------------------------------------------------
 number of iterations   =  9
 primal objective value =  2.50000000e-01
 dual   objective value =  2.50000000e-01
 gap := trace(XZ)       = 3.25e-10
 relative gap           = 2.16e-10
 actual relative gap    = 2.12e-10
 rel. primal infeas (scaled problem)  = 9.71e-15
 rel. dual      "          "          = 4.32e-12
 rel. primal infeas (unscaled problem) = 0.00e+00
 rel. dual      "          "          = 0.00e+00
 norm(X), norm(y), norm(Z) = 9.7e-01, 7.9e-01, 1.4e+00
 norm(A), norm(b), norm(C) = 6.0e+00, 2.0e+00, 2.4e+00
 Total CPU time (secs)  = 0.15
 CPU time per iteration = 0.02
 termination code       =  0
 DIMACS: 9.7e-15  0.0e+00  5.2e-12  0.0e+00  2.1e-10  2.2e-10
-----------------------------------------------------------------------

--------------------------------------------------------------
Status: Solved
Optimal value (cvx_optval): +0.25


x1 =

    0.2500


x2 =

    0.2500

#####################################################################################
######
-----------------------------------------------------------------------
```

```
----------problem 1_c-------------------------------------------

Calling SDPT3 4.0: 10 variables, 4 equality constraints
   For improved efficiency, SDPT3 is solving the dual problem.
   -----------------------------------------------------------

 num. of constraints =  4
 dim. of sdp    var  =  4,   num. of sdp  blk  =  2
 dim. of linear var  =  4
*********************************************************************
   SDPT3: Infeasible path-following algorithms
*********************************************************************
 version  predcorr  gam  expon  scale_data
   HKM       1     0.000   1       0
it pstep dstep pinfeas dinfeas gap      prim-obj       dual-obj      cputime
-------------------------------------------------------------------
 0|0.000|0.000|6.0e+00|1.1e+01|1.4e+03| 4.333333e+01  0.000000e+00| 0:0:00| chol  1
1
 1|0.940|0.820|3.6e-01|2.0e+00|2.0e+02| 2.846978e+01 -1.925310e+01| 0:0:00| chol  1
1
 2|1.000|1.000|5.6e-07|1.0e-02|2.7e+01| 1.389290e+01 -1.250249e+01| 0:0:00| chol  1
1
 3|1.000|1.000|3.6e-07|1.0e-03|1.2e+01| 6.258987e+00 -5.303076e+00| 0:0:00| chol  1
1
 4|0.930|0.930|5.3e-08|1.6e-04|1.0e+00| 2.366707e-01 -7.753547e-01| 0:0:00| chol  1
1
 5|0.997|0.940|1.1e-08|1.9e-05|1.1e-01|-4.373959e-01 -5.428644e-01| 0:0:00| chol  1
1
 6|0.985|0.983|7.7e-10|1.3e-06|1.7e-03|-4.990567e-01 -5.007362e-01| 0:0:00| chol  1
1
 7|0.987|0.987|1.6e-10|1.2e-07|2.2e-05|-4.999880e-01 -5.000086e-01| 0:0:00| chol  1
1
 8|0.980|0.979|2.8e-11|2.5e-09|4.5e-07|-4.999998e-01 -5.000002e-01| 0:0:00| chol  1
1
 9|1.000|1.000|3.9e-12|5.5e-12|3.7e-08|-5.000000e-01 -5.000000e-01| 0:0:00| chol  1
1
10|1.000|1.000|6.6e-11|1.0e-12|2.0e-09|-5.000000e-01 -5.000000e-01| 0:0:00|
  stop: max(relative gap, infeasibilities) < 1.49e-08
-------------------------------------------------------------------
 number of iterations   = 10
 primal objective value = -4.99999999e-01
 dual   objective value = -5.00000001e-01
 gap := trace(XZ)       = 1.99e-09
 relative gap           = 9.97e-10
 actual relative gap    = 9.73e-10
 rel. primal infeas (scaled problem)   = 6.56e-11
 rel. dual     "         "        "    = 1.00e-12
 rel. primal infeas (unscaled problem) = 0.00e+00
```

```
 rel. dual      "           "           "       = 0.00e+00
 norm(X), norm(y), norm(Z) = 9.4e+00, 5.6e-01, 2.1e+00
 norm(A), norm(b), norm(C) = 4.1e+00, 1.0e+01, 2.6e+00
 Total CPU time (secs)  = 0.22
 CPU time per iteration = 0.02
 termination code       =  0
 DIMACS: 6.6e-11  0.0e+00  1.3e-12  0.0e+00  9.7e-10  1.0e-09
-------------------------------------------------------------------

-------------------------------------------------------------
Status: Solved
Optimal value (cvx_optval): +0.5


x1 =

    0.5000


x2 =

    0.1667
```

```
****************************************************************************
------------------------------------------------problem
2-------------------------------------------

Calling SDPT3 4.0: 11 variables, 4 equality constraints
   For improved efficiency, SDPT3 is solving the dual problem.
-------------------------------------------------------------

 num. of constraints =  4
 dim. of socp   var  =  5,   num. of socp blk  =  1
 dim. of linear var  =  6
*********************************************************************
   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|9.5e-01|4.3e+00|2.3e+03| 2.204541e+02  0.000000e+00| 0:0:00| chol  1
1
 1|1.000|1.000|4.5e-07|5.0e-02|2.0e+02| 2.080252e+02  2.878193e+01| 0:0:00| chol  1
1
 2|0.943|0.925|6.8e-08|8.4e-03|1.2e+01| 4.760357e+01  3.641164e+01| 0:0:00| chol  1
1
 3|0.791|1.000|4.1e-07|5.0e-04|5.7e+00| 4.293607e+01  3.726829e+01| 0:0:00| chol  1
1
 4|1.000|0.888|5.7e-08|1.0e-04|1.4e+00| 4.015948e+01  3.881176e+01| 0:0:00| chol  1
1
 5|0.883|1.000|9.4e-09|5.0e-06|3.0e-01| 3.931792e+01  3.901936e+01| 0:0:00| chol  1
1
 6|1.000|0.983|2.6e-09|5.8e-07|1.6e-02| 3.913463e+01  3.911827e+01| 0:0:00| chol  1
1
 7|0.977|0.972|3.3e-10|6.5e-08|4.2e-04| 3.912522e+01  3.912480e+01| 0:0:00| chol  1
1
 8|0.988|0.988|8.6e-12|8.7e-10|5.2e-06| 3.912500e+01  3.912500e+01| 0:0:00| chol  1
1
 9|0.996|0.994|4.6e-13|6.9e-12|7.3e-08| 3.912500e+01  3.912500e+01| 0:0:00|
  stop: max(relative gap, infeasibilities) < 1.49e-08
-------------------------------------------------------------------
 number of iterations   =  9
 primal objective value =  3.91250000e+01
 dual   objective value =  3.91250000e+01
 gap := trace(XZ)       = 7.33e-08
 relative gap           = 9.25e-10
 actual relative gap    = 9.21e-10
 rel. primal infeas (scaled problem)   = 4.58e-13
 rel. dual     "         "         "   = 6.86e-12
 rel. primal infeas (unscaled problem) = 0.00e+00
```

```
 rel. dual      "         "        "       = 0.00e+00
 norm(X), norm(y), norm(Z) = 3.8e+01, 3.1e+00, 4.2e+00
 norm(A), norm(b), norm(C) = 4.3e+00, 3.4e+01, 5.3e+00
 Total CPU time (secs)  = 0.34
 CPU time per iteration = 0.04
 termination code       =  0
 DIMACS: 6.7e-13  0.0e+00  1.2e-11  0.0e+00  9.2e-10  9.3e-10
-------------------------------------------------------------------

----------------------------------------------------------
Status: Solved
Optimal value (cvx_optval): -21.625


x =

    1.0000
    0.5000
   -1.0000
```

```
********************************************************************************
-------------------------------------------------problem
3------------------------------------------
--------------------------------------------------------------------------------
----------problem 3_a-------------------------------------------

