CS 472 Linear Regression HW Evan Nuss

x_1	x_2	target
.3	.8	.7
-.3	1.6	-.1
.9	0	1.3

$\vec{\theta} = \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}$

$c = .2 \qquad \Delta\theta_i = c(t - net)x_i$

#1

$net = 0$

$\Delta\theta_0 = .2(.7-0)1$
$= 0.14$

$\Delta\theta_1 = .2(.7-0).3$
$= 0.042$

$\Delta\theta_2 = .2(.7-0).8$
$= 0.112$

$\vec{\theta} = \begin{bmatrix} 0.14 \\ 0.042 \\ 0.112 \end{bmatrix}$

#2

$net = 0.14 + 0.042(-.3) + 0.112(1.6) = .3066$

$\Delta\theta_0 = .2(-.1 - .3066)1$
$= -.08132$

$\Delta\theta_1 = .2(-.1 - .3066)-.3$
$= .024396$

$\Delta\theta_2 = .2(-.1 - .3066)1.6$
$= -.1301$

$\vec{\theta} = \begin{bmatrix} .0587 \\ .0664 \\ -.0181 \end{bmatrix}$

#3

$net = .0587 + .0664(.9) + (-.0181)(0) = .1185$

$\Delta\theta_0 = .2(1.3 - .1185)1$
$= .2365$

$\Delta\theta_1 = .2(1.3 - .1185).9$
$= .2127$

$\Delta\theta_2 = 0$

$\vec{\theta} = \begin{bmatrix} .2952 \\ .2791 \\ -.0181 \end{bmatrix}$

$net_{novel} = .2952 + .2791(1) + (-.0181)(.5)$
$= \boxed{.5653}$