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https://github.com/MotiMarom/Opimization_Prog_2_Final.git

## Optimization programming assignment #2

### Quadratic objective function

Please pick a function for analysis from the following:

1-quadratic, 2-linear

You chose 1: quadratic

Barrier init: x = [0.1 0.2 0.7], f(x) = 2.9399999999999995, m/t = 4.0

Barrier iteration #0: x = [0.91666667 0.85714286 0.125 ], f(x) = 2.8405966553287985, m/t = 4.0

Barrier iteration #1: x = [ 0.16350138 0.16535927 -1.0323219 ], f(x) = 0.055121095712402715, m/t = 0.4

Barrier iteration #2: x = [ 0.03452498 0.03420299 -1.00470971], f(x) = 0.002384000147505982, m/t = 0.04

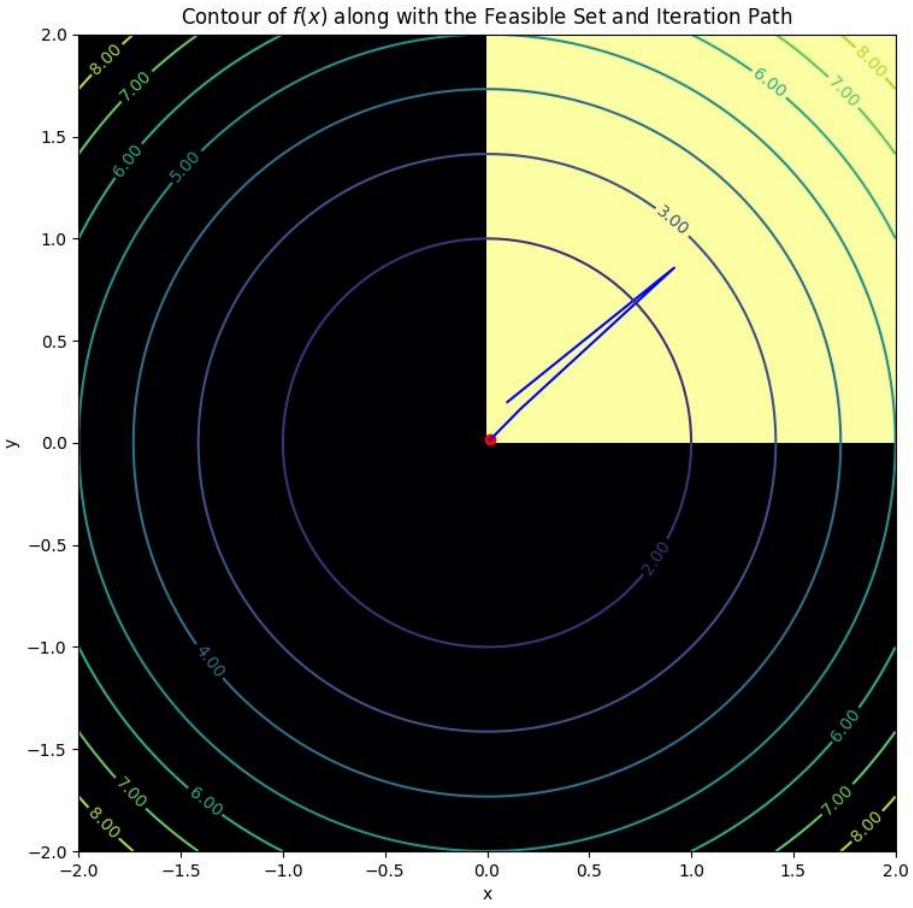
Barrier iteration #3: x = [ 0.01476839 0.01490078 -1.00049556], f(x) = 0.00044038399916300367, m/t = 0.004

