

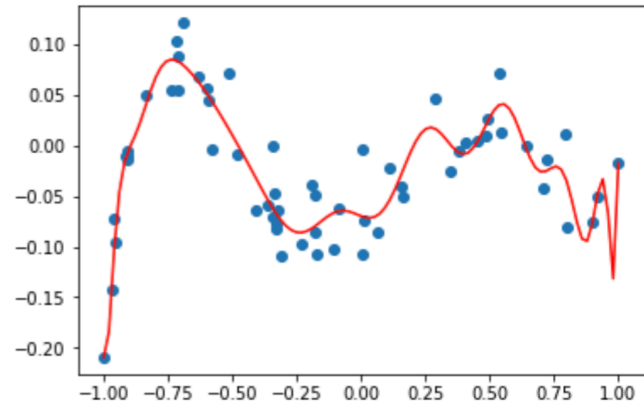
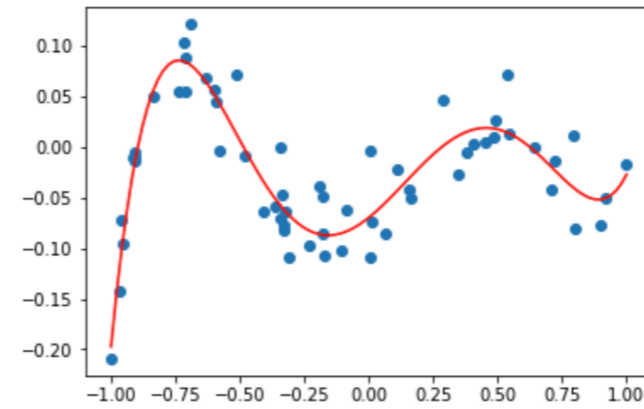
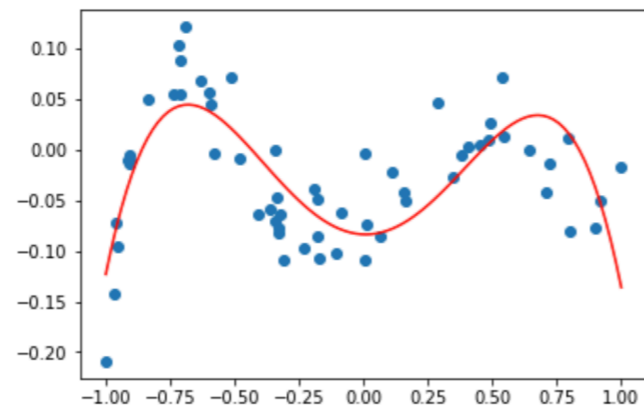
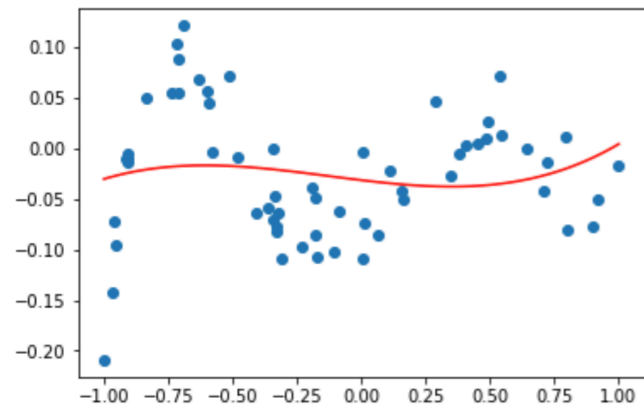
Summary

