CS 557: PATTERN RECOGNITION AND LEARNING
QUIZ 4
FALL 2016

PROBLEM
Given the following SOM grid, with weights for each cell:

$\mathbf{w}_{11} = (0,0,2)$	$\mathbf{w}_{12} = (1,0,0)$
$\mathbf{w}_{21} = (2,2,0)$	$\mathbf{w}_{22} = (2,1,1)$

the neighborhood function for a grid cell at (k,l) is given by: (Here (i,j) are the coordinates of the best matching unit)

$$e(i,j,k,l) = 0.1*(|i-k|+2*|j-l|)$$

the learning rate is given by $\eta = 1$

Update the SOM grid with 1 iteration for the training point (2,3,0)

SOLUTION
(NOTE: Do the working yourself)

Table below shows the neighborhood function for each cell:

0.1	0.3
0	0.2

The following table shows the $\Delta\mathbf{w}_{ij}$ for each cell

0.1(2,3,-2)	0.3(1,3,0)
(0,0,0)	0.2(0,2,-1)

The following table shows the final updated weights $\mathbf{w}_{ij}$

(0.2,0.3,1.8)	(1.3,0.9,0)
(2,2,0)	(2.2,1.4,0.8)