1. What is the magnitude of $\vec{w} = [0.5, 0.5]$?

2. Multiple the following two vectors $(\vec{x} * \vec{w}^T)$, where $\vec{x} = [0.5, 0.5]$ and $\vec{w} = [0.75, 1.25]$

3. Multiple the following two vectors $(\vec{x}^T * \vec{w})$ using the vectors from the previous problem.

4. What is the dot product of $\vec{x}$ and $\vec{w}$ using the values from the previous problem?

5. What is the angle between $\vec{x}$ and $\vec{w}$ using the values from the previous problem? Draw the vectors and label the angle that you found.

6. Add the following vectors, and draw the resultant and the original vectors.
$\vec{x} = [0.5, 0.5]$ and $\vec{w} = [0.75, -1]$

7. What is the difference between prediction and classification?

8. Using the perceptron learning algorithm and a single neuron, find the weights that correctly predict the "OR" function. Continue updating the weights using the algorithm discussed in class until you converge on a correct solution. Show all of your work. The initial weights are $w_0 = 0, w_1 = 0.5, w_2 = -0.5$ and the learning parameter $\nu = 0.25$. You may also assume that $x_0 = 1$.

x_1	x_2	OR
0	0	0
0	1	1
1	0	1
1	1	1