Sewoong Oh

CSE/STAT 416

University of Washington

1. regression



0.004011490884146126

0.0019177229761741974

0.0007426853089970962

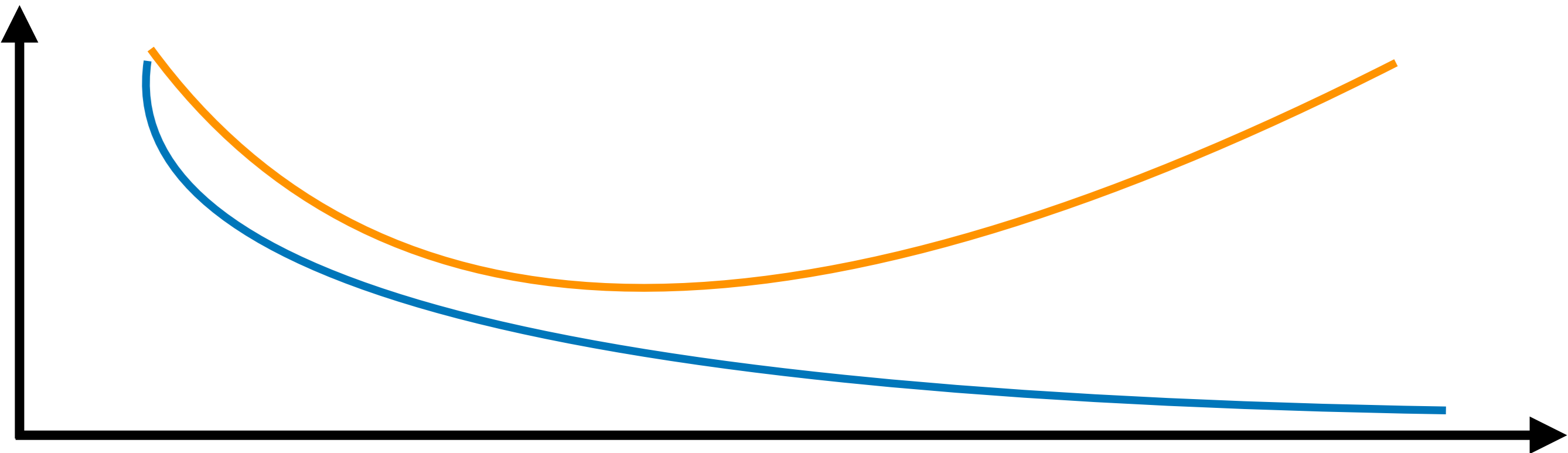
0.0006350545819906561 MSE_{train}

0.003831010290504173

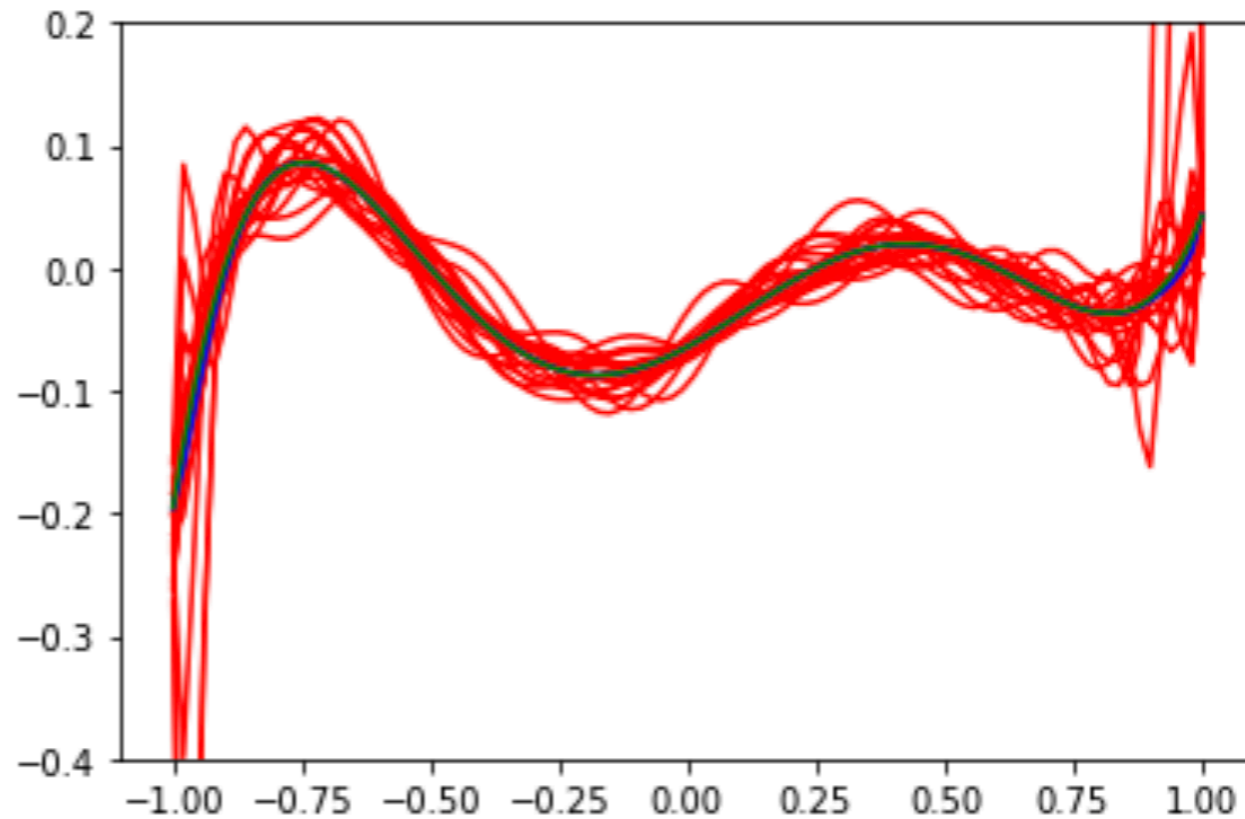
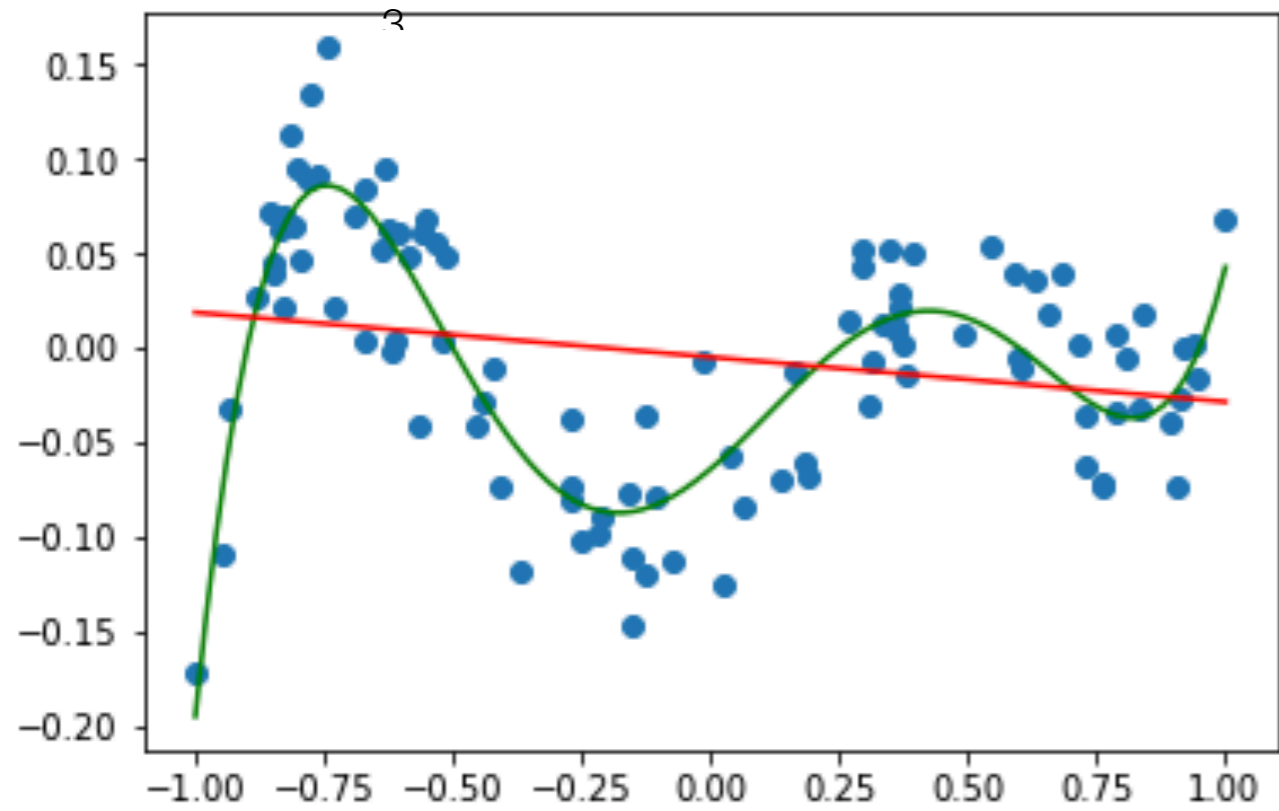
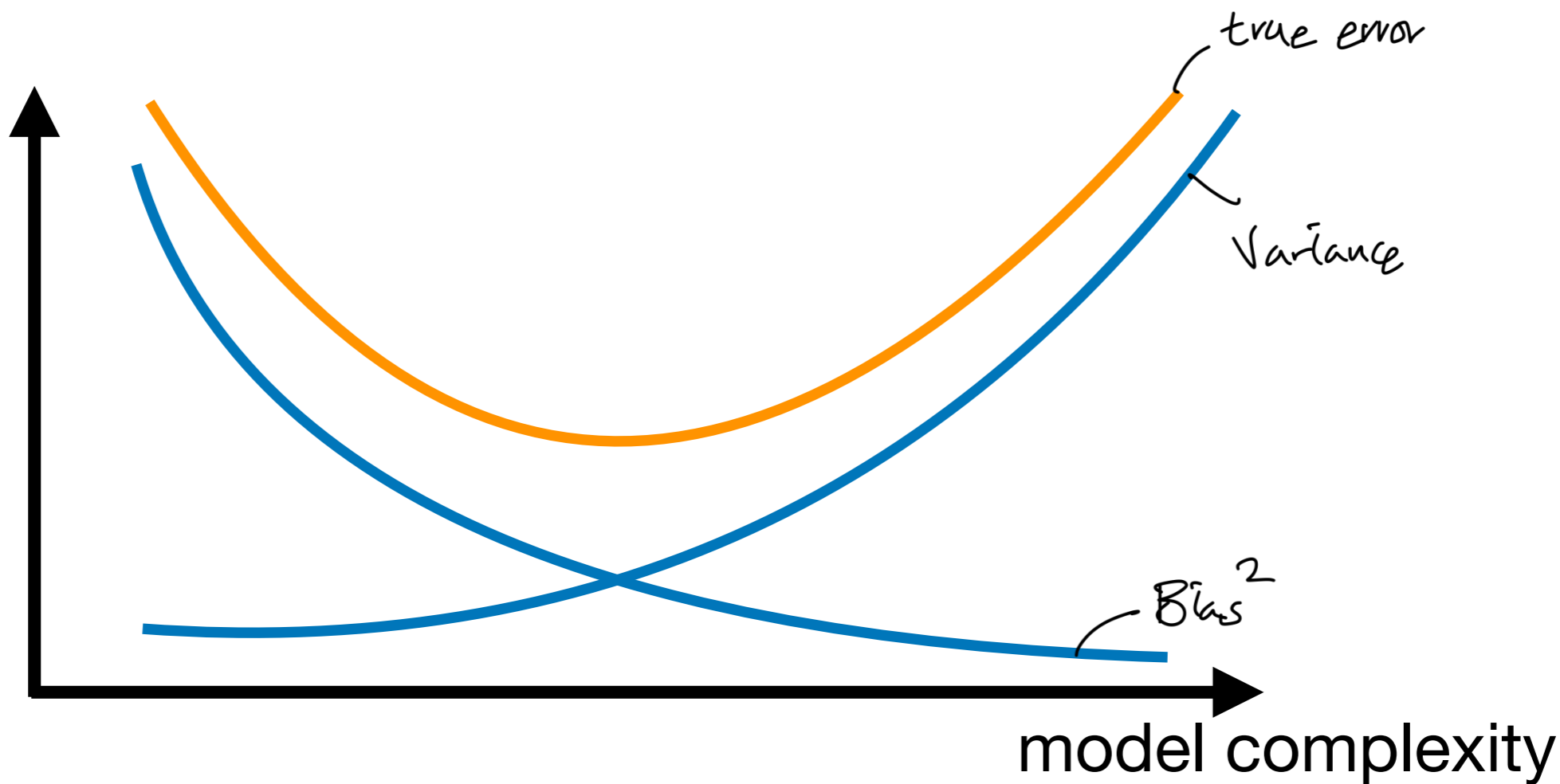
0.002200492720447942

