Constrained Minimization Task Report

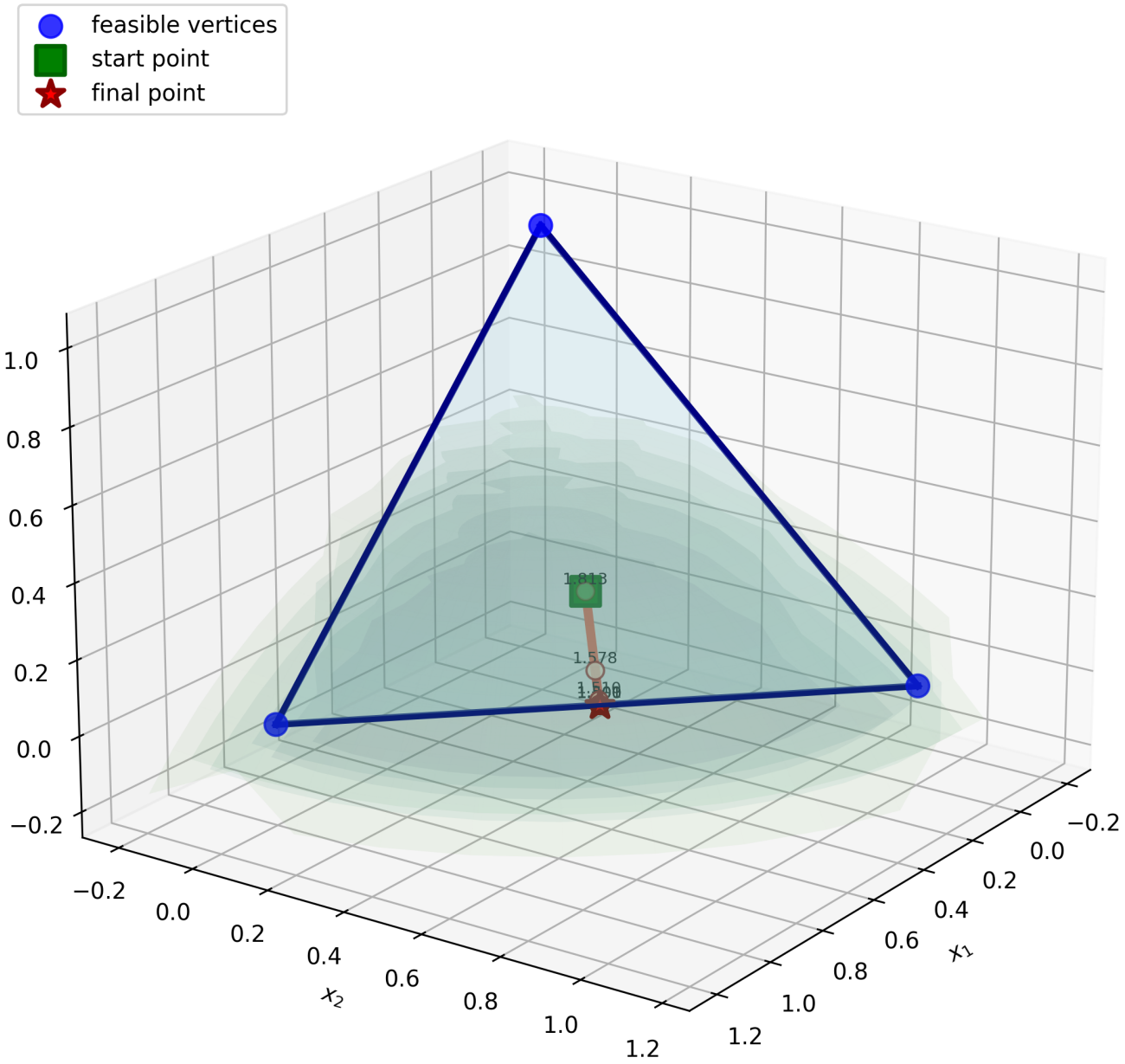
GitHub Repository: PyOPT-Task2

Quadratic Programming (QP) Solution

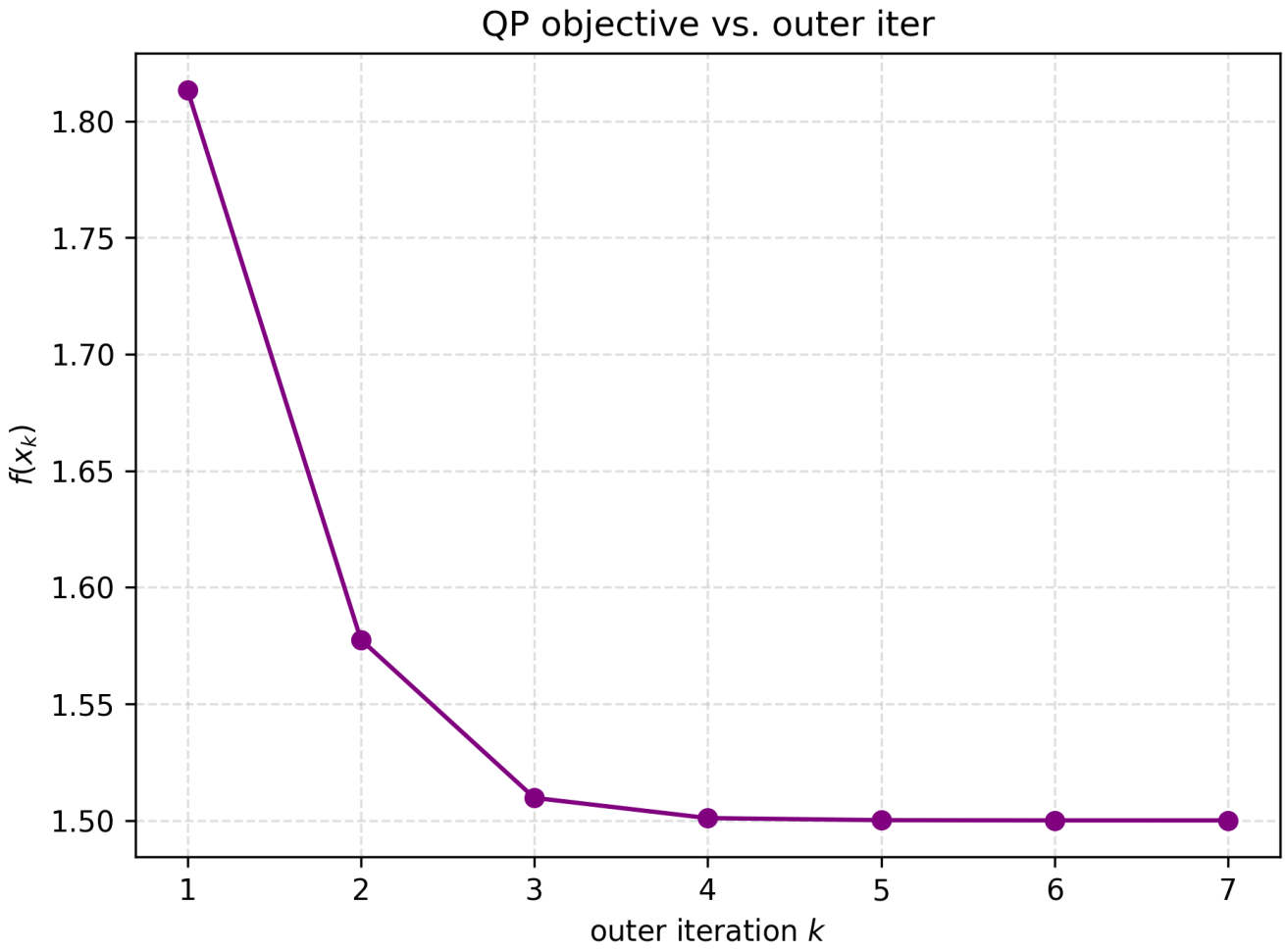
- **Optimal Solution:**
  $x* = [0.4999995, 0.4999995, 0.000000999993609]$
- **Objective Value:**
  1.500001
- **Inequality Constraints at x*:**
  - Constraint 1: $c_1(x*) = -0.4999995$
  - Constraint 2: $c_2(x*) = -0.4999995$
  - Constraint 3: $c_3(x*) = -0.000000999993609$
- **Equality Residuals:**
  $[-1.11022302e-16]$

Central Path Plot:

QP: $f(x) = x_1^2 + x_2^2 + (x_3 + 1)^2$
Feasible Region: $x_1 + x_2 + x_3 = 1, x_i \geq 0$