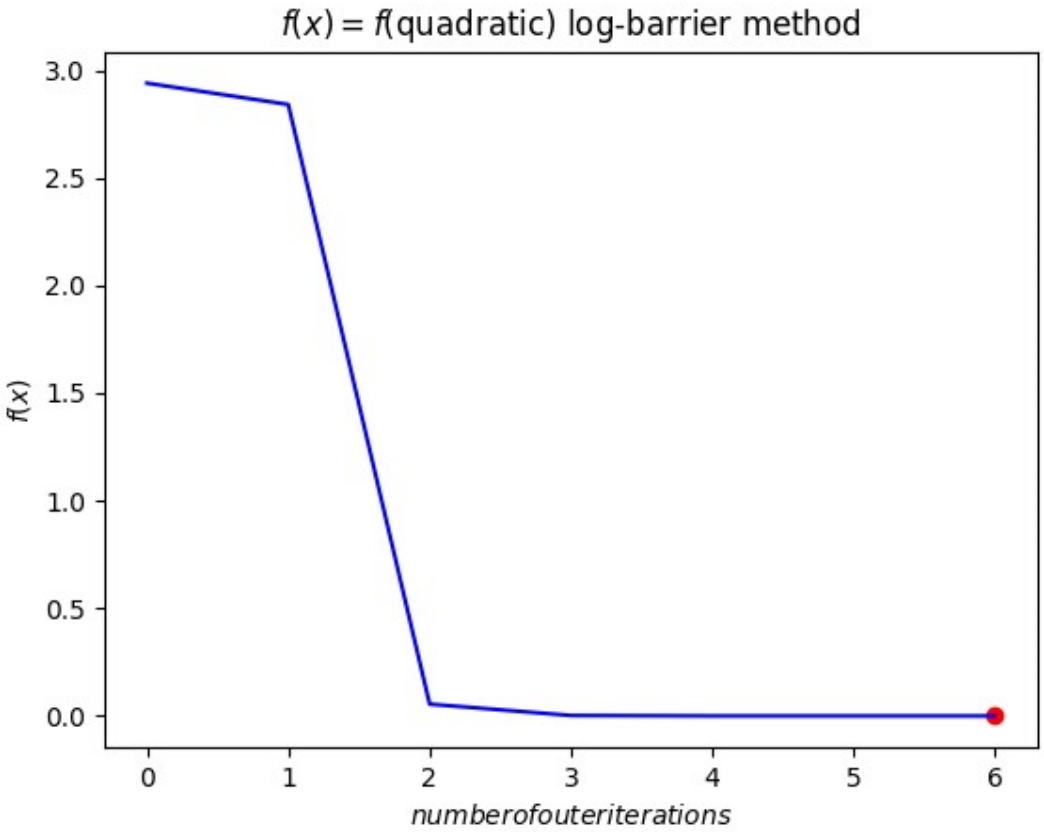
Barrier iteration #4: x = [ 0.01476839 0.01490078 -1.00049556], f(x) = 0.00044038399916300367, m/t = 0.0004

Barrier iteration #5: x = [ 0.01476839 0.01490078 -1.00049556], f(x) = 0.00044038399916300367, m/t = 4e-05

End of quadratic analysis

**Reached to the requested point! (x,y,z)~=(0,0,-1)**


Contour of $f(x)$ along with the Feasible Set and Iteration Path
8.00
7.00
6.00
5.00
3.00
2.00
4.00
x
y


f(x) = f(quadratic) log-barrier method
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f(x)
0
1
2
3
4
5
6
numberofouteriterations

**Linear objective function**

You chose 2: linear

Barrier init: x = [0.5  0.75], f(x) = -1.25, m/t = 4.0

Barrier iteration #0: x = [1.46285357 0.69672008], f(x) = -2.1595736488296318, m/t = 4.0

Barrier iteration #1: x = [1.9051114  0.91403322], f(x) = -2.819144619723565, m/t = 0.4

Barrier iteration #2: x = [1.9899595  0.99005958], f(x) = -2.980019076002479, m/t = 0.04

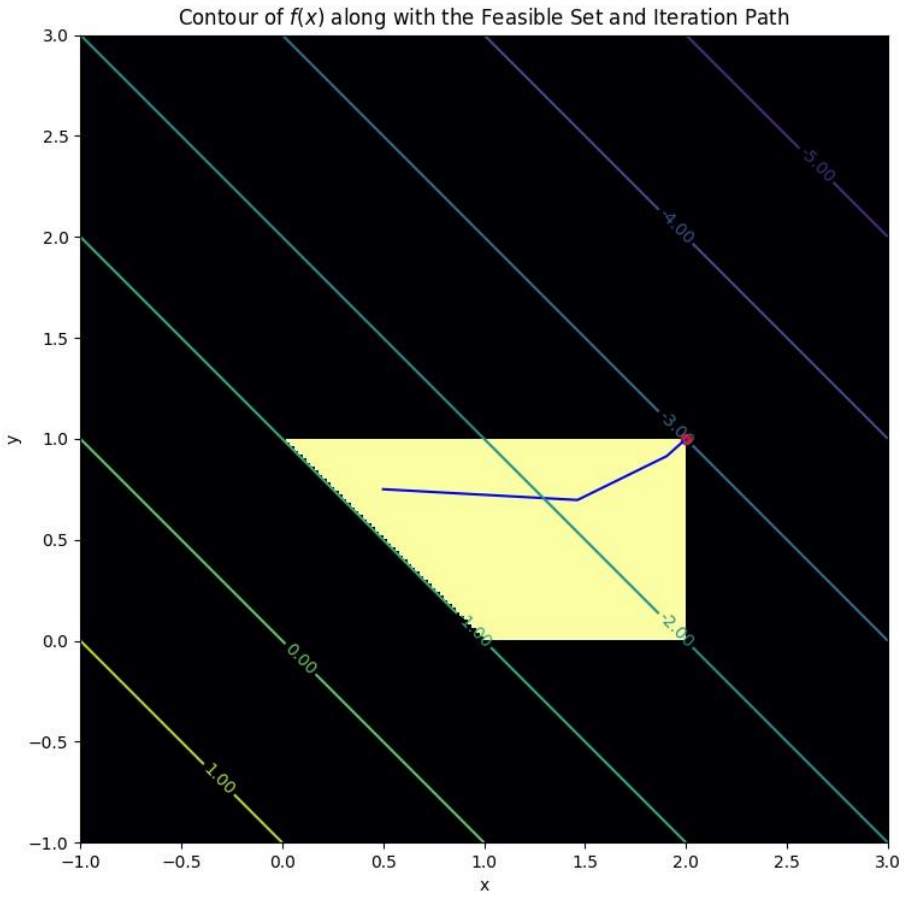
Barrier iteration #3: x = [1.99891566 0.99891675], f(x) = -2.9978324106590093, m/t = 0.004