0.0010239915404334238

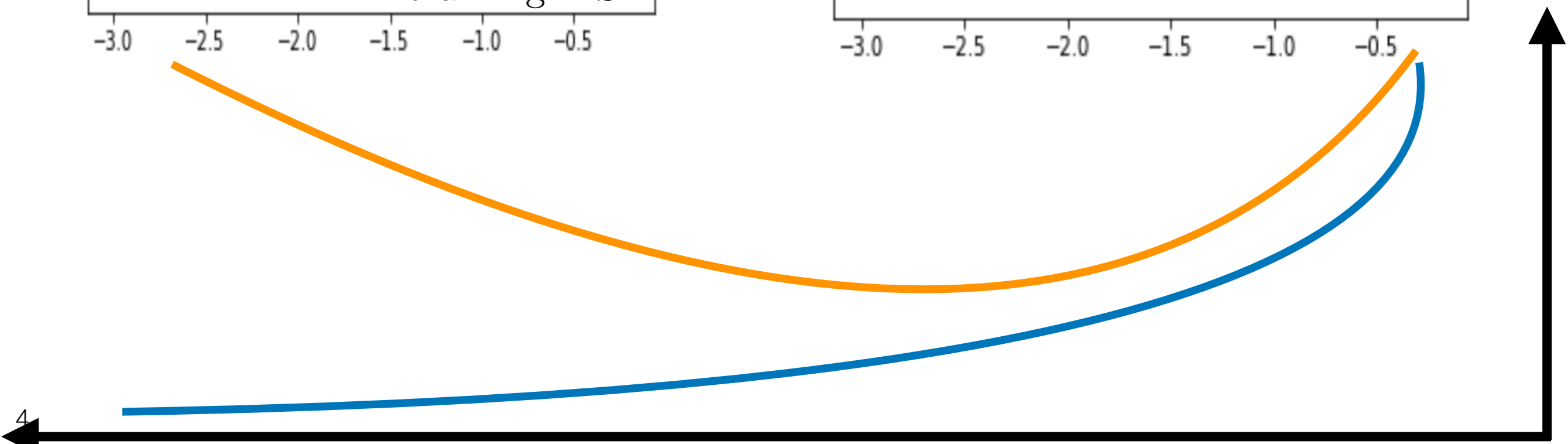
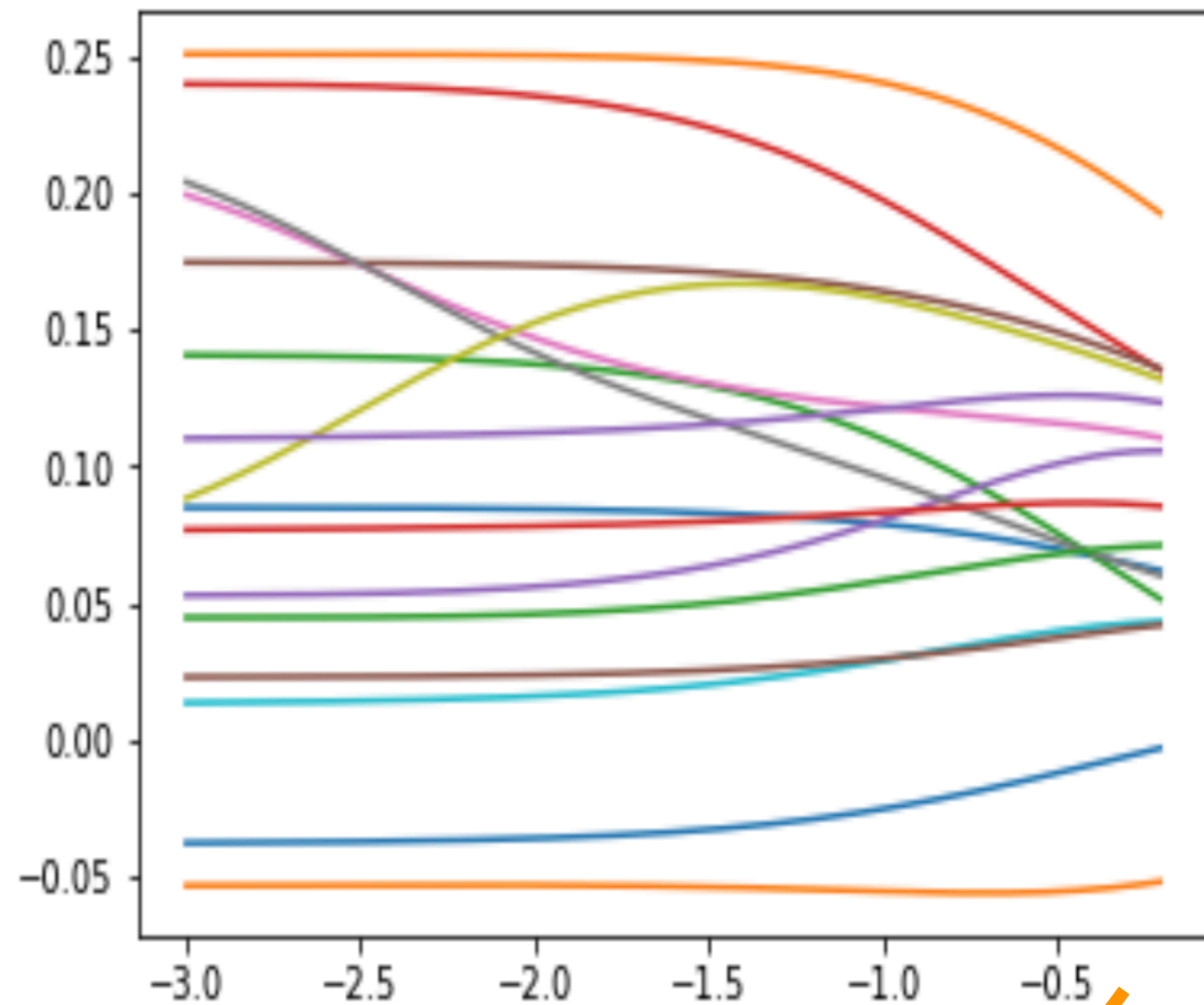
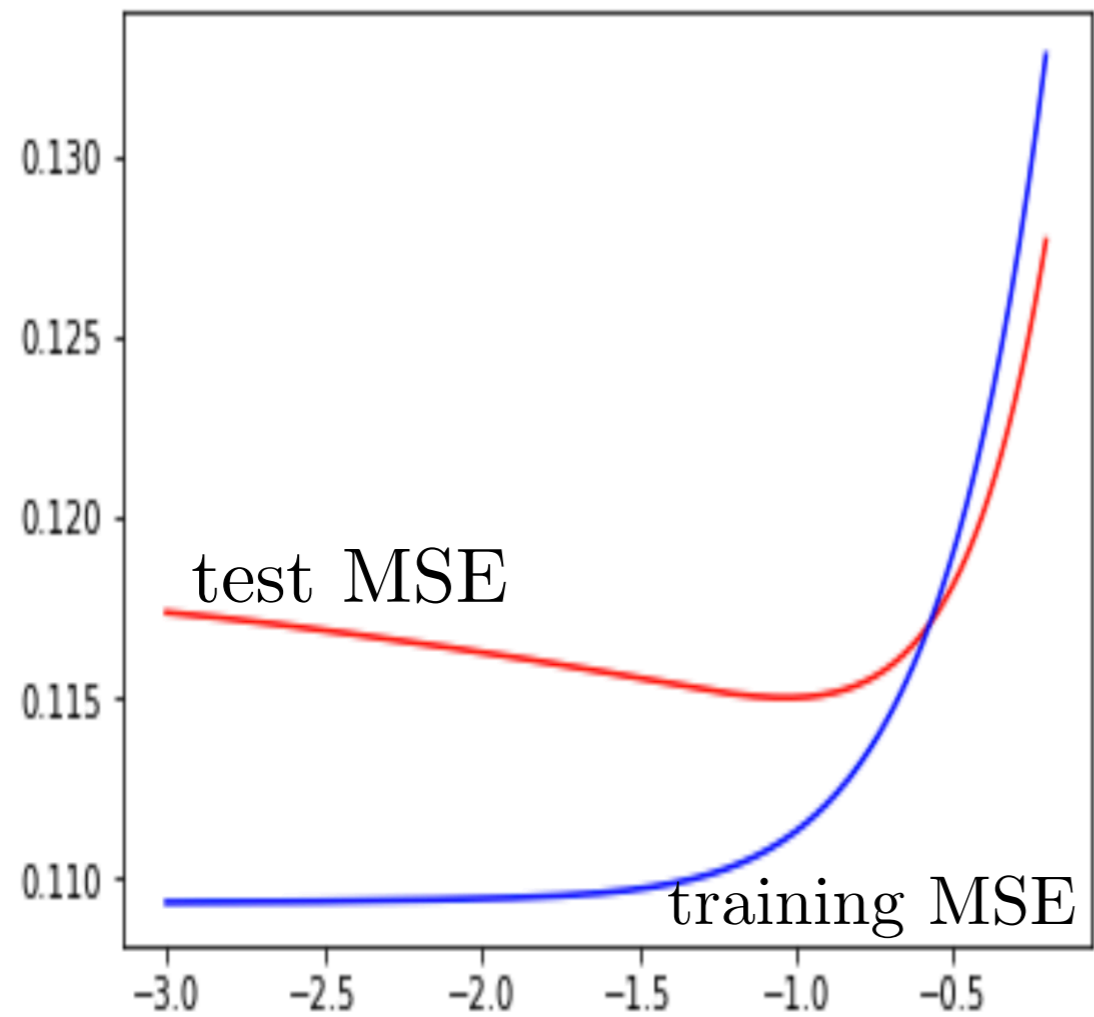
0.0013118370515986446 MSE_{test}



