

5)

~~minimize~~ $(x) \quad (y)$

75.1 577.8

74.3 577

88.7 570.9

Iteration = 1

$\eta = 0.1 \quad m = 1 \quad c = -1$

$$\frac{\partial e}{\partial m} = -\frac{1}{2} \left[(c y_{a1} - m x_1 - c)^* x_1 + (c y_{a2} - m x_2 - c)^* x_2 + (c y_{a3} - m x_3 - c)^* x_3 \right]$$

$$= -(0.5) \left[(c 577.8 - (1)(75.1) + 1)^* 75.1 + (c 577 - (1)(74.3) + 1)^* 74.3 + (c 570.9 - (1)(88.7) + 1)^* 88.7 \right]$$

$$= -(0.5) \left[(37827.87) + (37424.91) + (42859.84) \right]$$

$$= -(0.5) (118112.62)$$

$$= 59056.31$$

$$\frac{\partial \epsilon}{\partial C} = -\frac{1}{2} \left[(577.8 - (75.1) + 1) + (577 - (11)(74.3) + 1) + (570.9 - (11)(88.7) + 1) \right]$$

$$= -(0.5)(503.7 + 503.7 + 483.2)$$

$$= -0.5(1490.6) = -745.3$$

$$\Delta m = -\eta \frac{\partial \epsilon}{\partial m} = -(0.1)(-59056.31) = 5905.631$$

$$\Delta C = -\eta \frac{\partial \epsilon}{\partial C} = -(0.1)(-745.3) = 74.53$$

$$m = 1 + 5905.631 = 5906.631$$

$$C = -1 + 74.53 = 73.53$$

Iteration - 2 Now $m = 5906.631$ $C = 73.53$

$$\begin{aligned} \frac{\partial \epsilon}{\partial m} = & -(0.5) \left[((577.8 - (5906.631)(75.1) - 73.53) \cdot 75.1) + ((577 - (5906.631)(74.3) - 73.53) \cdot 74.3) \right. \\ & \left. + ((570.9 - (5906.631)(88.7) - 73.53) \cdot 88.7) \right] \\ = & -(0.5) [(504.21 - 443587.988) \cdot 75.1) + \end{aligned}$$

$$(503.47 - 438,862.683) * 74.3 +$$

$$(497.37 - 523918.17) * 88.7)$$

$$\Rightarrow -(0.5) ((-443083.718) * (75.1) +$$

$$(-438359.213) * 74.3 + (-523420.8) * 88.7)$$

$$= + (0.5) (33275587.2 + 32570089.5 +$$

$$= 0.5 \times 112273102 + 56136551$$

$$\frac{\partial E}{\partial C} = -\frac{1}{2} [\text{crossed out terms}]$$

$$-(443083.718 + 438359.213 +$$

$$523420.8)$$

$$= (0.5) (1404863.73)$$

$$= 702431.865$$

$$\Delta m = \text{crossed out term} - (0.1) (56136551)$$

$$= -56136551$$

$$\Delta C = -(0.1) (702431.865)$$

$$= -702431.865$$

~~mass~~

$$m = 5906.631 + (-56136551)$$

$$= -56130650.4$$

$$C = 73.53 + (-702431.865)$$

$$= -702358.335$$