Calling SDPT3 4.0: 48 variables, 20 equality constraints
    For improved efficiency, SDPT3 is solving the dual problem.
------------------------------------------------------------------

 num. of constraints = 20
 dim. of socp   var  = 32,    num. of socp blk  = 16
 dim. of linear var  = 16
*********************************************************************
   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|2.0e+01|1.1e+01|1.8e+03| 0.000000e+00  0.000000e+00| 0:0:00| chol  1
1
 1|0.983|1.000|3.4e-01|1.0e-01|4.7e+01|-1.869504e-01 -1.711406e+01| 0:0:00| chol  1
1
 2|1.000|0.982|1.4e-07|1.2e-02|6.1e+00|-3.058179e-01 -6.351115e+00| 0:0:00| chol  1
1
 3|1.000|0.974|6.2e-07|1.3e-03|1.2e+00|-7.331590e-01 -1.950414e+00| 0:0:00| chol  1
1
 4|0.992|0.943|1.8e-08|1.7e-04|2.6e-01|-1.047306e+00 -1.311399e+00| 0:0:00| chol  1
1
 5|0.736|1.000|4.9e-09|1.0e-05|9.7e-02|-1.166013e+00 -1.263050e+00| 0:0:00| chol  1
1
 6|1.000|1.000|4.2e-10|1.0e-06|1.1e-02|-1.225668e+00 -1.237117e+00| 0:0:00| chol  1
1
 7|0.982|0.982|2.9e-10|1.2e-07|2.1e-04|-1.234441e+00 -1.234650e+00| 0:0:00| chol  1
1
 8|0.989|0.989|7.4e-11|1.4e-09|2.3e-06|-1.234603e+00 -1.234605e+00| 0:0:00| chol  1
1
 9|0.994|0.992|2.1e-10|2.5e-11|3.3e-08|-1.234605e+00 -1.234605e+00| 0:0:00|
  stop: max(relative gap, infeasibilities) < 1.49e-08
-------------------------------------------------------------------
 number of iterations   =  9
 primal objective value = -1.23460477e+00
 dual   objective value = -1.23460481e+00
 gap := trace(XZ)       = 3.26e-08
 relative gap           = 9.39e-09
 actual relative gap    = 9.60e-09
 rel. primal infeas (scaled problem)   = 2.07e-10
```

```
 rel. dual       "        "         "      = 2.51e-11
 rel. primal infeas (unscaled problem) = 0.00e+00
 rel. dual       "        "         "      = 0.00e+00
 norm(X), norm(y), norm(Z) = 9.7e-01, 2.1e+00, 5.6e+00
 norm(A), norm(b), norm(C) = 1.2e+01, 2.0e+00, 4.6e+00
 Total CPU time (secs)  = 0.35
 CPU time per iteration = 0.04
 termination code       =  0
 DIMACS: 2.1e-10  0.0e+00  4.6e-11  0.0e+00  9.6e-09  9.4e-09
-------------------------------------------------------------------

------------------------------------------------------------
Status: Solved
Optimal value (cvx_optval): +1.2346
```

x =

```
    0.0298
    0.0407
   -0.1294
```

```
#############################################################################
######
-------------------------------------------------------------------------------
----------problem 3_b----------------------------------------

Calling SDPT3 4.0: 35 variables, 16 equality constraints
------------------------------------------------------------

 num. of constraints = 16
 dim. of socp   var  = 32,    num. of socp blk  = 16
 dim. of free   var  =  3 *** 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|7.8e-01|8.6e+00|7.4e+02| 2.865344e+01  0.000000e+00| 0:0:00| chol  1
1
 1|1.000|0.854|1.7e-06|1.3e+00|7.5e+01| 4.089955e+01  1.220633e+01| 0:0:00| chol  1
1
 2|1.000|0.979|3.8e-07|3.6e-02|5.4e+00| 1.413073e+01  9.228779e+00| 0:0:00| chol  1
1
 3|0.877|0.864|8.5e-07|5.6e-03|8.2e-01| 1.123183e+01  1.046856e+01| 0:0:00| chol  1
1
```

```
 4|0.768|0.502|3.4e-07|2.8e-03|2.8e-01| 1.082481e+01  1.056846e+01| 0:0:00| chol  1
1
 5|1.000|0.433|2.5e-07|1.6e-03|1.2e-01| 1.073206e+01  1.062561e+01| 0:0:00| chol  1
1
 6|1.000|0.711|1.7e-08|4.7e-04|3.1e-02| 1.071277e+01  1.068589e+01| 0:0:00| chol  1
1
 7|1.000|0.627|3.6e-09|1.7e-04|1.2e-02| 1.071079e+01  1.070045e+01| 0:0:00| chol  1
1
 8|0.912|0.313|7.2e-10|1.2e-04|7.6e-03| 1.070969e+01  1.070314e+01| 0:0:00| chol  1
1
 9|0.984|0.977|2.8e-10|2.8e-06|1.8e-04| 1.070926e+01  1.070911e+01| 0:0:00| chol  1
1
10|0.989|0.989|4.4e-11|1.1e-06|2.9e-06| 1.070925e+01  1.070925e+01| 0:0:00| chol  1
1
11|0.583|0.945|1.9e-11|1.9e-08|1.9e-07| 1.070925e+01  1.070925e+01| 0:0:00| chol  1
1
12|0.558|0.943|8.4e-12|1.2e-09|4.6e-08| 1.070925e+01  1.070925e+01| 0:0:00|
  stop: max(relative gap, infeasibilities) < 1.49e-08
-------------------------------------------------------------------
 number of iterations   = 12
 primal objective value =  1.07092487e+01
 dual   objective value =  1.07092487e+01
 gap := trace(XZ)       = 4.59e-08
 relative gap           = 2.05e-09
 actual relative gap    = 1.96e-09
 rel. primal infeas (scaled problem)  = 8.40e-12
 rel. dual      "         "       "   = 1.24e-09
 rel. primal infeas (unscaled problem) = 0.00e+00
 rel. dual      "         "       "    = 0.00e+00
 norm(X), norm(y), norm(Z) = 5.0e+00, 3.8e+00, 5.5e+00
 norm(A), norm(b), norm(C) = 1.4e+01, 4.6e+00, 5.0e+00
 Total CPU time (secs)  = 0.15
 CPU time per iteration = 0.01
 termination code       =  0
 DIMACS: 1.5e-11  0.0e+00  3.1e-09  0.0e+00  2.0e-09  2.0e-09
-------------------------------------------------------------------

-------------------------------------------------------------
Status: Solved
Optimal value (cvx_optval): +10.7092