2.validation

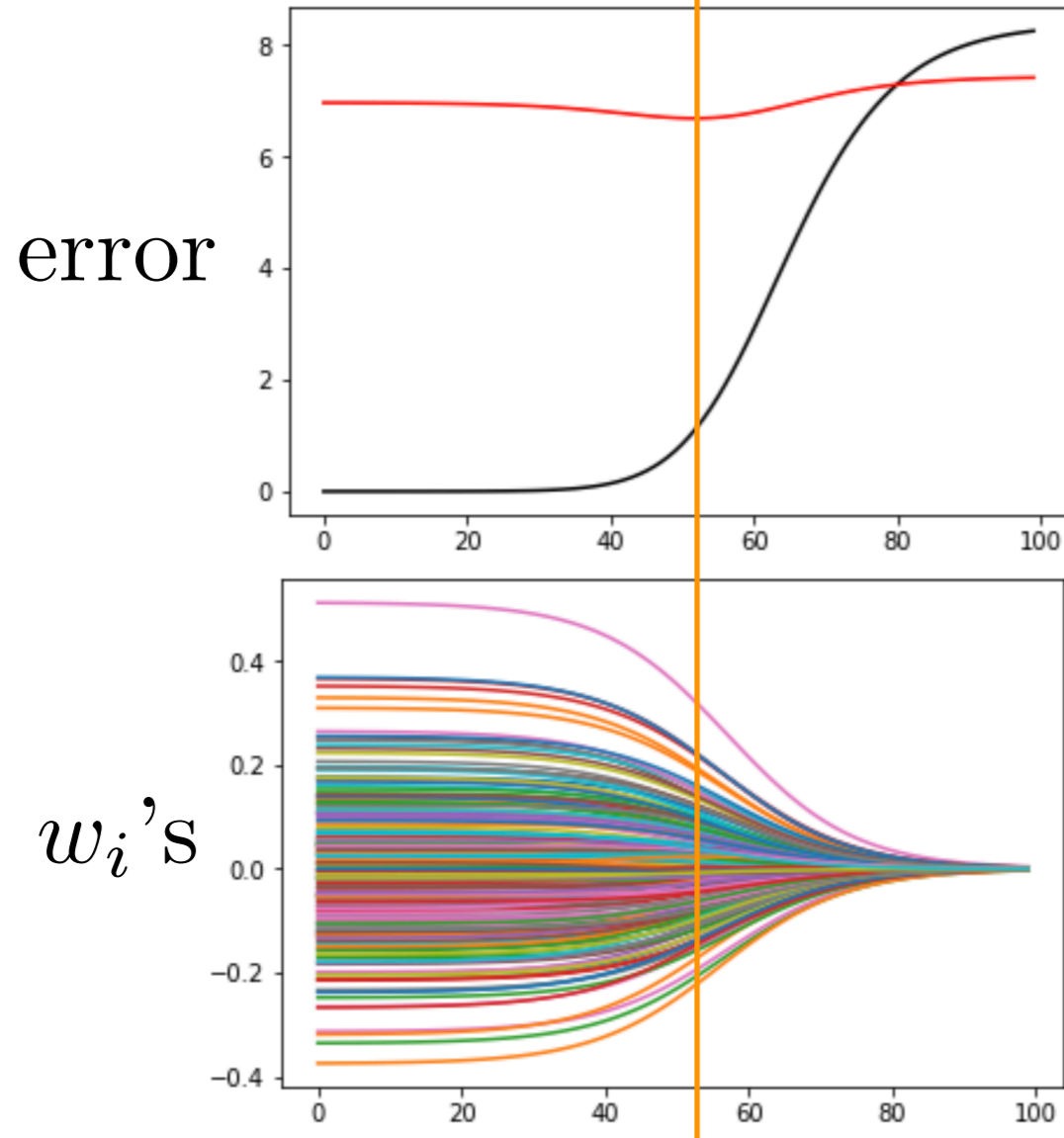


3.regularization

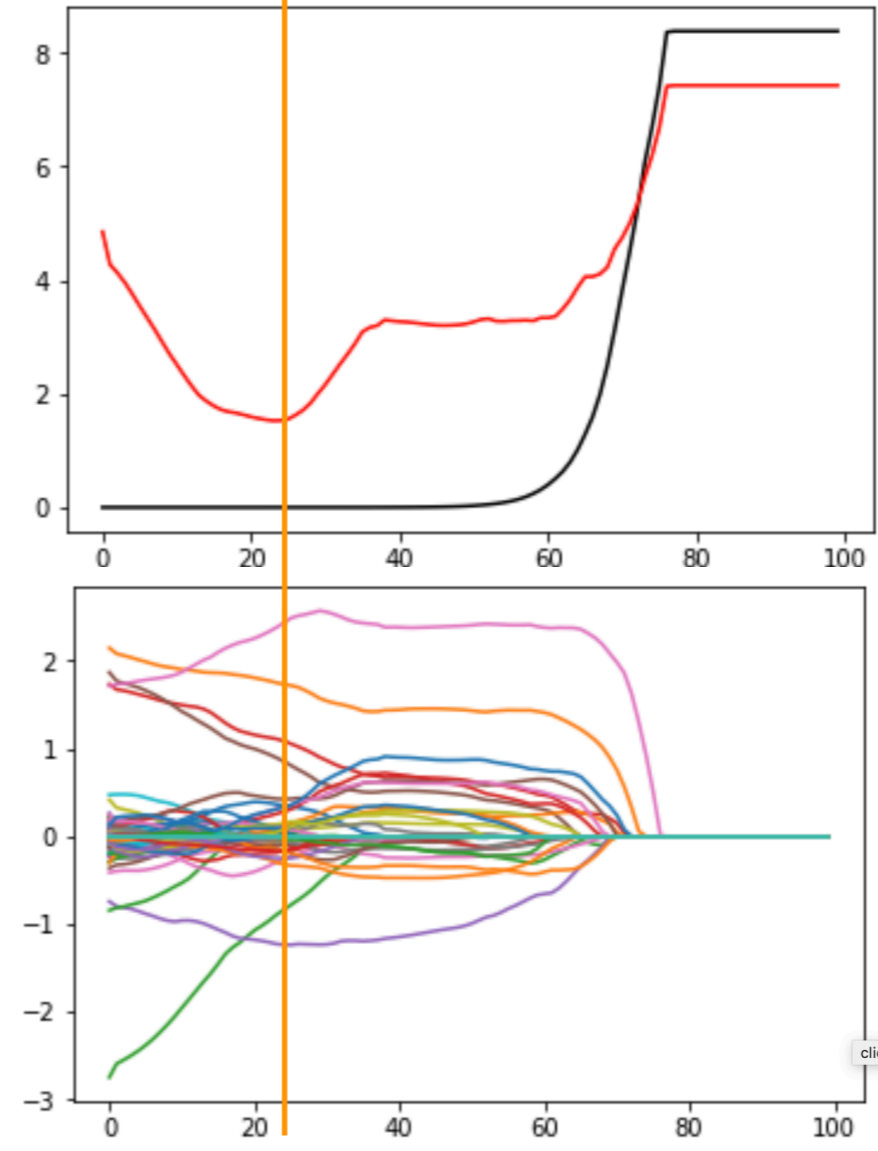


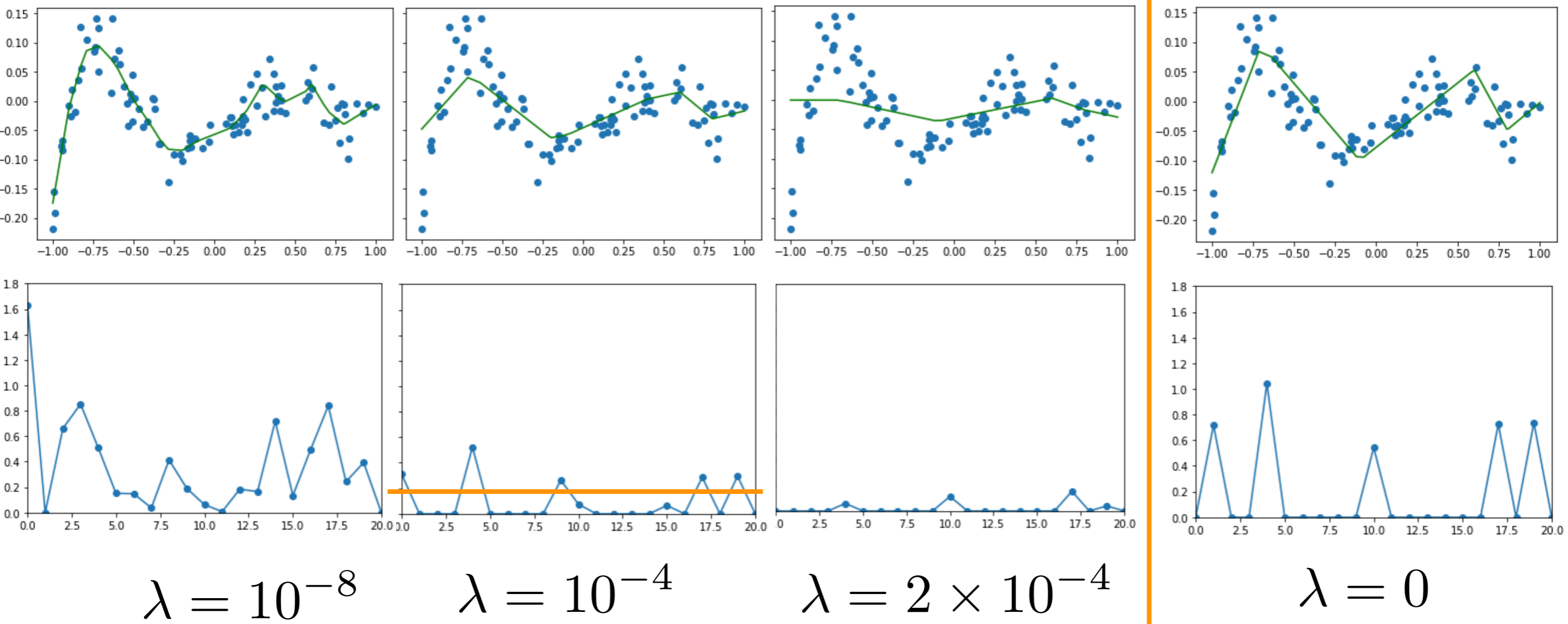
