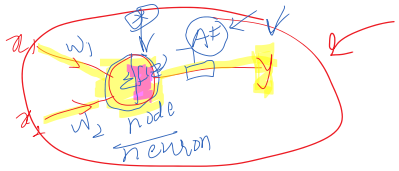
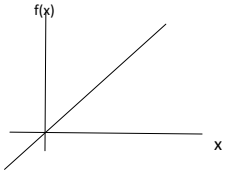


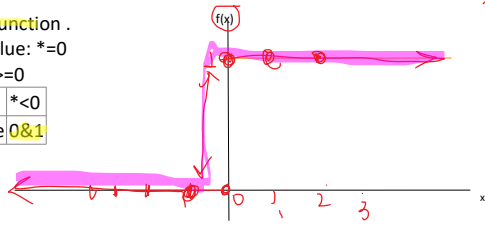
Suppose we don't add a linear function in neural network then in that case every neuron will be performing a linear transformation of weights and bias. It doesn't mattter how many layers we add. The composition of two linear function is always linear.
if neural network is linear then it wont solve the complex problems/task linear function helps to solve simple task/problems..

Linear function
f(x)= x, for all x..
Range of output: (-inf, +inf) any real number.

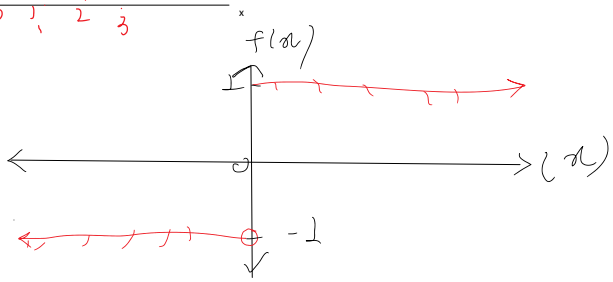


Binary step function .
Threshold value: *=0
F(x)={ 1 *>=0

f(x)={0	*<0
Output range	0&1

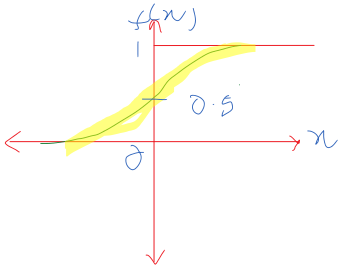


Bipolar step function
Threshold value : *=0
f(x)={1 *>=0
f(x)={-1 *<0
Output range: -1 & 1



Binary sigmoidal function
Output value :
f(x)=1/1+exp(-hx)
-h steepness parameter.

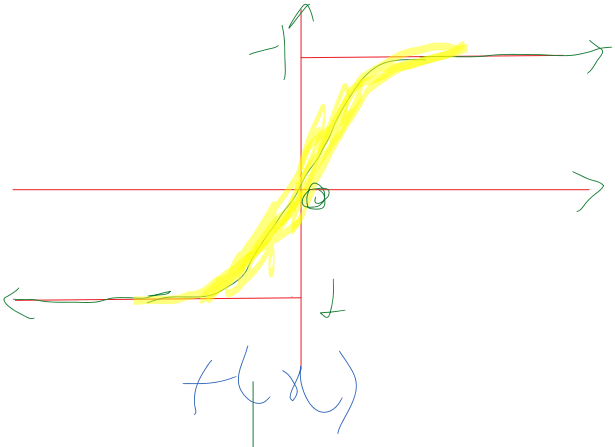
Output range: (0-1) any real number



Bipolar sigmoidal function
f(x)=1-exp(-h)/1+exp(-h)

Tanh(x)=exp(-hx)-exp(-hx)/exp(-hx)+exp(-hx)
Here also h is steepness parameter.

Output range: (-1 -> 1) any real number



Ramp function;

f(x)=
{1 x>1
X 0<=x<=1
0 x<0
}
Output range=[0,1] any real numbers including 0 and 1