Assignment - 13

1) [x, y], epochs = 2, m = 1, c = -1,
$G_m = G_c = 0$, $\eta = 0.1$, $\varepsilon = 10^{-8}$

x	y
0.2	3.4
0.4	3.8

2) i = 1

3) Sample = 1

4) $q_m = -[3.4 - 1(0.2) + 1]0.2$

$= -0.64$

$q_c = -(3.4 - 1(0.2) + 1) = -4.2$

5) $G_m = G_m + (q_m)^2 = 0 + (-0.64)^2 = 0.705$

$G_c = G_c + (q_c)^2 = 0 + (-4.2)^2 = 17.64$

6) $\Delta m = \frac{-\eta}{\sqrt{G_m + \varepsilon}} q_m = \frac{-0.1}{\sqrt{0.705 + 10^{-8}}} (-0.64)$

$= \frac{0.064}{0.83} = 0.10$

$\Delta c = \frac{-\eta}{\sqrt{G_c + \varepsilon}} q_c = \frac{-0.1}{\sqrt{17.64 + 10^{-8}}} (-4.2)$

$= \frac{0.42}{4.2} = 0.1$

7) $m = m + \Delta m = 1 + 0.1 = 1.1$

$c = c + \Delta c = -1 + 0.1 = -0.9$

8) Sample = 1 + 1 = 2

3) If (2>2) ✗

↳ 4) $g_m = -[3.8 - 1.1(0.4) + 0.9]0.4$

$= -[3.8 - 0.44 + 0.9]0.4$

$= -1.704$

$g_c = -[3.8 - 1.1(0.4) + 0.9]$

$= -[4.26]$

5) $G_m = G_m + (g_m)^2 = 0.705 + (-1.704)^2$

$= 0.705 + 2.903$

$= 3.60$

$G_c = G_c + (g_c)^2 = 17.64 + (-4.26)^2$

$= 17.64 + 18.1476$

$= 35.78$

6) $\Delta m = -\frac{0.1}{\sqrt{3.6 + 10^{-8}}}(-1.704)$

$= \frac{0.170}{1.89} = 0.089$

$\Delta c = -\frac{0.1}{\sqrt{35.78 + 10^{-8}}}(-4.26)$

$= \frac{0.426}{5.981} = 0.071$

7) $m = 1.1 + 0.089 = 1.189$

$c = -0.9 + 0.071 = -0.829$

8) Sample = 2+1 = 3

9) if (3>2) ✓

10) qt = 1+1 = 2

11) if (2>2) ✗

↳ 3) Sample = 1

4) $q_m = -[3.4 - 1.18(0.2) + 0.62)0.2$

$= -(3.4 - 0.236 + 0.62)0.2$

$= -0.796$

$q_c = -(3.4 - 1.18(0.2) + 0.62)$

$= -3.98$

5) $G_m = 3.6 + (-0.796)^2$

$= 3.6 + 0.6336 = 4.23$

$G_c = 35.78 + (-3.98)^2$

$= 35.78 + 15.840$

$= 51.62.$

6) $\Delta m = \frac{-0.1}{\sqrt{4.23 + 10^{-8}}}(-0.796)$

$= \frac{(0.079)}{2.05} = 0.038$

$\Delta c = \frac{-0.1}{\sqrt{51.62 + 10^{-8}}}(-3.98)$

$= \frac{0.398}{7.184} = 0.055$

7) $m = 1.18 + 0.038$

$m = 1.138$

$c = -0.829 + 0.055$

$c = -0.745$

8) Sample $= 1 + 1 = 2$.

9) if $(2 > 2)$ x

10) ↳ 4) $q_m = -(3.8 - 1.13(0.4) + 0.74)0.4$

$= -(3.8 - 0.452 + 0.74)0.4$

$= -1.635$

$q_c = -(3.8 - 1.13(0.4) + 0.74)$ 4.0

$= -4.068$

5) $G_m = G_m + (q_m)^2 = 4.23 + (-1.635)^2$

$= 4.23 + 2.673$

$= 6.903$

$G_c = G_c + (q_c)^2 = 51.62 + (-4.068)^2$

$= 51.62 + 16.64$

$= 68.26$

6) $\Delta m = \frac{-0.1}{\sqrt{6.903 + 10^{-6}}}(-1.635)$

$= \frac{0.163}{83.064} = 0.0019$

$\Delta c = \frac{-0.1}{\sqrt{68.26 + 10^{-6}}}(-4.068)$

$= \frac{0.4068}{8.2619} = 0.049$

9) $m = 1.138 + 0.0019$

$= 1.1319$

$C = -0.745 + 0.049$

$= -0.696$

8) Sample = 2+1 = 3

9) if (3 > 2) ✓

10) it = 2+1 = 3

11) if (3 > 2) ✓

12) m = 1.1319, c = −0.696