4. non-quadratic regularization

Ridge



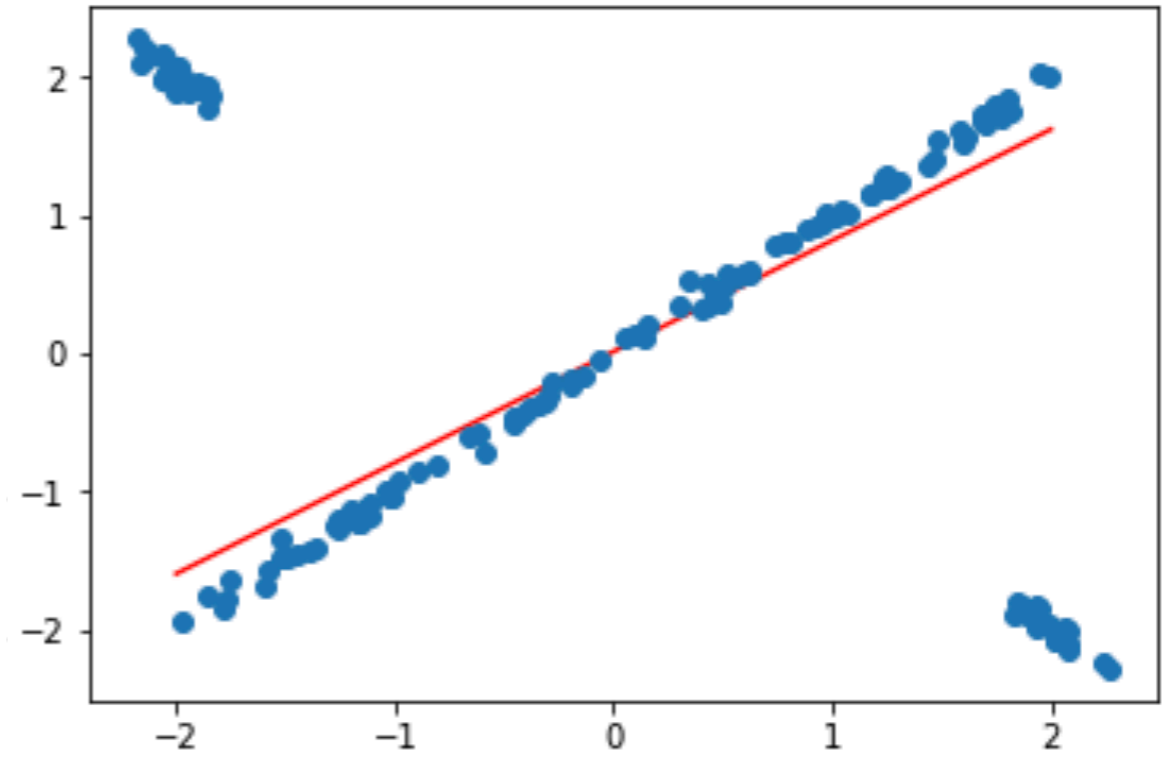
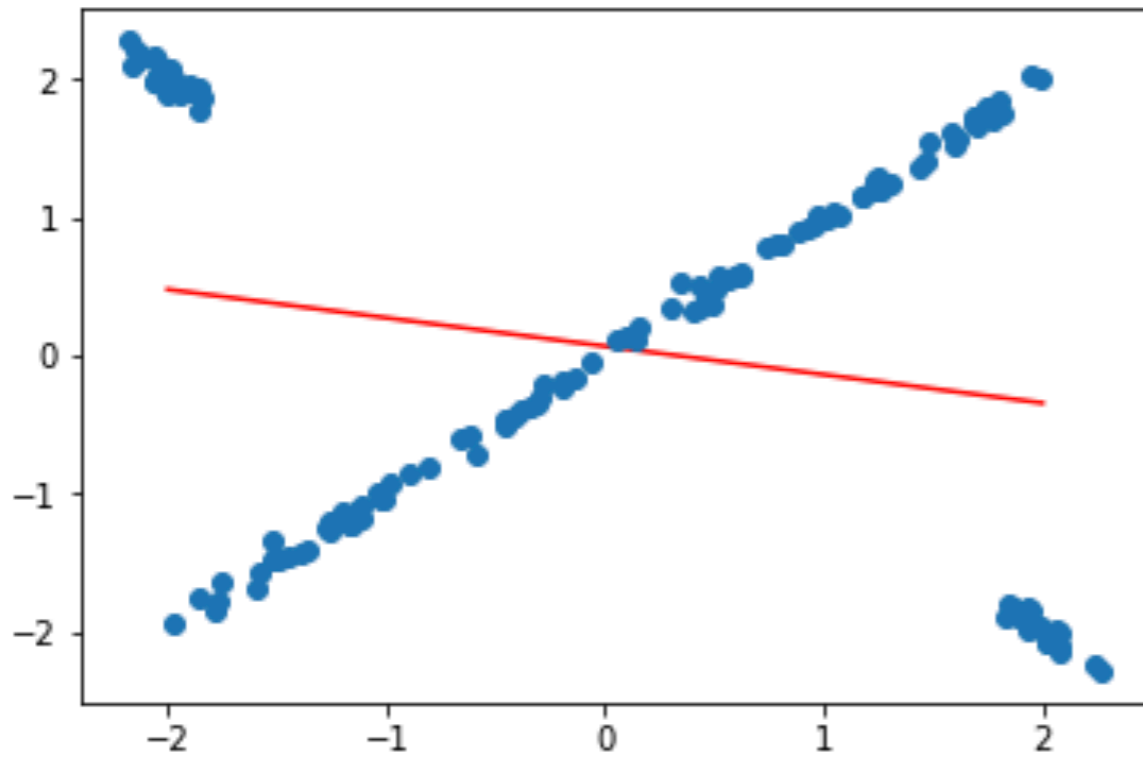
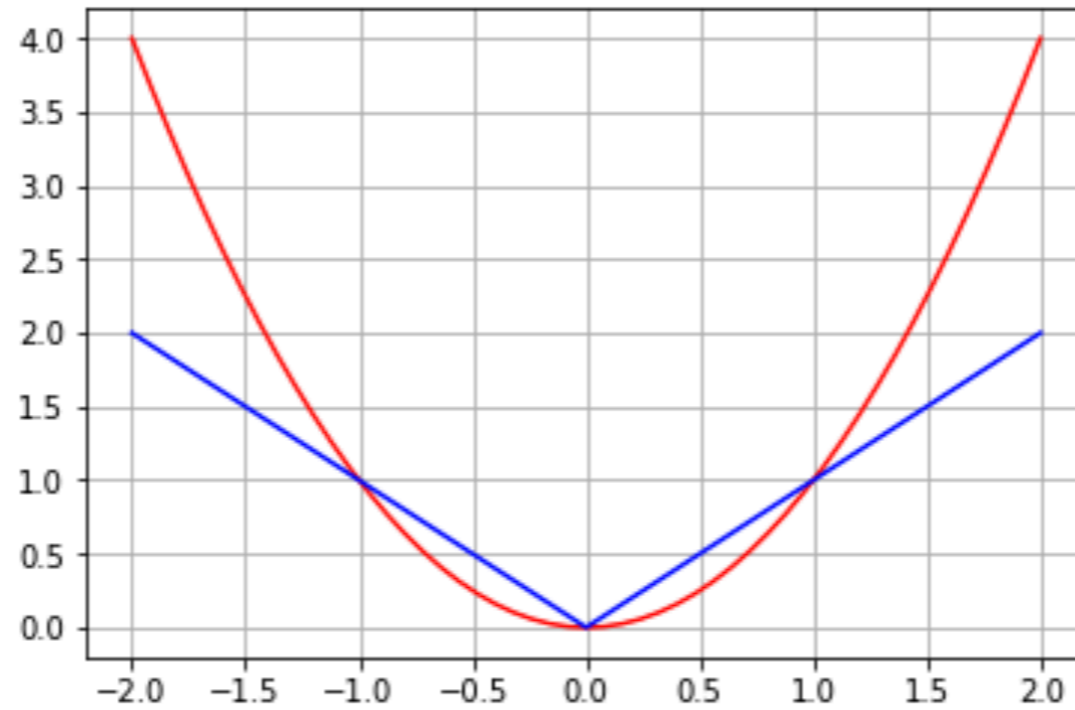
Lasso





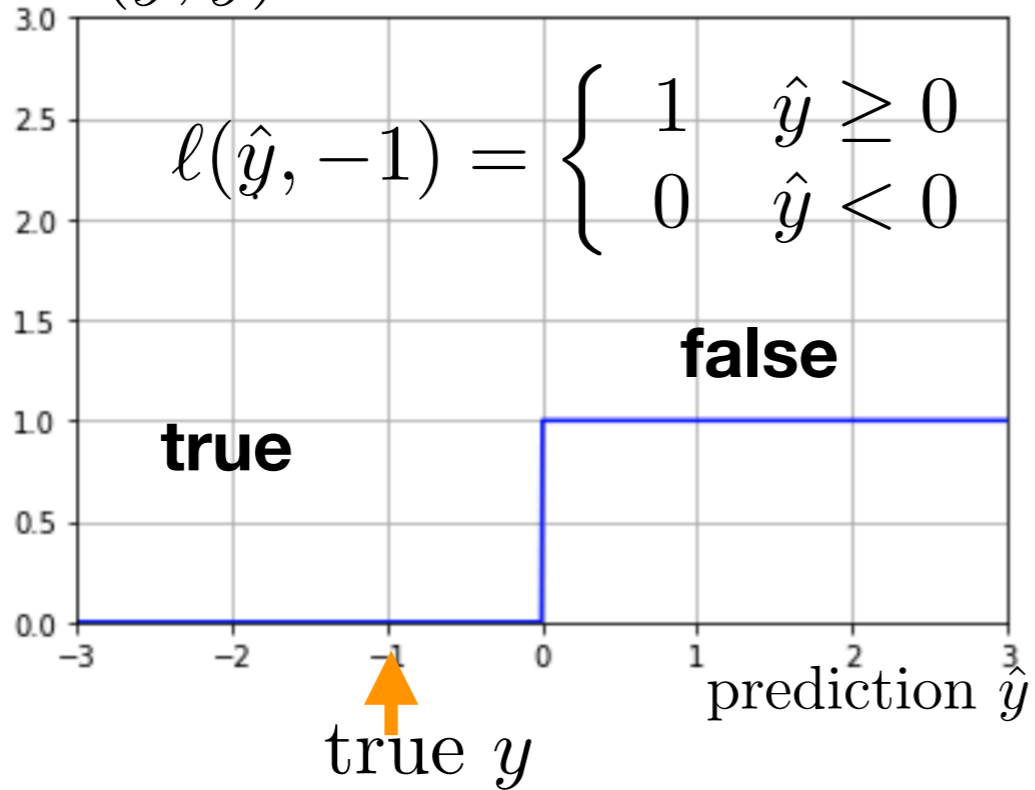
but only use selected features

5. Non-quadratic loss

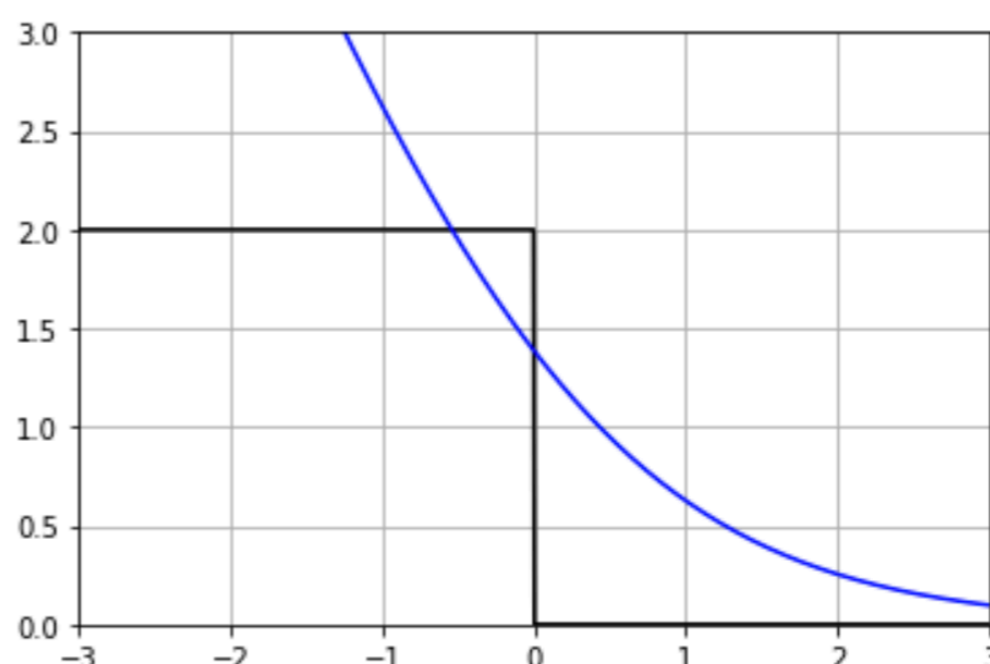
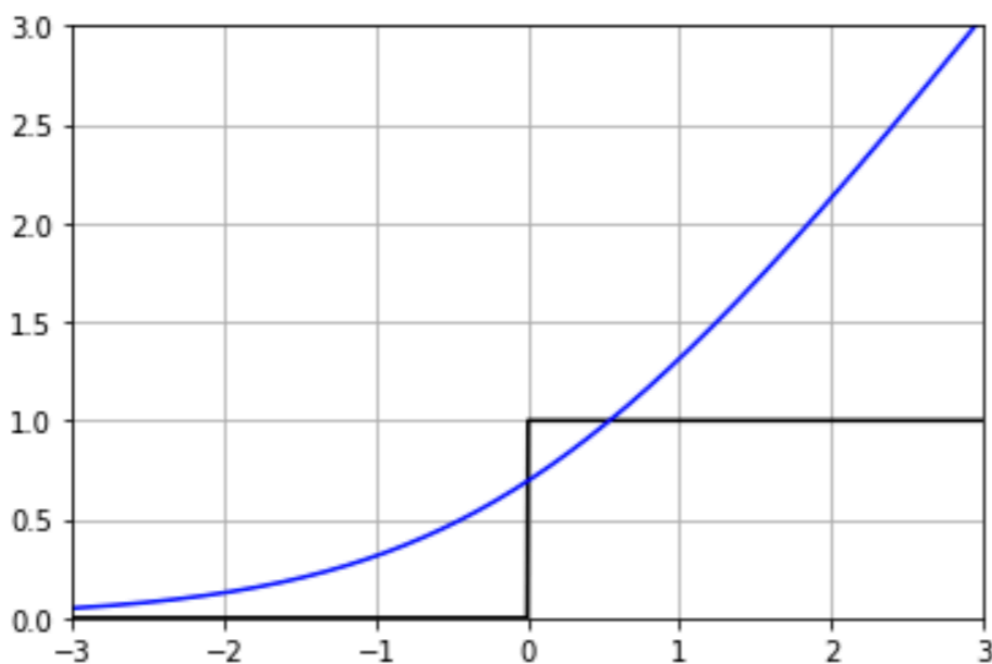
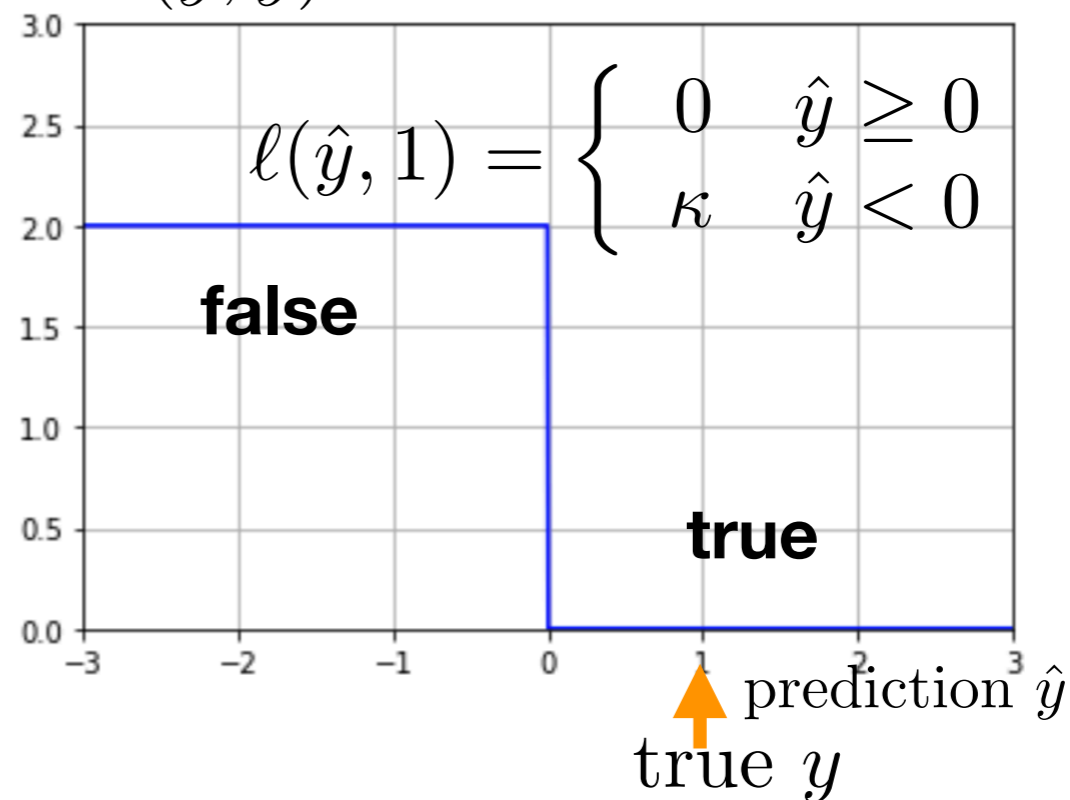