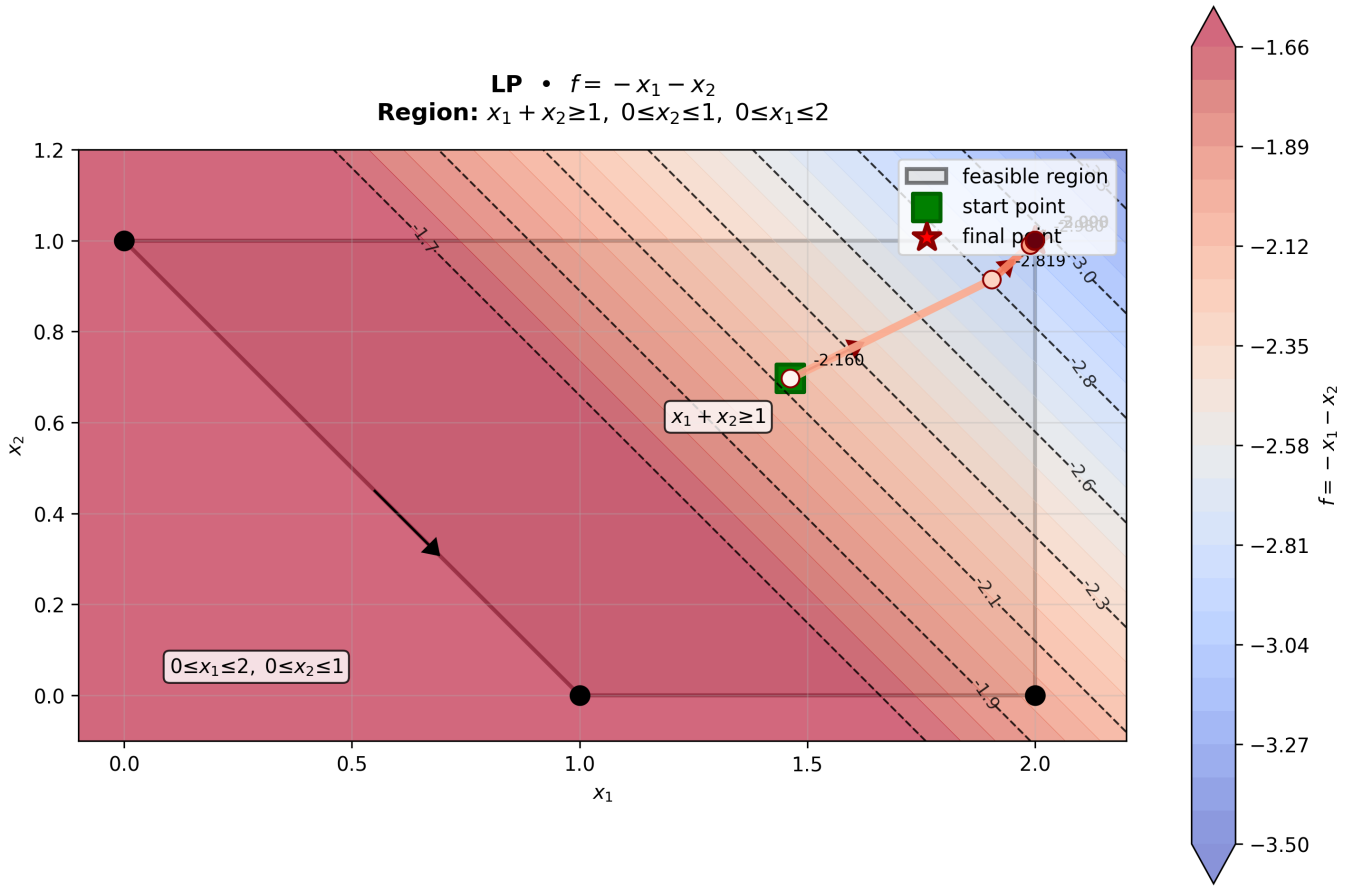
Objective Function Plot:



Linear Programming (LP) Solution

- **Optimal Solution:**
  `x* = [1.999999, 0.999999]`
- **Objective Value:**
  `-2.999998`
- **Inequality Constraints at x*:**
  - Constraint 1: `c₁(x*) = -1.999998`
  - Constraint 2: `c₂(x*) = -0.000000999997129`
  - Constraint 3: `c₃(x*) = -0.000000999998110`
  - Constraint 4: `c₄(x*) = -0.999999`

Central Path Plot:



Objective Function Plot: