Numeric Optimization “Wet” exercise 2:

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Link to github - [eldaduzman/numeric-optimization-coding-ex-2]

Contents

Test 1 – Quadratic programming

Final locations:

$$X = \begin{matrix} 0.5 \\ 0.5 \\ 0 \end{matrix}$$

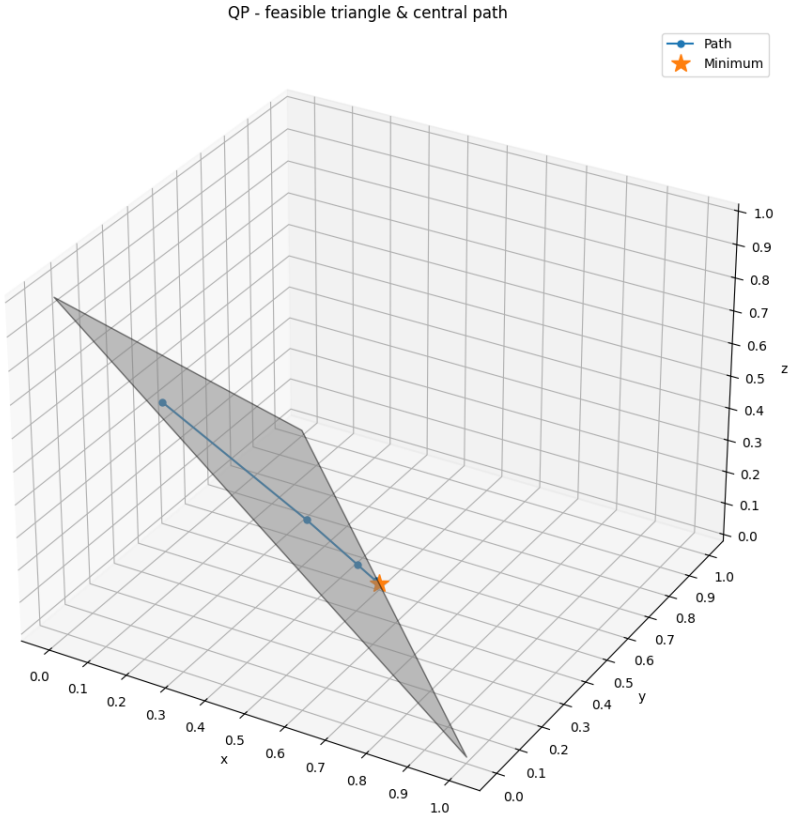
$$\mathrm{f(X)} = 1.5$$

Screenshots:

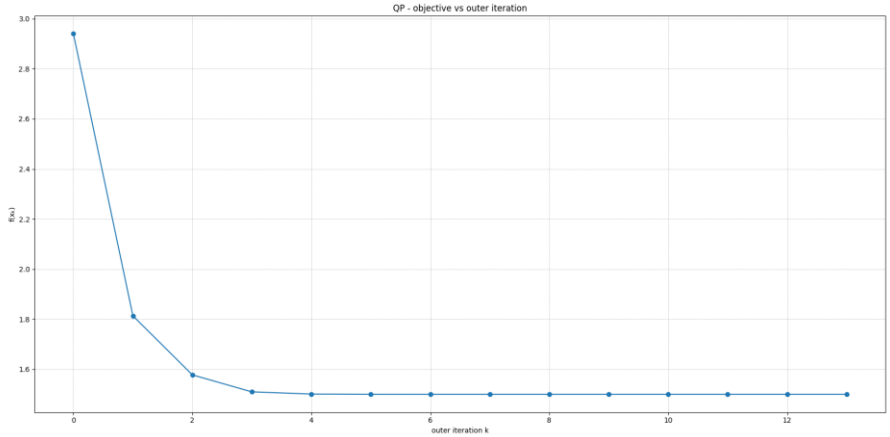
```
test_quadratic_circle (test_unconstrained_min.TestLineSearch.test_quadratic_circle) ... Gradient Descent iteration 1/100, x=[0. 0.], f(x)=0.0
Newton iteration 1/100, x=[0. 0.], f(x)=0.0
ok
```

Plots:

Path on the feasible space:



Iterations:



Test 2 – Linear Programing

Final locations:

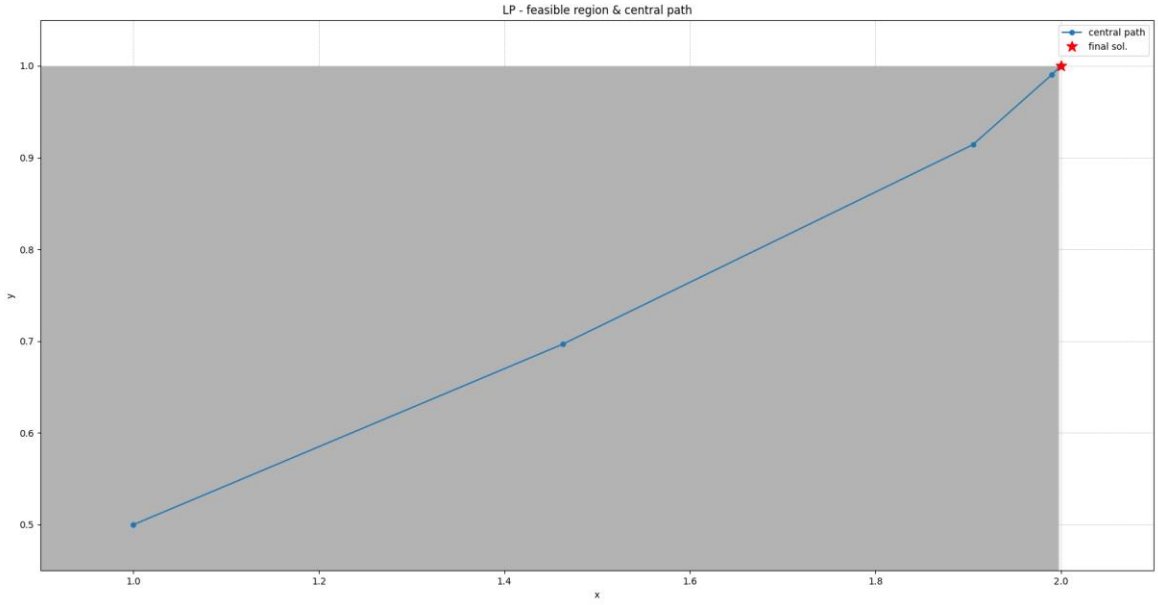
The original problem was $\max_{x,y} x + y$ which is equivalent to $\min_{x,y}$ -x-y

$$X = \begin{matrix} 2 \\ 1 \end{matrix}$$

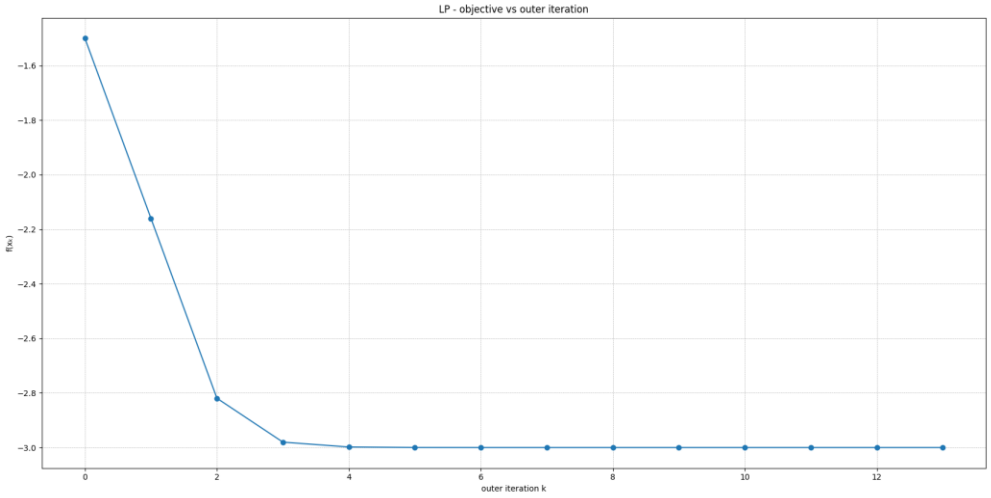
$$f(X) = 3$$

Plots:

Path on the feasible space:



Iterations:


LP - objective vs outer iteration
f(x_k)
−1.6
−1.8
−2.0
−2.2
−2.4
−2.6
−2.8
−3.0
0
2
4
6
8
10
12
outer iteration k