x =

   0.1813
  -0.1017
   0.1056
```

4. الف) همان طور که از Newton انتظار داریم سرعتِ اثِ دارا

Steepest
Derent
، جلوتر می‌شود. (معادل با ۱) (۲ هر شکل زونه

شده است.

4. ب) در این روش مشابه Backtracking موجب کاهش تابع

می‌گردد. مثل که حرای بعضی از معادله

(مثلا $c = 0.9$) والا علم می‌شد که به یک الگوریتم یبانی

دلیل است که $\nabla^2 f$ همچنان Positive definite نیست

ولی در گزارش ما تا آنجایی که هر کارانسته است روند کاهشی

در F ایجاد کند گزارش شده است.

****
--problem 4 SteepestDecent Cubic
----
 initial point [0 1]
X

ans =

    0.0229
    0.0386

Alpha

ans =

   3.6915e-04

F*

ans =

    1.0998

SteepestDecent Cubic[-1 1].txt
****
---problem 4 SteepestDecent Cubic
----
initial point [-1 1]
X

ans =

    -0.9989
     0.9999

Alpha

ans =

    4.5925e-05

F*

ans =

     3.9961

****

---problem 4 SteepestDecent Cubic

----
initial point [2 1]
X

ans =

    1.3729
    1.1872

Alpha

ans =

    1.1921e-05

F*

ans =

    48.7946
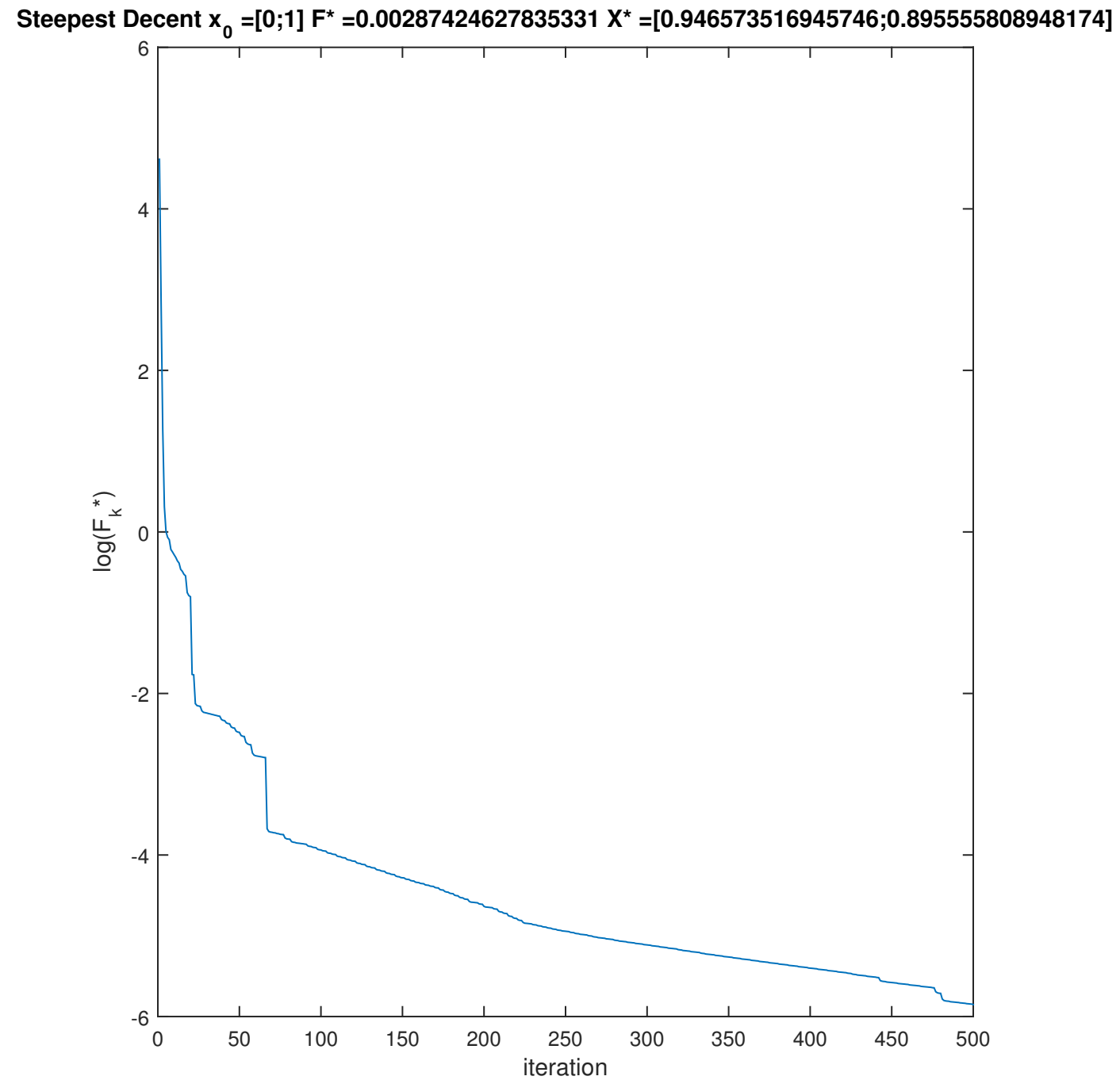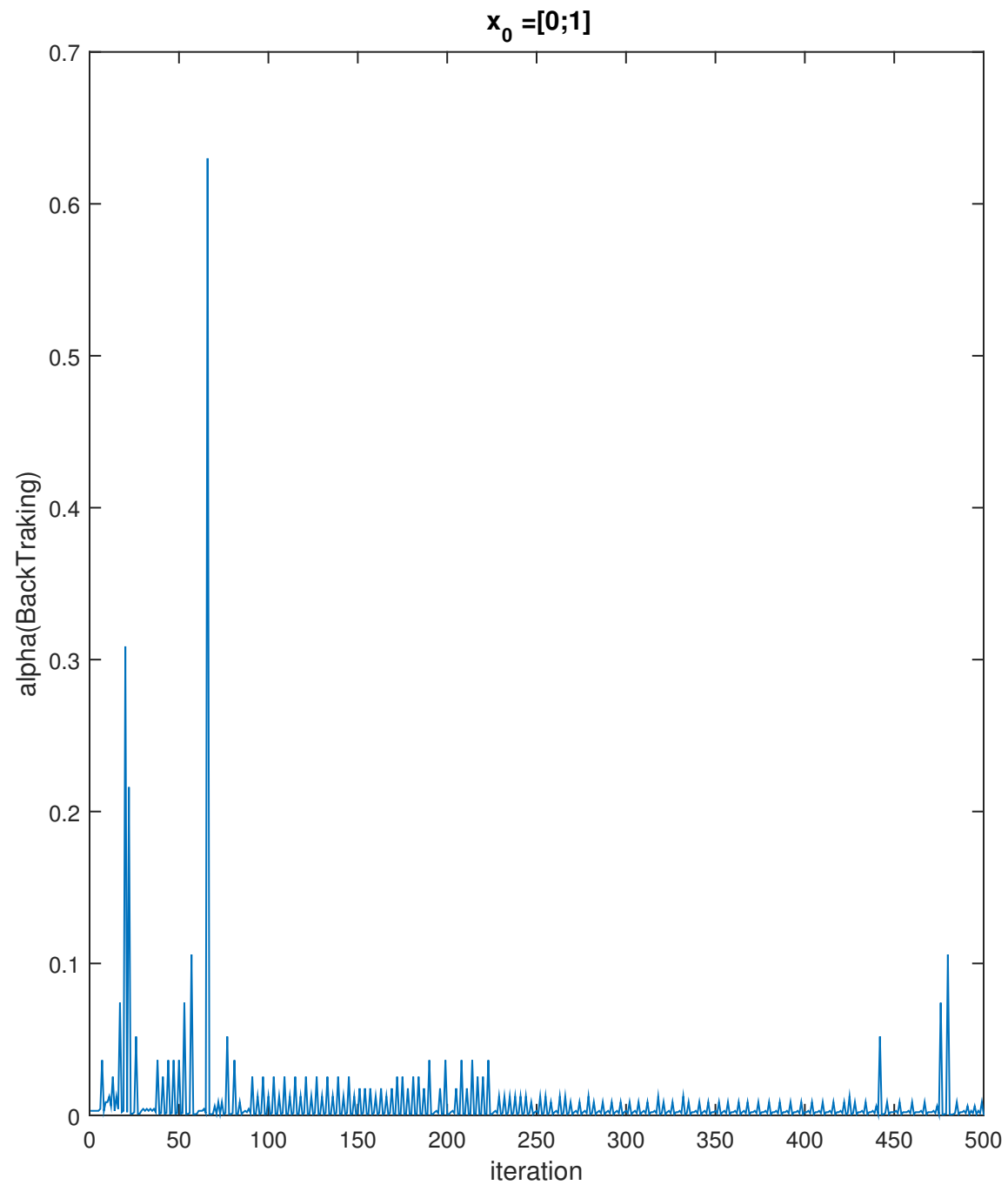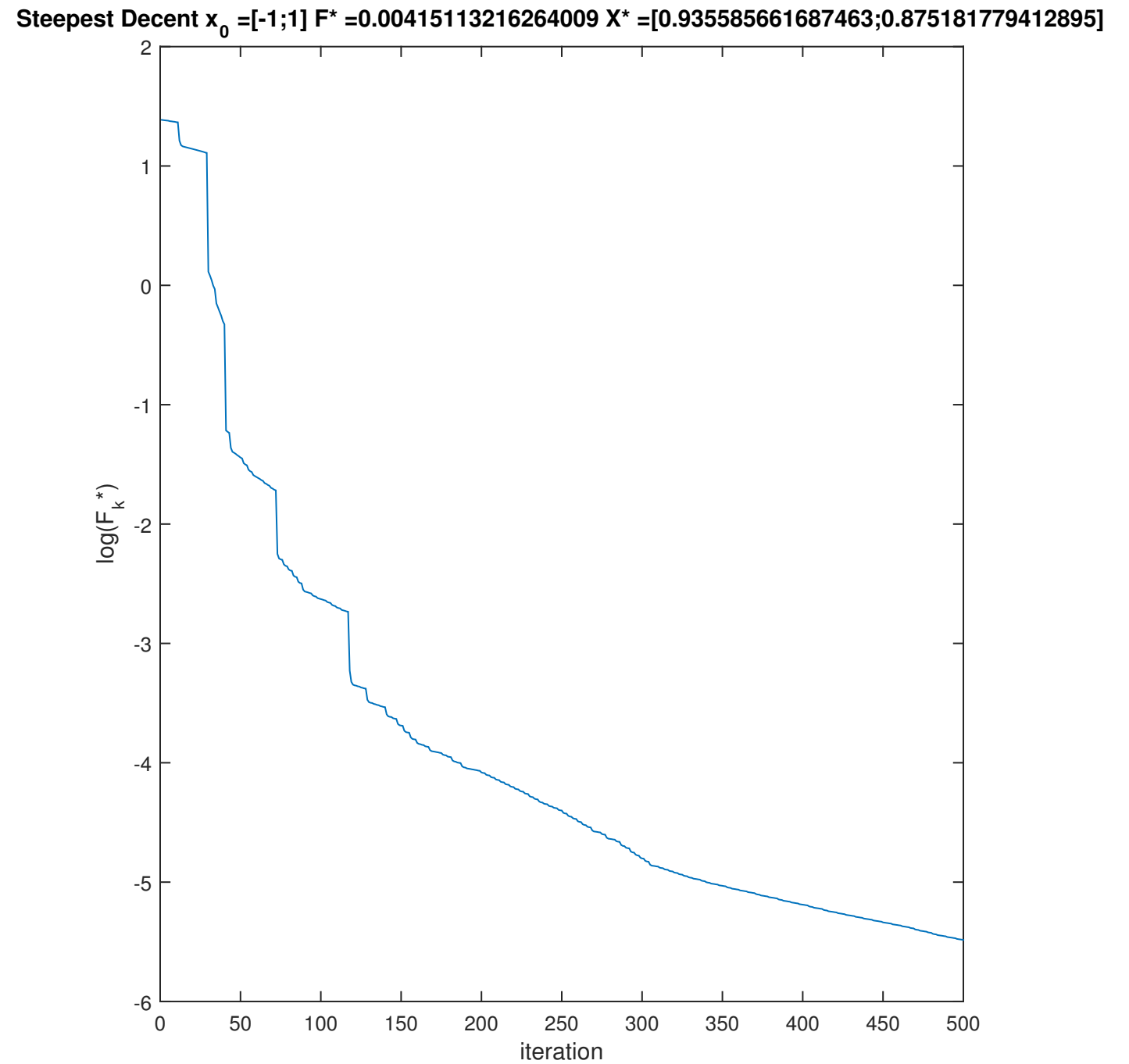