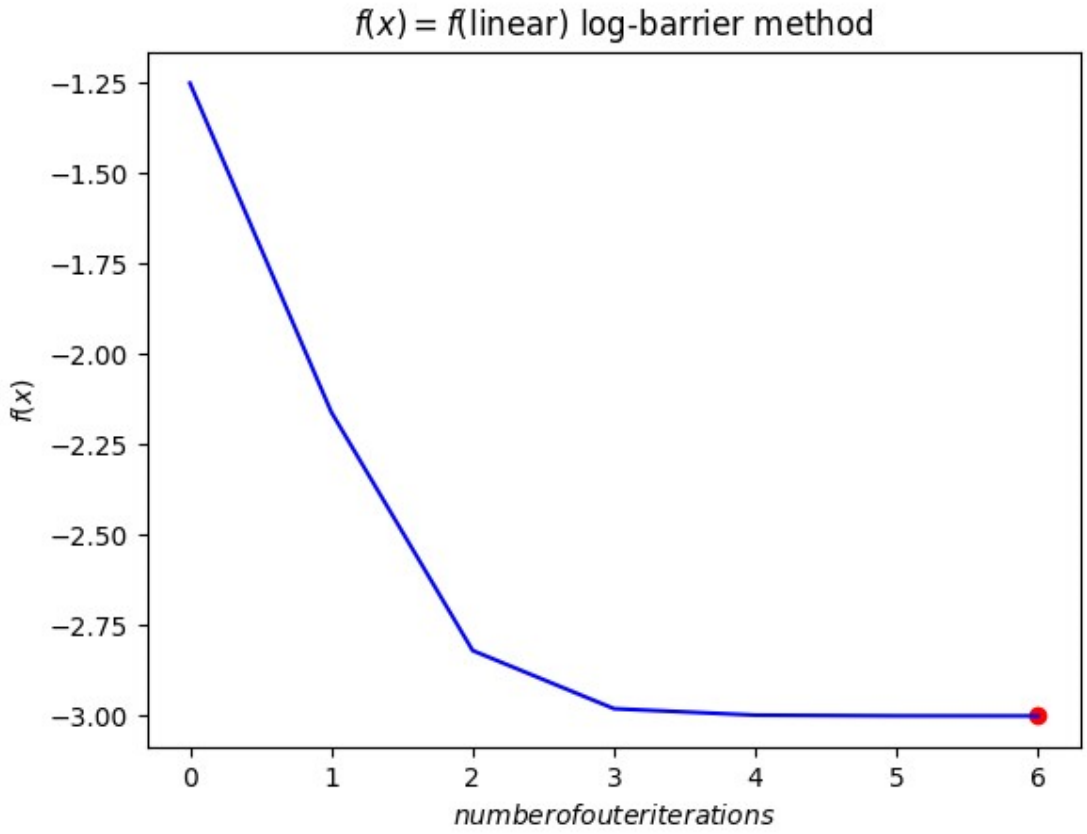
Barrier iteration #4: x = [1.99984547 0.99984548], f(x) = -2.9996909529079043, m/t = 0.0004

Barrier iteration #5: x = [1.99996881 0.9999688 ], f(x) = -2.9999376108314997, m/t = 4e-05

End of linear analysis

**Reached to the requested point, the upper right vertex of the polygon, (x,y)~=(2,1)**




f(x) = f(linear) log-barrier method
−1.25
−1.50
−1.75
−2.00
−2.25
−2.50
−2.75
−3.00
f(x)
0
1
2
3
4
5
6
numberofouteriterations