Homework 3 - Linear Regression

Assume all weights start at 0

1) New weights after 1 iteration? $\Delta w_i = c(t - net)\, x_i$ $c = .2$

X_1	X_2	bias	target	net	Δw_1	Δw_2	Δw_3
.3	.8	1	.7	0	.042	.112	.14
-.3	1.6	-1	-.1	.1932	.017592	-.093924	-.05864
.9	0	1	1.3	.1349928	.2097013	0	.23300144

w_1	w_2	w_3
0	0	0
.042	.112	.14
.059592	.018176	.09136
.2691933	.018176	.31436144

$net_1 = .3(0) + .8(0) + 1(0) = 0$

$.2(.7 - 0) = .14$

$\Delta w_1 = .14(.3) = .042$

$\Delta w_2 = .14(.8) = .112$

$\Delta w_3 = .14(1) = .14$

$net_2 = -.3(.042) + 1.6(.112) + 1(.14) = -.0126 + .1792 + .14 = .1932$

$.2(-.1 - .1932) = -.05864$

$\Delta w_1 = -.05864(-.3) = .017592$ $\Delta w_3 = -.05864(1) = -.05864$

$\Delta w_2 = -.05864(1.6) = -.093824$

$net_3 = .9(.059592) + 0(.018176) + 1(.09136) = .0536328 + .08136 = .1349928$

$.2(1.3 - .1349928) = .23300144$

$\Delta w_1 = .23300144(.9) = .2097013$ $\Delta w_3 = .23300144(1) = .23300144$

$\Delta w_2 = .23300144(0) = 0$

	w_1	w_2	w_3
After 1 iteration:	.27	.02	.31
Generalizing (1, .5)	1(.27)	+ .5(.02)	+ 1(.31) = .27 + .01 + .31 = **.59**