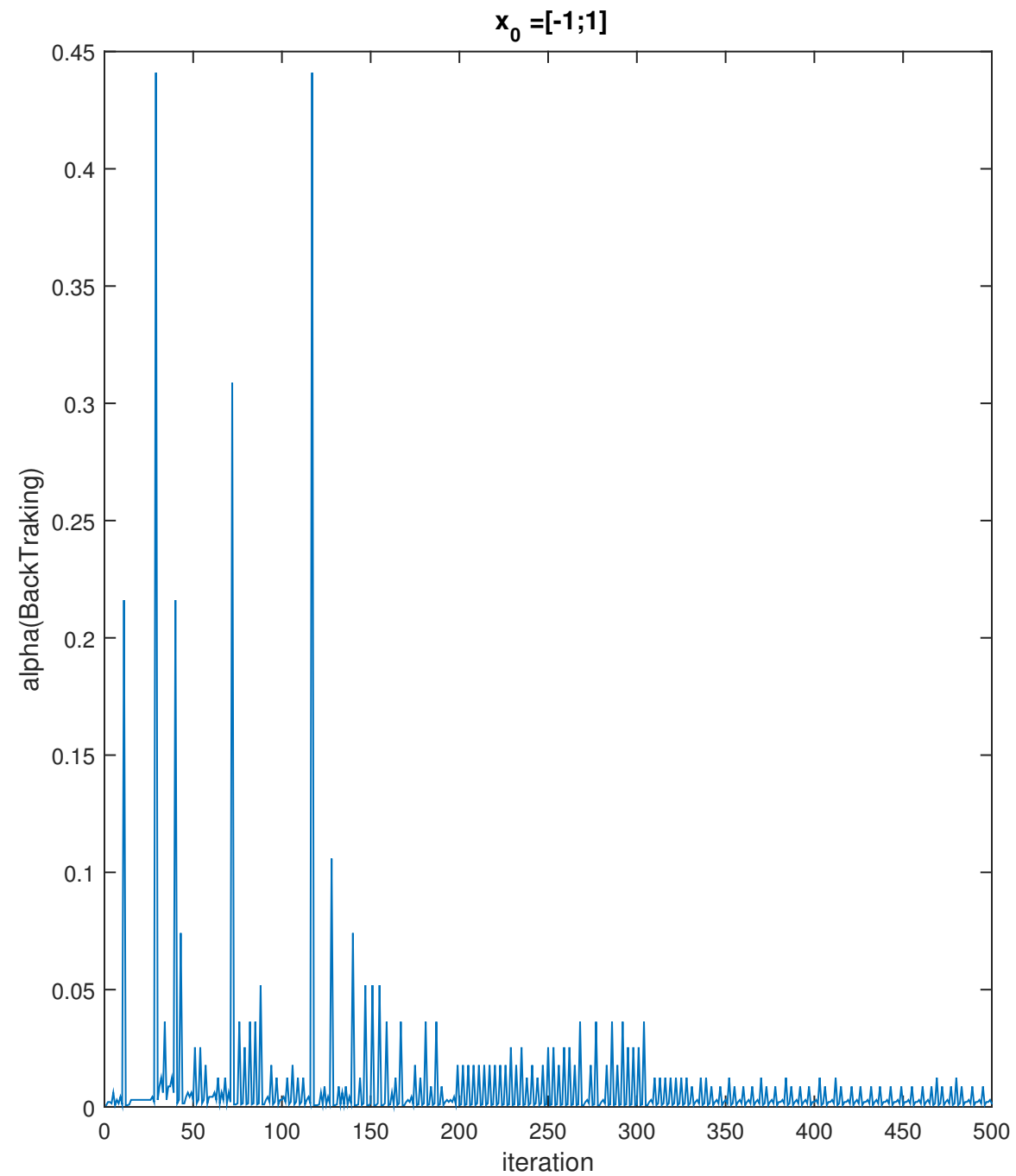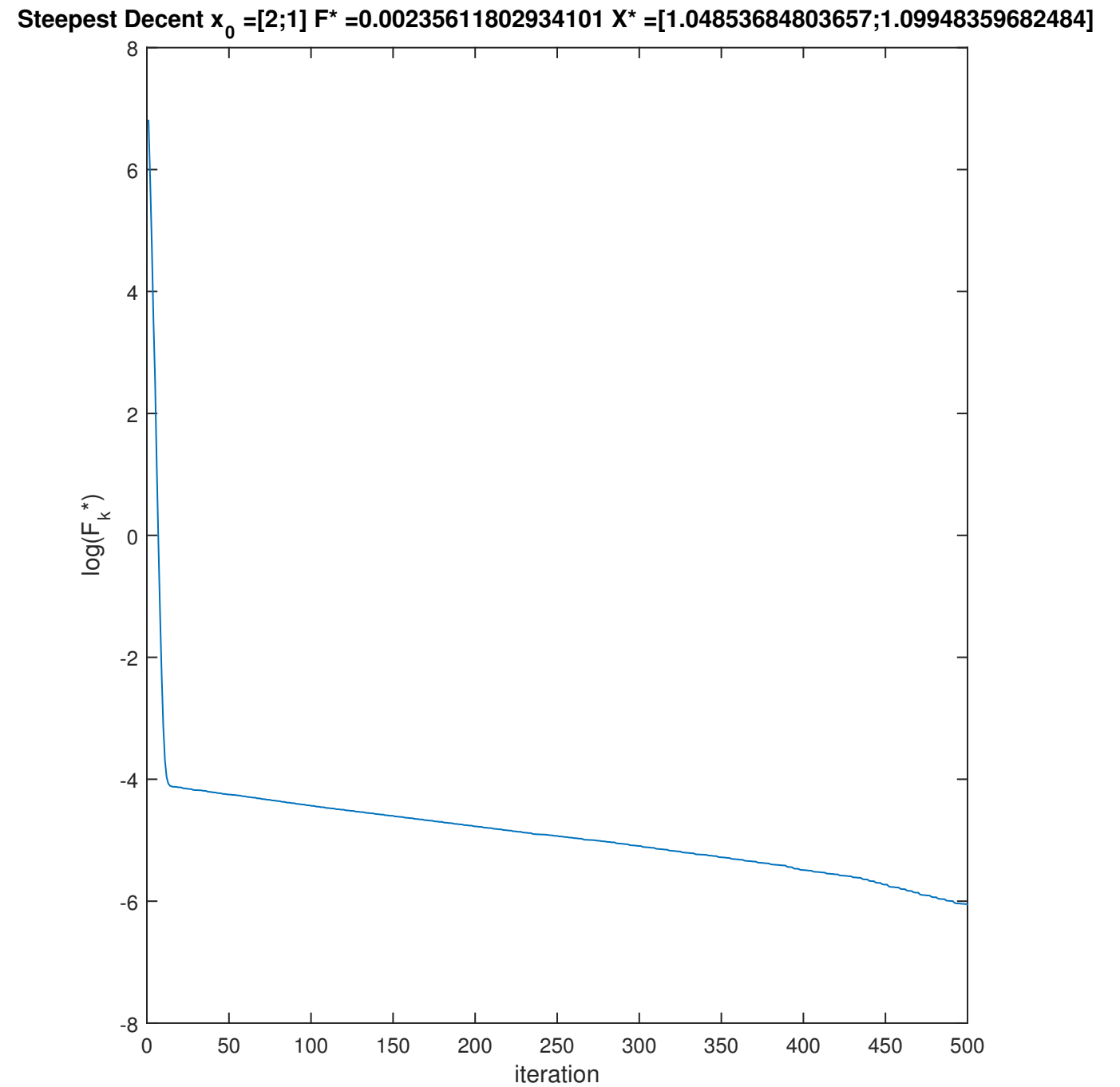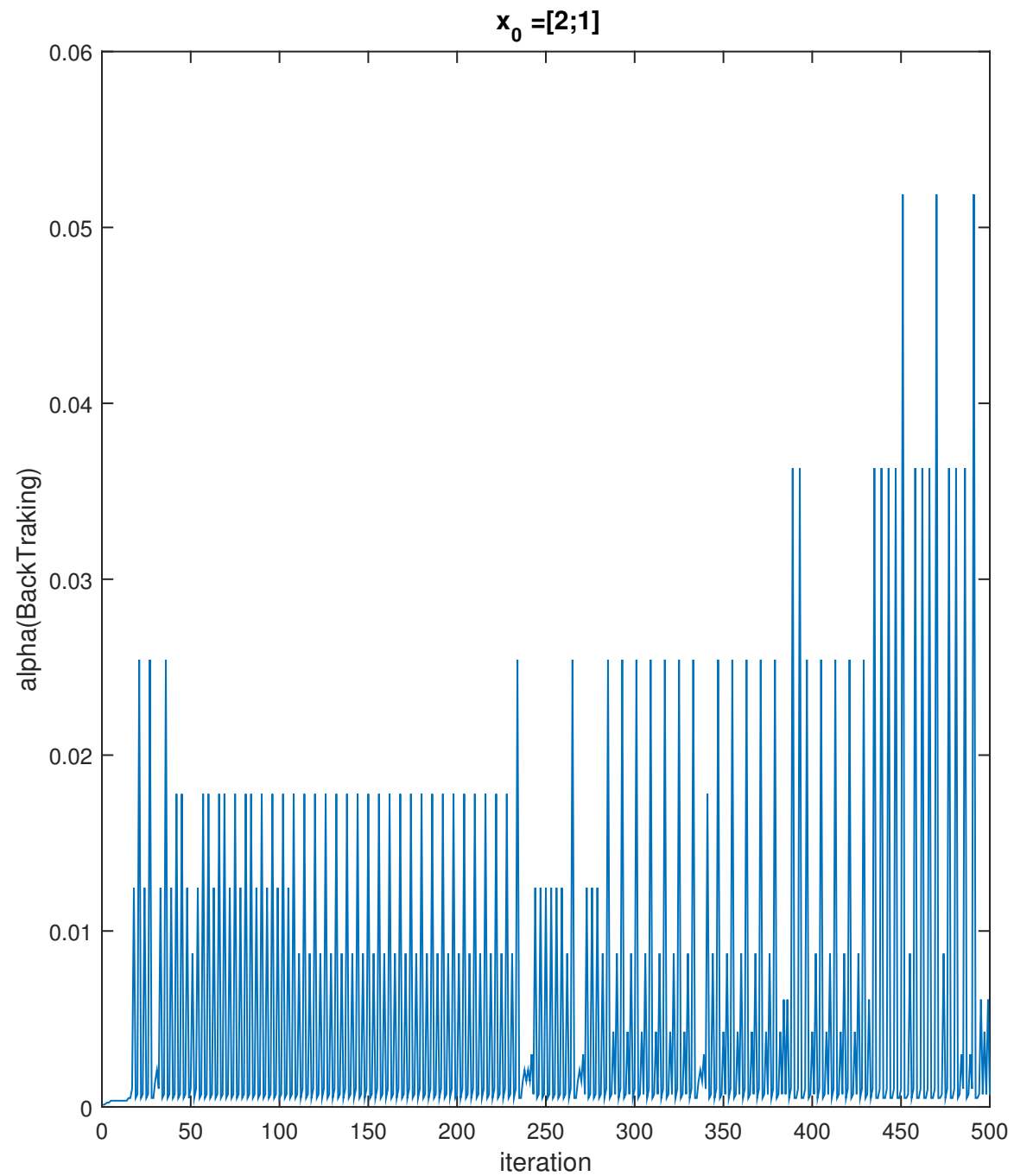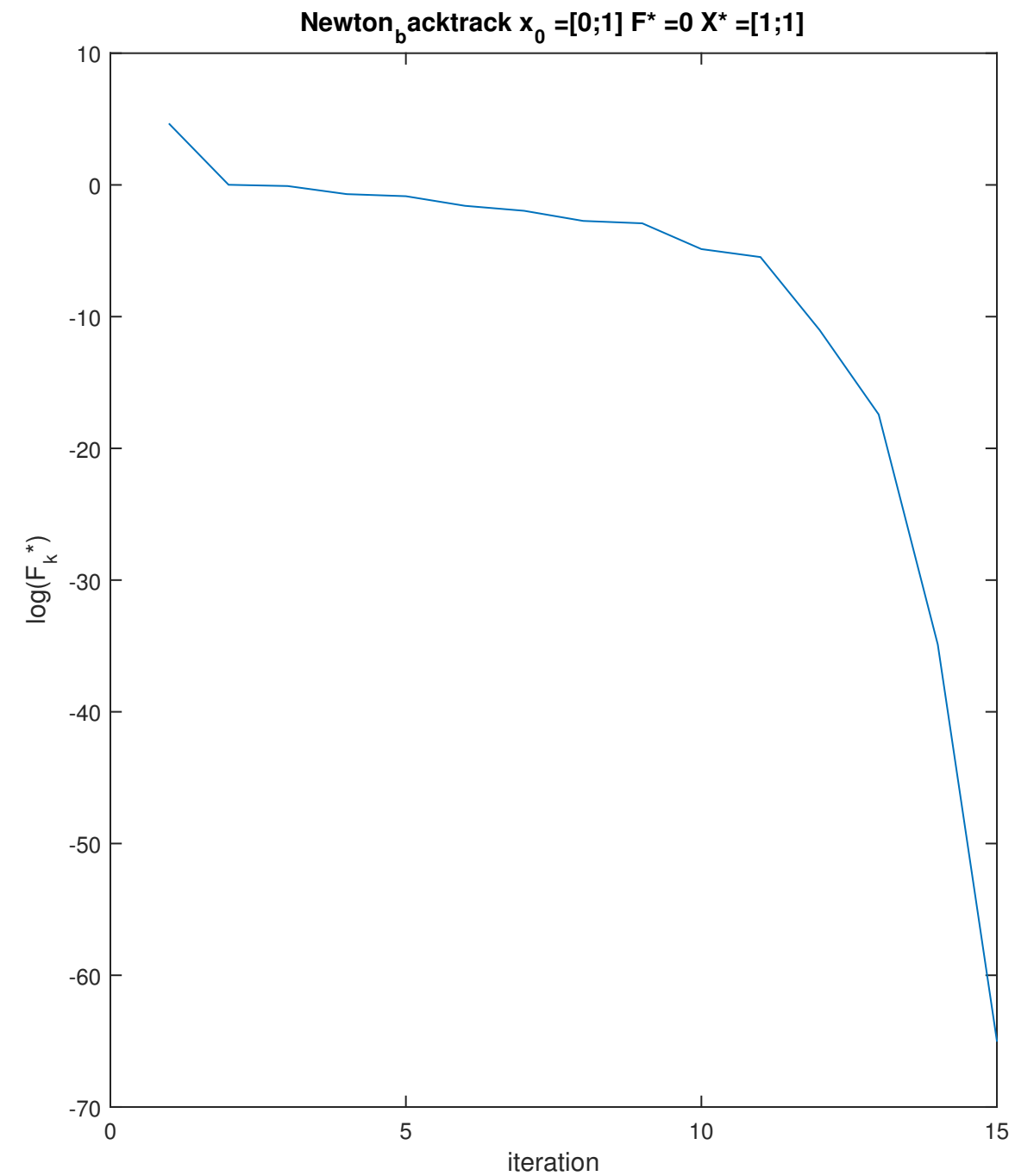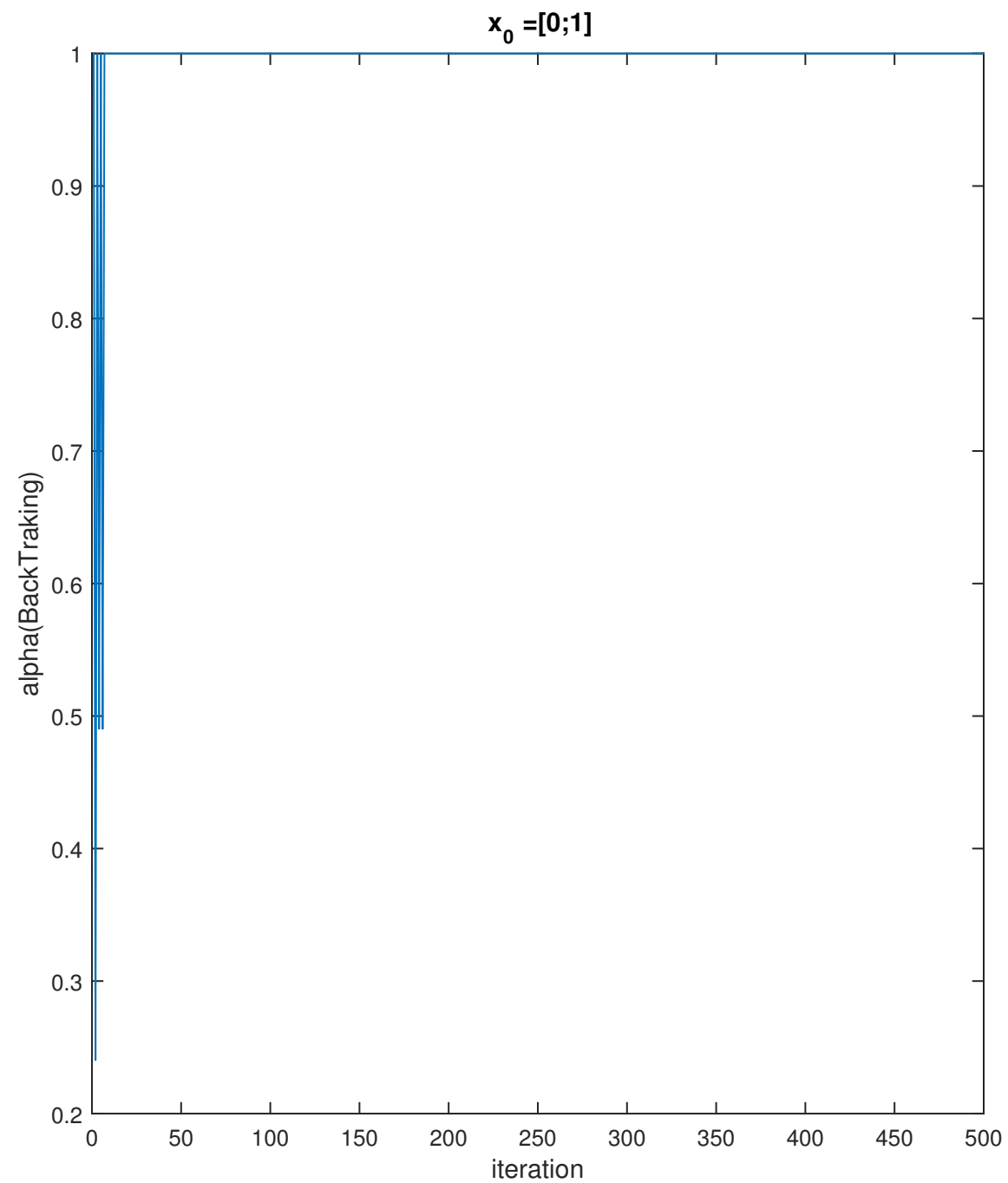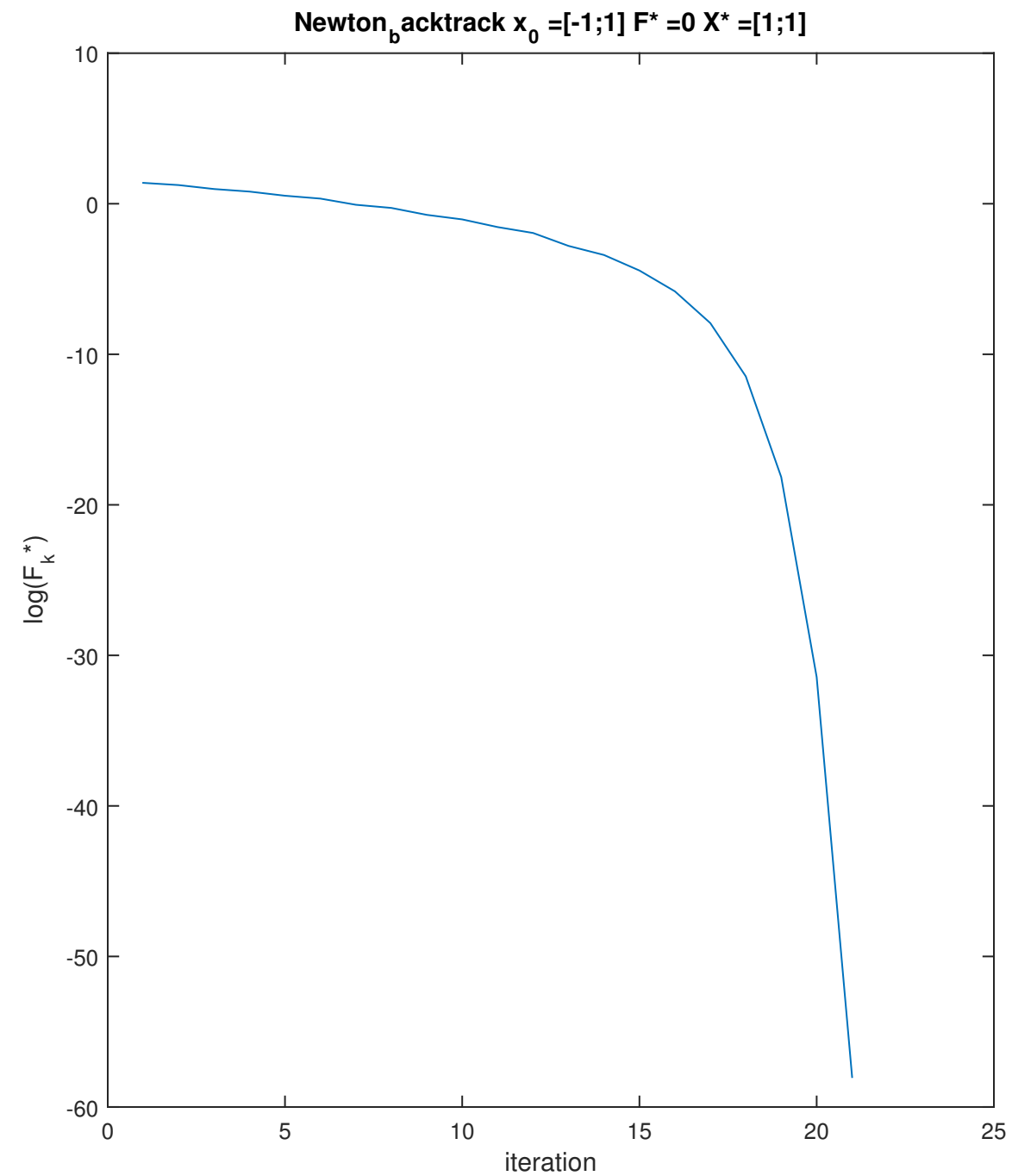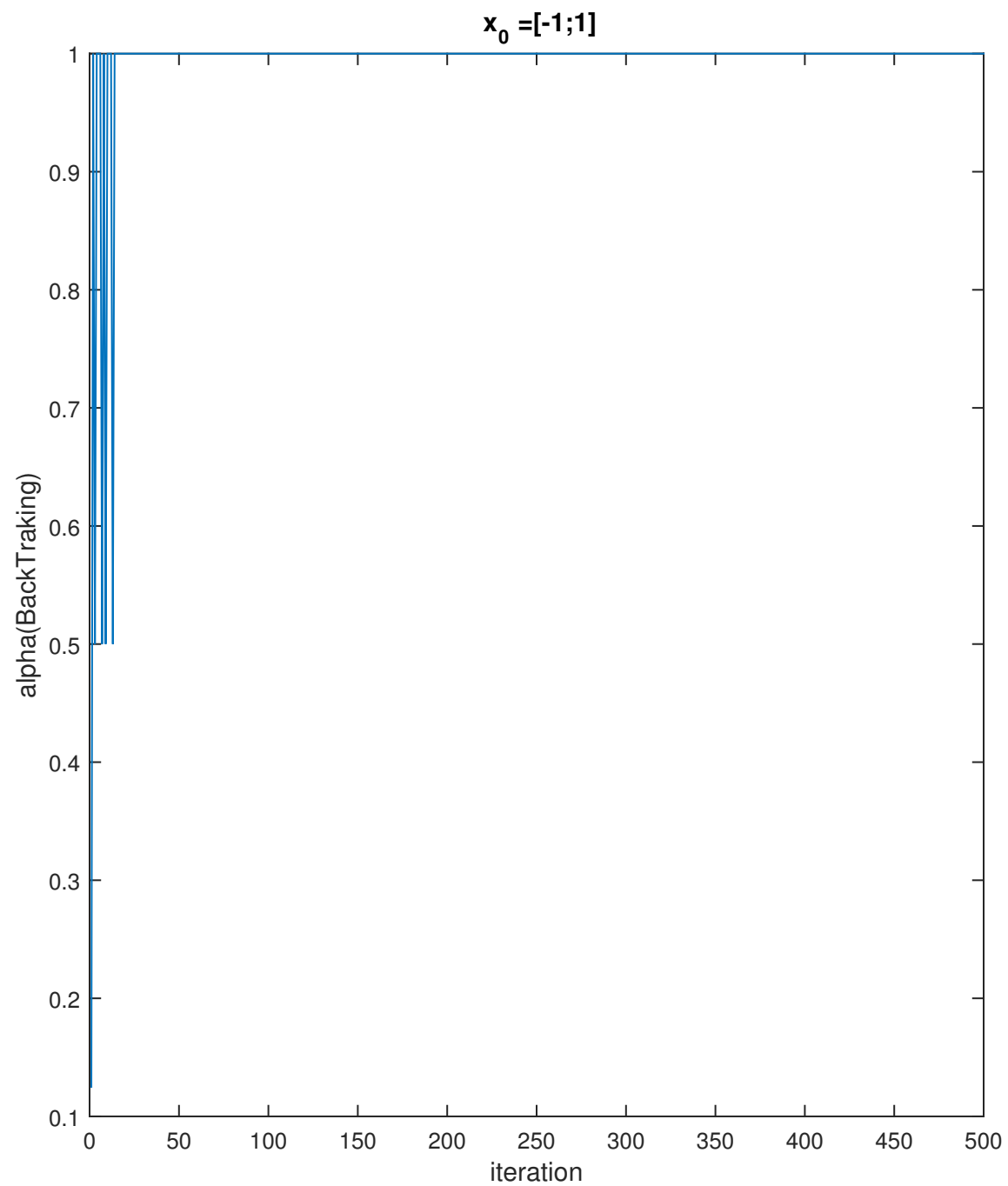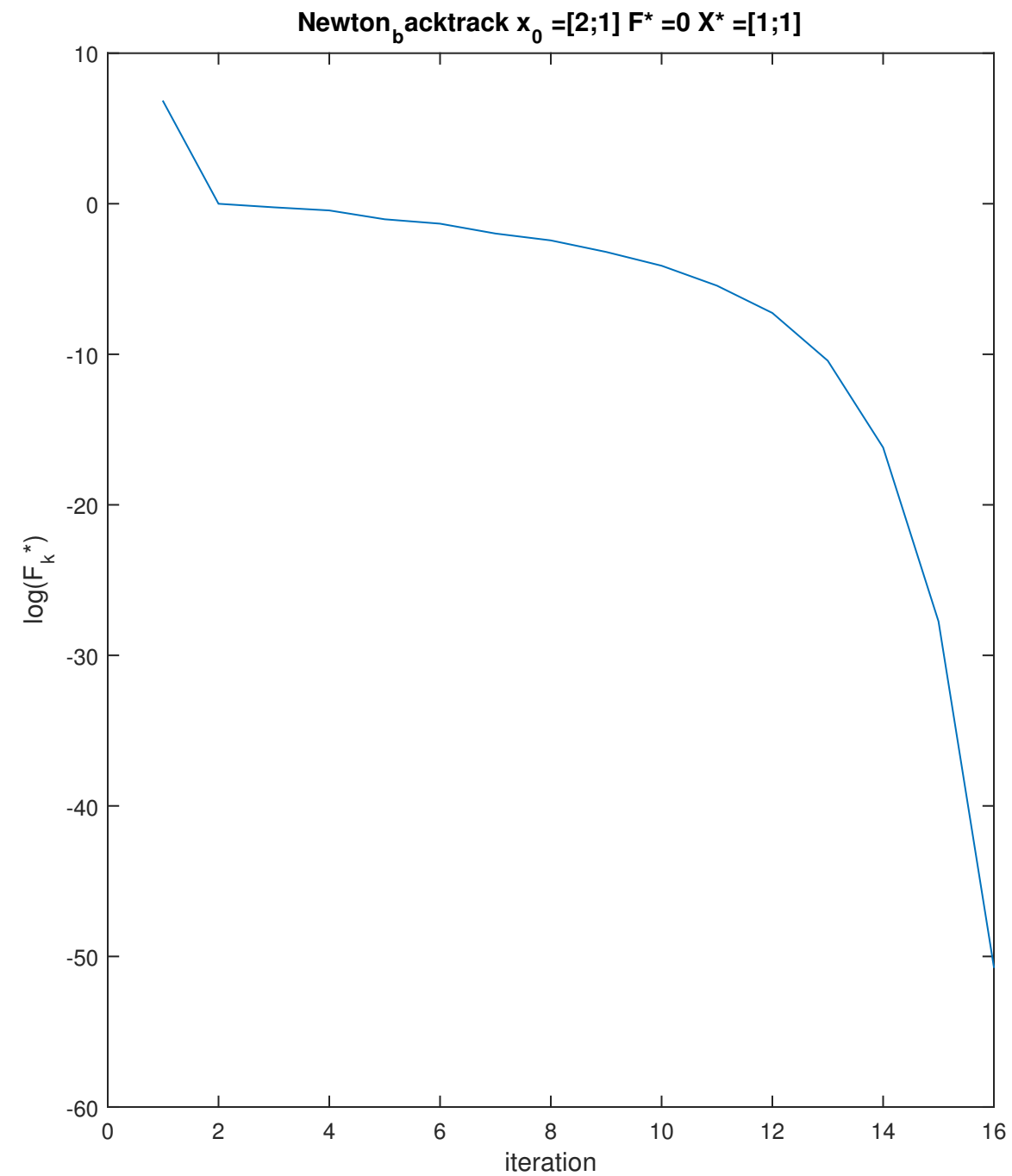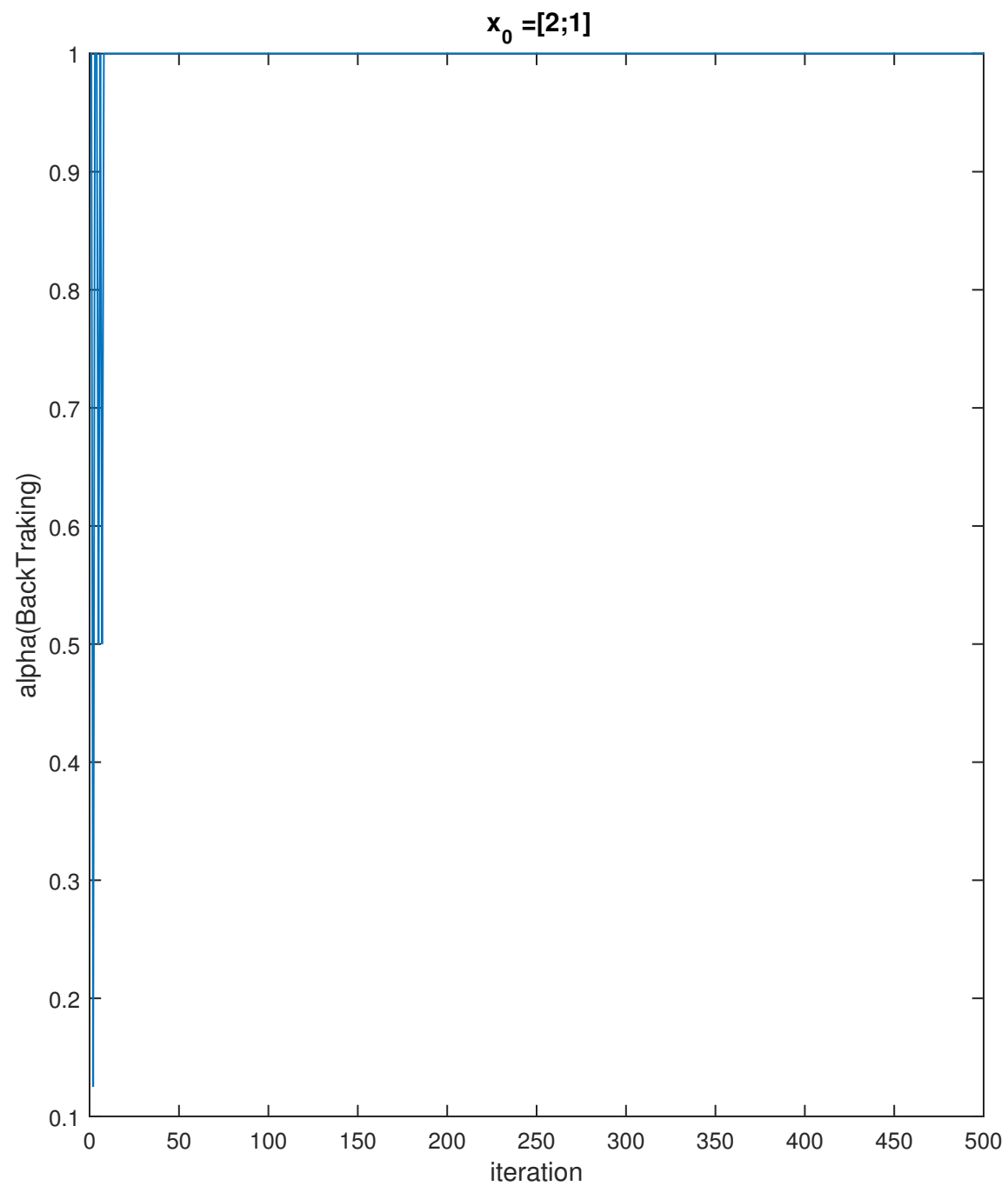
x₀ =[-1;1]

Steepest Decent x₀ =[-1;1] F* =0.00415113216264009 X* =[0.935585661687463;0.875181779412895]

x₀ =[2;1] — left plot: x-axis "iteration", y-axis "alpha(BackTraking)"

