Assignment-II

1) [x, y], epochs = 2, $\eta = 0.1$, $\beta = 0.9$, m = 1, c = -1,
$v_m = v_c = 0$; ns = 2

x	y
0.2	3.4
0.4	3.8

2) it = 1

3) sample = 1

4) $g_m = \frac{\partial E}{\partial m} = -[2.4 - (1 + 0.9(0))\,0.2 - (-1 + 0.9(0))]\,0.2$

$= -[3.4 - 1(0.2) - (-1)]\,0.2$

$= -0.84$

$g_c = \frac{\partial E}{\partial c} = -[3.4 - (1 + 0.9(0))\,0.2 - (-1 + 0.9(0))]$

$= -4.2$

5) $v_m = 0.9(0) - 0.1(-0.84)$

$= 0.084$

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

$= 0.42$

6) $m = m + v_m = 1 + 0.084 = 1.084$

$c = -1 + 0.42 = -0.58$

7) Sample = 1 + 1 = 2

8) if (2 > 2) ↗

↳ 4) $g_m = \frac{\partial E}{\partial m} = -[3.8 - (1.08 + 0.9(0.08))0.4 - (-0.58 + 0.9(0.42))]\,0.4$

$= -[3.8 - 1.152 \times 0.4 - (-0.28)]0.4$

$= -[3.8 - 0.46 + 0.28]0.4$

$= -1.446$

$g_c = \frac{\partial E}{\partial c} = -[3.8 - (1.08 + 0.9(0.04))0.4 - (-0.58 + 0.9(0.042))]$

$= -[3.8 - 1.152 \times 0.4 + 0.52]$

$= -3.854$

5) $v_m = 0.9(0.04) - 0.1(-1.44)$

$= 0.072 + 0.144$

$= 0.216$

$v_c = 0.9(0.48) - 0.1(-3.854)$

$= 0.037 + 0.3854)$

$= 0.432$

6) $m = 1.064 + 0.216 = 1.29$

$c = -0.56 + 0.432 = +0.172$

7) Sample = 2+1 = 3

8) If (3>2) ✓

9) it = it+1 = 1+1 = 2

10) if (2>2) ✗

↳ 3) Sample = 1

4) $g_m = \frac{\partial E}{\partial m} = -[3.4 - (1.29 + 0.9(0.21))\,0.2 - (+0.17 + 0.9(0.43))]\,0.2$

$= -[3.4 - 1.508 \times 0.2 - 0.89]\,0.2$

$= -[3.4 - 0.3016 - 0.89]\,0.2$

$= -0.475$

$g_c = \frac{\partial E}{\partial c} = -[3.4 - (1.31 + 0.9(0.22))\,0.2 - (-0.13 + 0.9(0.42))]$

$= -[3.4 - 0.3016 - 0.89]$

$= -2.29$

5) $v_m = 0.9(0.21) - 0.1(-0.475)$

$= 0.198 + 0.0475 = 0.245$

$v_c = 0.9(0.43) - 0.1(-2.29)$

$= 0.387 + 0.229 = 0.884$

6) $m = 1.29 + 0.245 = 1.56$

$c = +0.178 + 0.884 = 1.05$

7) Sample = 1 + 1 = 2

8) if (2 > 2) x

↳ 4) $g_m = \frac{\partial E}{\partial m} =$

$-[3.8 - (1.56 + 0.9(0.24))\,0.4 - (1.05 + 0.9(0.88))]\,0.4$

$= -[3.8 - 1.78 \times 0.4 - 1.842]0.4$

$= -[3.8 - 0.712 - 1.842]0.4$

$= -0.498$

$g_c = \frac{\partial E}{\partial c} = -[3.8 + 0.9(0.24))0.4 - (1.05 + 0.9(0.88)$

$= -[3.8 - 0.712 - 1.842]$

$= -1.24$

5) $v_m = 0.9(0.24) - 0.1(-0.498)$

$= 0.225 + 0.049$

$= 0.274$

$v_c = 0.9(0.88) - 0.1(-1.24)$

$= 0.792 + 0.124$

$= 0.916$

6) $m = 1.56 + 0.274 = 1.834$

$c = 1.05 + 0.916 = 1.96$

7) Sample = 2+1 = 3

8) if (sample > ns)

3 > 2 ✓

9) $it = 2+1 = 3$

10) if (3 > 2) ✓

11) $m = 1.834$, $c = 1.96$.