

[실습예제 26-2][도전!]

```
1 import numpy as np
2 import matplotlib.pyplot as plt
3
4 ff = lambda x, y: 3*(x-6)**2 + (y-5)**2
5 fx = lambda x, y: 6*(x-6)
6 fy = lambda x, y: 2*(y-5)
7
8 ox, oy = 1, 1
9 MaxIter = 50
10 alpha = 0.5
11 rho1, rho2, delta = 0.9, 0.99, 1e-7
12
13 sx, sy = 0, 0
14 rx, ry = 0, 0
15 xp, yp = np.zeros(MaxIter+1), np.zeros(MaxIter+1)
16 xp[0], yp[0] = ox, oy
17 for n in range(MaxIter):
18     gradx, grady = fx(ox,oy), fy(ox,oy) # Compute Gradients
19     sx, sy = rho1*sx+(1-rho1)*gradx, rho1*sy+(1-rho1)*grady
20     rx, ry = rho2*rx+(1-rho2)*gradx**2, rho2*ry+(1-rho2)*grady**2
21     hsx, hsy = sx/(1-rho1**(n+1)), sy/(1-rho1**(n+1))
22     hrx, hry = rx/(1-rho2**(n+1)), ry/(1-rho2**(n+1))
23     nx = ox - alpha/(delta+np.sqrt(hrx))*hsx
24     ny = oy - alpha/(delta+np.sqrt(hry))*hsy
25     ox, oy = nx, ny # Update Iteration
26
27     xp[n+1], yp[n+1] = ox, oy
28
29 xx, yy = np.meshgrid(np.linspace(0,10), np.linspace(0,10))
30 fig = plt.figure()
31 ax = plt.axes()
32 ax.contour(xx, yy, ff(xx,yy), 20, cmap='jet')
33 ax.set_aspect('equal', adjustable='box')
34 plt.plot(6, 5, 'rs')
35 plt.plot(xp, yp, 'ko--')
36 plt.show()
```