Steepest Decent x₀ =[2;1] F* =0.0023561802934101 X* =[1.04853684803657;1.09948359682484] — right plot: x-axis "iteration", y-axis "log(F*ₖ)"

Left panel title: $x_0 = [-1;1]$

Left panel y-axis: alpha(BackTraking)

Left panel x-axis: iteration

Right panel title: $Newton_{backtrack}$ $x_0 = [-1;1]$ F* =0 X* =[1;1]

Right panel y-axis: $\log(F_k^*)$

Right panel x-axis: iteration

۵ـ الف: برای تخمین جواب کامل است ۲، اما ...

مسئله‌ی اصلی را:

$$\Delta = \sum_k \left\| \left(\lambda \sigma_k^2 \right)(I-T) + TP^v \right\|^2 \quad \text{حل کنیم}$$

اگر نوشته شده اگر Δ معلوم در جمع ۲ بالا منفی شود در هر نقطه گرفته‌ایم (جاهایی با تقاطع مسیر با نمونه شعاع ۲ـ۰ و اگر ...) Δ است.

اگر $\|E\| \leq \|\lambda\|$ باشد یعنی Full step جواب نهایی است.

باید مدل دهش $\langle L \rangle$ به جواب می‌رسیم

$$P_c = \frac{-g^T g}{g^T \delta g} \quad \text{است که صرفاً عایدی در راه ...}$$

****
--problem 5_A
Trust---
initial point = [2,2]
Delta = 2

X_star =

    1.0658
    1.1175

Delta = 1

X_star =

    1.1664
    1.3285

Delta = 0.5

X_star =

    1.2748
    1.7252