6.classifiers

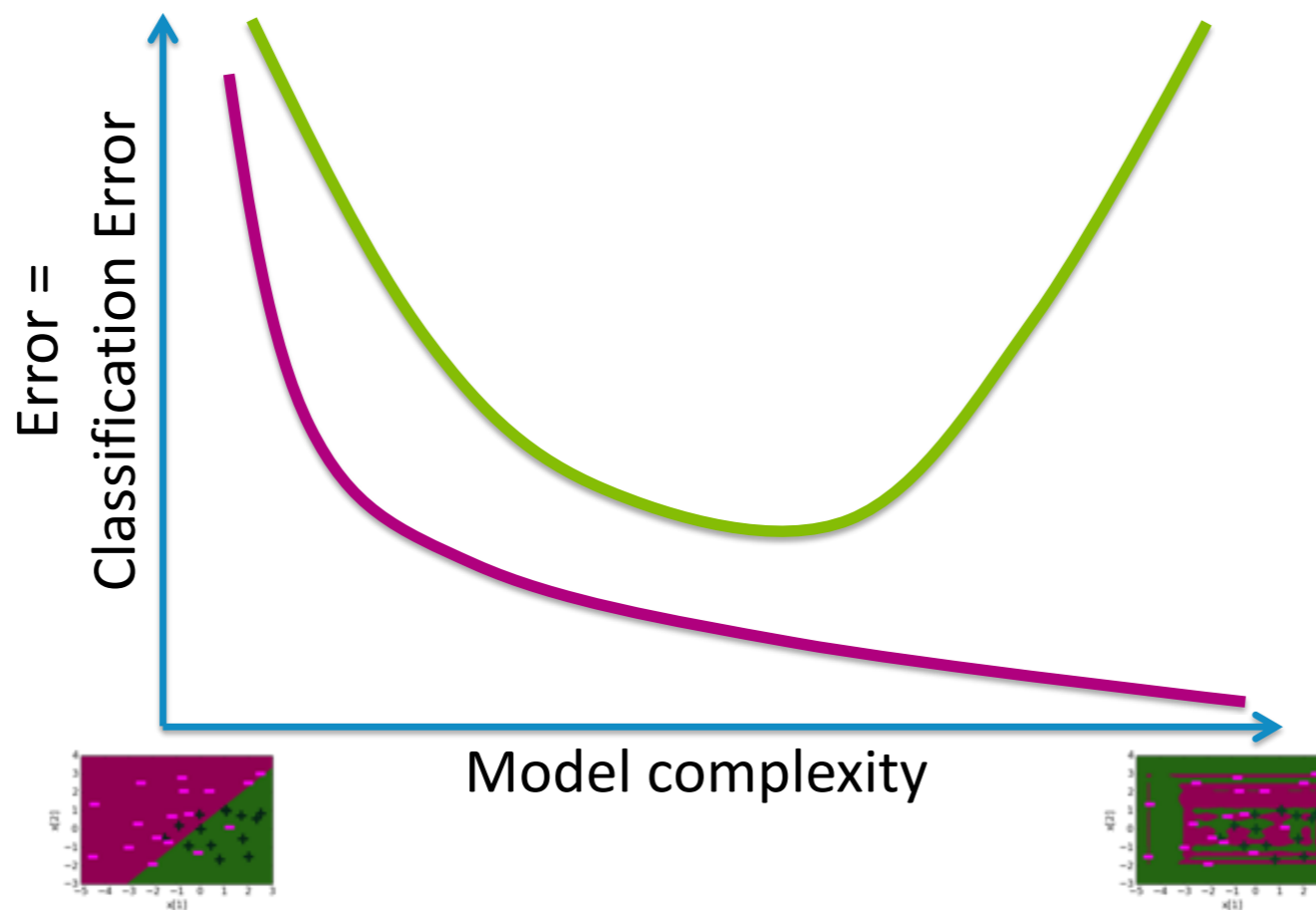
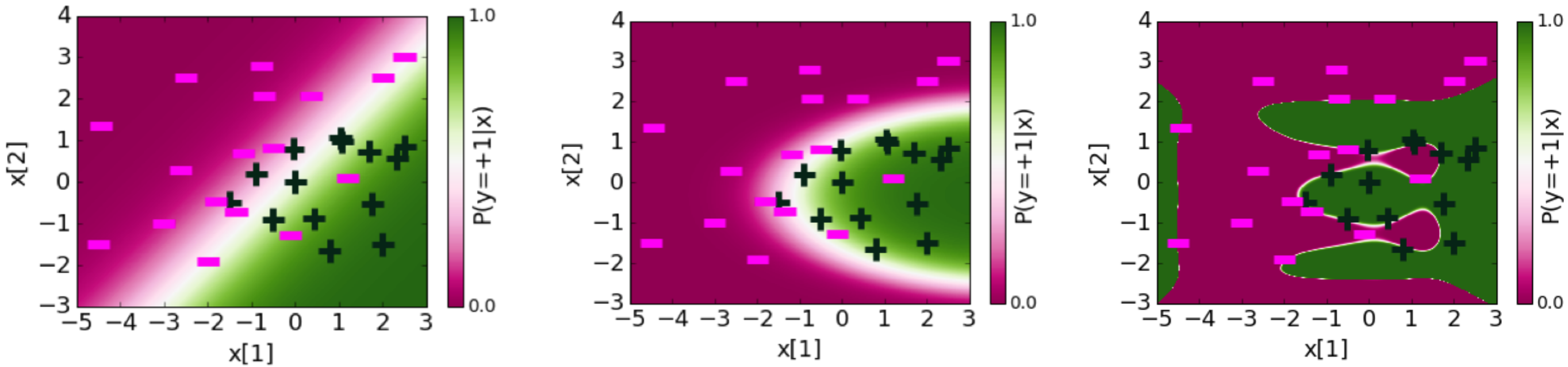
loss $\ell(\hat{y}, y)$



