Assignment-11

18K41A0479

Nestrov accelerated gradient (NAG) optimiser

Sample(i)	x_i^a	y_i^a
1	0.2	3.4
2	0.4	3.8
3	0.6	4.2
4	0.8	4.6

Do manual calculations for 2 iterations with 1st 2 samples.

step-1: [X, Y], $m=1$, $c=-1$, $\eta=0.1$, epoches = 2, $\gamma=0.9$,

$v_m = v_c = 0$, $n_s = 2$

2. ibr=1

3. sample=1

4. $g_m = \frac{\partial \epsilon}{\partial m} = -(y_i - (m+\gamma v_m)x_i - (c+\gamma v_c)x_i$

$= -0.84$

$g_c = \frac{\partial \epsilon}{\partial c} = -(y_i - (m+\gamma v_m)x_i - (c+\gamma v_c))$

$= -4.2$

5. $v_m = \gamma v_m - \eta g_m$

$= (0.9)0 - (-0.1) \times (-0.84)$

$= -0.084$

$v_c = \gamma v_c - \eta g_c$

$(0.9)0 - (-0.1)(-4.2)$

$= -0.42$

6. $m_t = v_m$

$1 - 0.084 = 0.916$

$c_t = v_c = -1 - 0.42$

$= -1.42$

7. sample t = 1

1 + 1 = 2

8. if (sample > n_s)

step-9

else

step-4

9. $g_m = \frac{\partial e}{\partial m} = -(3.8 - (0.916 + (0.9 \times -0.089)))$

$0.4 - (-1.42 + (0.98 - 0.0034) \cdot 0.4)$

$= -1.983$

$g_c = \frac{\partial e}{\partial c} = -4.959$

5. $v_m = \partial v_m - \eta g_m$

$= (0.9 \times -0.084) - (-0.1 \times -1.983)$

$= -0.273$

$v_c = (0.9 \times -0.42) - (-0.1 \times -4.959)$

$= 0.8739)$

6. $m_t = v_m$

$= 0.916 - 0.2739$

$= 0.6421$

$c_t v_c$

$= -1.42 - 0.8739$

$= -2.2939$

7. sample + = 1
   1+2 = 3

8. If (sample > n_s)
   goto step 9
   2 > 2
   else
   step 3

3. sample = 1

4. $\frac{\partial \epsilon}{\partial m} = g_m = -1.81$

   $g_c = \frac{\partial \epsilon}{\partial c} = -5.85$

5. $v_m = \gamma v_m - \eta g_m$

   $[(0.9) \cdot (-0.273)] - (-0.1 \times -1.81)$

   $= -0.3627$

   $v_c = v_c \gamma - \eta g_c$

   $= (0.9)(-0.873) - (-0.1)(-5.859)$

   $= -1.3707$

6. $m_t = v_m$

   $0.642 + (-0.3627)$

   0.2794

   $C_t = v_c$

   $= -2.2939 - 1.3707$

   $= -3.6646$

7. sample + = 1
   1+1 = 2

8. If (sample > n_s)
   goto step 9
   else
   goto step 4

step 4: $g_m = \frac{\partial E}{\partial m} = -(3.8 - (0.279 + (0.9x - 0.3627))x$

$0.4 - (-3.6646 + (0.9))$

$= -2.985$

$g_c = \frac{\partial E}{\partial c} = -7.4645$

5. $V_m = [0.9 \times -0.3627] - [-0.1 \times -2.985]$

$= -0.6249$

$V_c = [0.9 \times -1.3707] - [-0.1 \times 7.4645]$

$= -1.9800$

6. $m_t = V_m$

$0.2974 + (-0.6249)$

$= -0.3275$

$c_t = V_c = -3.6646 - 1.9800$

$= -4.6446$

7. sample + = 1

2+1=3

8. if (sample > n)

goto step-9

else goto step-4

9. itr + = 1

2+1=3

10. if (itr > epoches)

goto step-4

else

goto step-3

11. print m, c

m = 0.3275

c = -4.6446 //