```
--------------------------------------problem 5_B DogLeg and Cauchy --------------------------------------------
initial point = [2,2]
\delta = 0.2

min_val_Cauchy_model =

    1.3122


P_c =

    -0.1952
     0.0434

\delta = 1

min_val_Cauchy_model =

    -2.8150


P_c =

    -0.4137
     0.0919

\delta = 2

min_val_Cauchy_model =

    -2.8150


P_c =

    -0.4137
     0.0919

»
```

****
-------------------------------------problen 5_B DogLeg and Cauchy -------------------------------------
```
initial point = [2,2]
\delta = 0.2
out of trust

min_val_dog_model =

    3.1244


P_dog =

   -0.1655
    0.0368

\delta = 1
out of trust

min_val_dog_model =

    3.0462


P_dog =

   -0.2069
    0.0460

\delta = 2
out of trust

min_val_dog_model =

    3.0462


P_dog =

   -0.2069
    0.0460

»
```

```
                              6.txt
**************************************************************************
---------------------------------------------problem 6 A
-------------------------------------------
X

X_est_steepest =

    0.8095
    1.4286
    1.4762

**************************************************************************
---------------------------------------------problem 6 B
-------------------------------------------

X_est =

    0.8095
    1.4286
    1.4762


r =

    1.0000   -0.3333   -0.0800        0
   -1.0000   -0.0000   -0.1600   0.0000
   -1.0000   -0.3333    0.0800        0


ans =

    0.8095
    1.4286
    1.4762

**************************************************************************
---------------------------------------------problem 6 C
-------------------------------------------

X_real =

    0.8095
    1.4286
    1.4762
```