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ENMT-4620 / Week 3 / hw3_sqp.py

ejbkdb Update hw3_sqp.py

`e207bf3` 21 hours ago

1 contributor

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68 lines (40 sloc) 1.16 KB

```
1  import matplotlib.pyplot as plt
2  import numpy as np
3
4  from scipy.optimize import minimize_scalar
5
6
7
8
9  def obj(x):
10     return 5 - x + 0.45 * x**2 -0.08**3 +0.005*x**4
11
12 # def obj(x):
13 #     return 5 - 20*x + 0.45 * x**2 -0.08**3
14
15 # res = minimize_scalar(obj, bounds = (-100,100), method= 'bounded')
16 # print('scipy_min=',res.x)
17
18 def nextguess(x1, x2, x3, xstar):
19     x = np.matrix([[x1],[x2],[x3]])
20     max_pos = np.argmax(np.asarray(abs(xstar[0] - x)))
21
22     if max_pos == 0:
23         return x2,x3, xstar[0]
24     if max_pos == 1:
25         return x1,xstar[0],x3
26     if max_pos == 2:
27         return xstar[0],x1,x2,
28 def p(x,C):
29     C = np.squeeze(np.asarray(C))
30     return C[0]*x**2 + C[1]*x + C[2]
31
32
33 x1 = 25
```

```
x2 = 50
x3 = 75


xstar=[]
eq = []


for i in range (1,20):


    F = np.matrix([[obj(x1)],
                   [obj(x2)],
                   [obj(x3)]])

    X = np.matrix([[x1**2, x1, 1],
                   [x2**2, x2, 1],
                   [x3**2, x3, 1]])

    C = np.matmul(X.I,F)

    eq.insert(0,C)

    xstar.insert(0,-C.item(1)/2/C.item(0))

    x1,x2,x3 = nextguess(x1,x2,x3,xstar)

    if len(xstar) > 1:
        if abs(obj(xstar[0]) - obj(xstar[1])) < 0.1:
            break
```