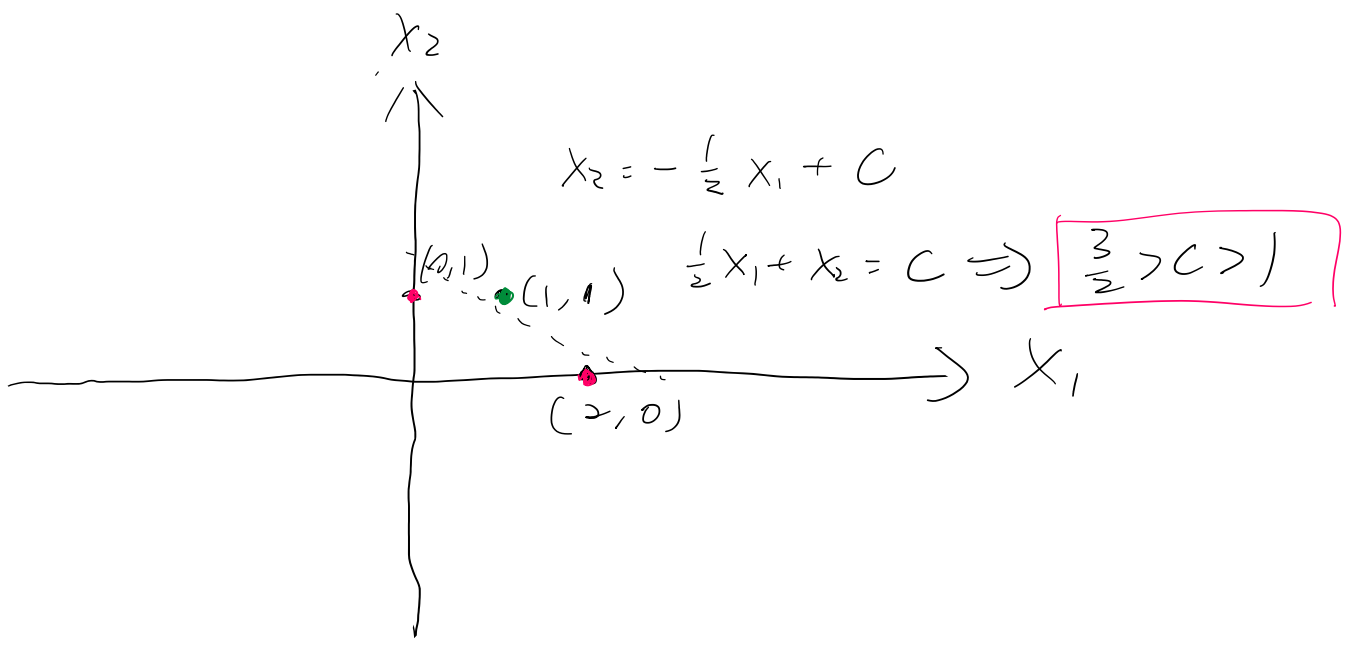
Part 3

Tuesday, 26 January 2021 5:27 pm

Activity 1: Perceptron

a) Construct by hand a Perceptron which correctly classifies the following data; use your knowledge of plane geometry to choose appropriate values for the weights w_0, w_1 and w_2.

Training Example	x_1	x_2	Class
a.	0	1	-1
b.	2	0	-1
c.	1	1	+1



b) Demonstrate the Perceptron Learning Algorithm on the above data, using a learning rate of 1.0 and initial weight values of

$w_0 = -0.5$

$w_1 = 0$

$w_2 = 1$

Iteration	w_0	w_1	w_2	Example	x_1	x_2	Class	$w_0 + w_1x_1 + w_2x_2$	Action
1	−0.5	0	1	a	0	1	−	+0.5	Subtract
2	−1.5	0	0	b	2	0	−	−1.5	None
3	−1.5	0	0	c	1	1	+	−1.5	Add
4	−0.5	1	1	a	0	1	−	+0.5	Subtract
5	−1.5	1	0	b	2	0	−	+0.5	Subtract
6	−2.5	−1	0	c	1	1	+	−3.5	Add
7	−1.5	0	1	a	0	1	−	−0.5	None
8	−1.5	0	1	b	2	0	−	−1.5	None
9	−1.5	0	1	c	1	1	+	−0.5	Add
10	−0.5	1	2	a	0	1	−	+1.5	Subtract
11	−1.5	1	1	b	2	0	−	+0.5	Subtract
12	−2.5	−1	1	c	1	1	+	−2.5	Add
13	−1.5	0	2	a	0	1	−	+0.5	Subtract
14	−2.5	0	1	b	2	0	−	−2.5	None
15	−2.5	0	1	c	1	1	+	−1.5	Add
16	−1.5	1	2	a	0	1	−	+0.5	Subtract
17	−2.5	1	1	b	2	0	−	−0.5	None
18	−2.5	1	1	c	1	1	+	−0.5	Add
19	−1.5	2	2	a	0	1	−	+0.5	Subtract
20	−2.5	2	1	b	2	0	−	+1.5	Subtract
21	−3.5	0	1	c	1	1	+	−2.5	Add
22	−2.5	1	2	a	0	1	−	−0.5	None
23	−2.5	1	2	b	2	0	−	−0.5	None
24	−2.5	1	2	c	1	1	+	+0.5	None