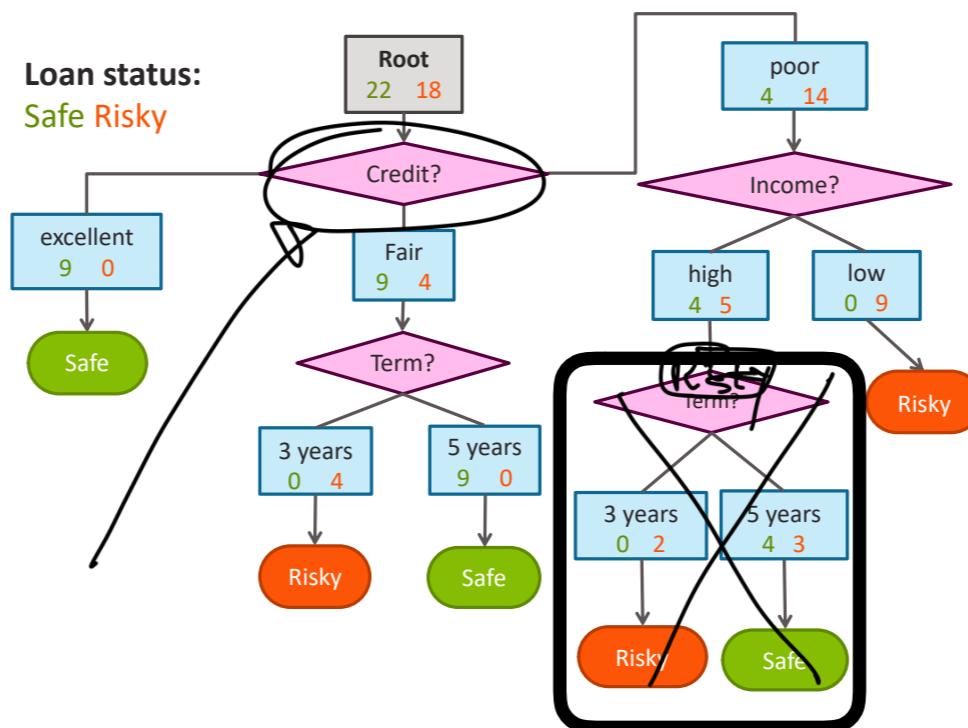
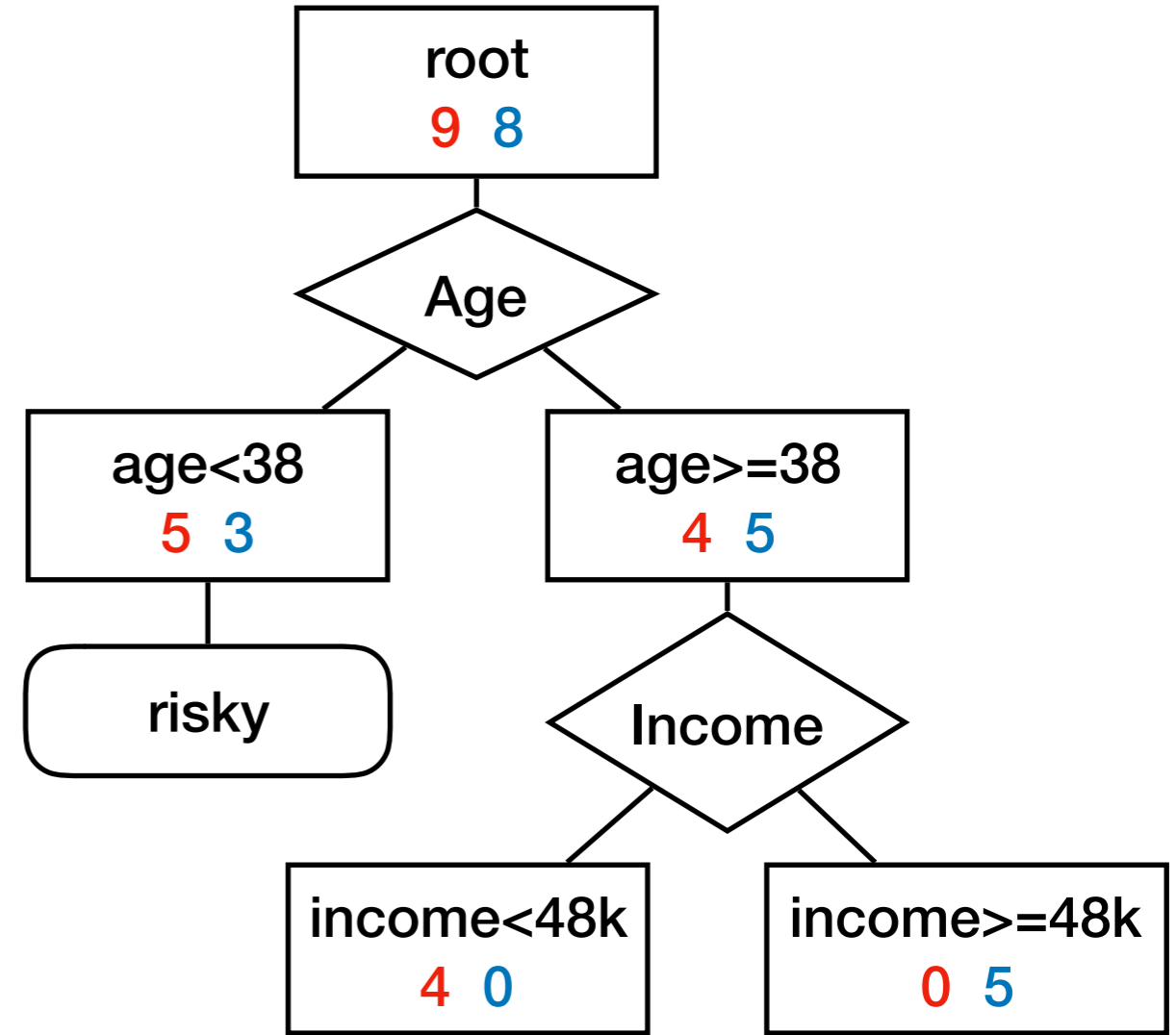
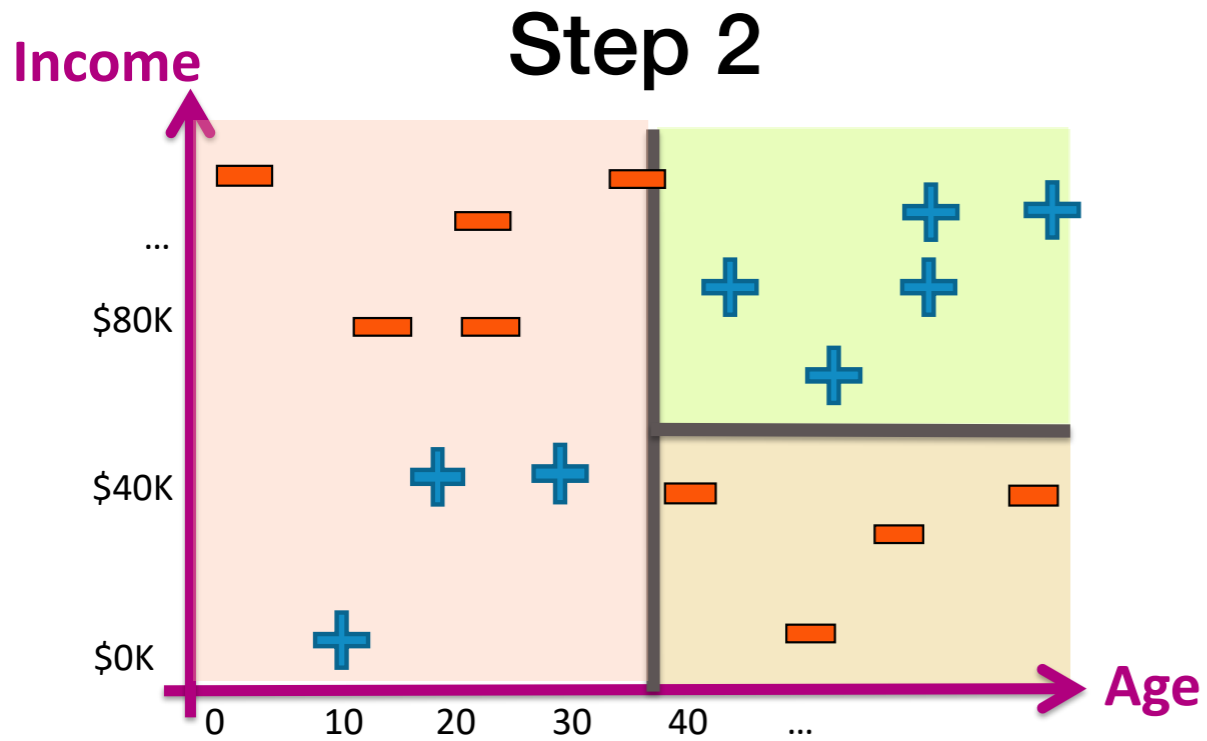
loss $\ell(\hat{y}, y)$



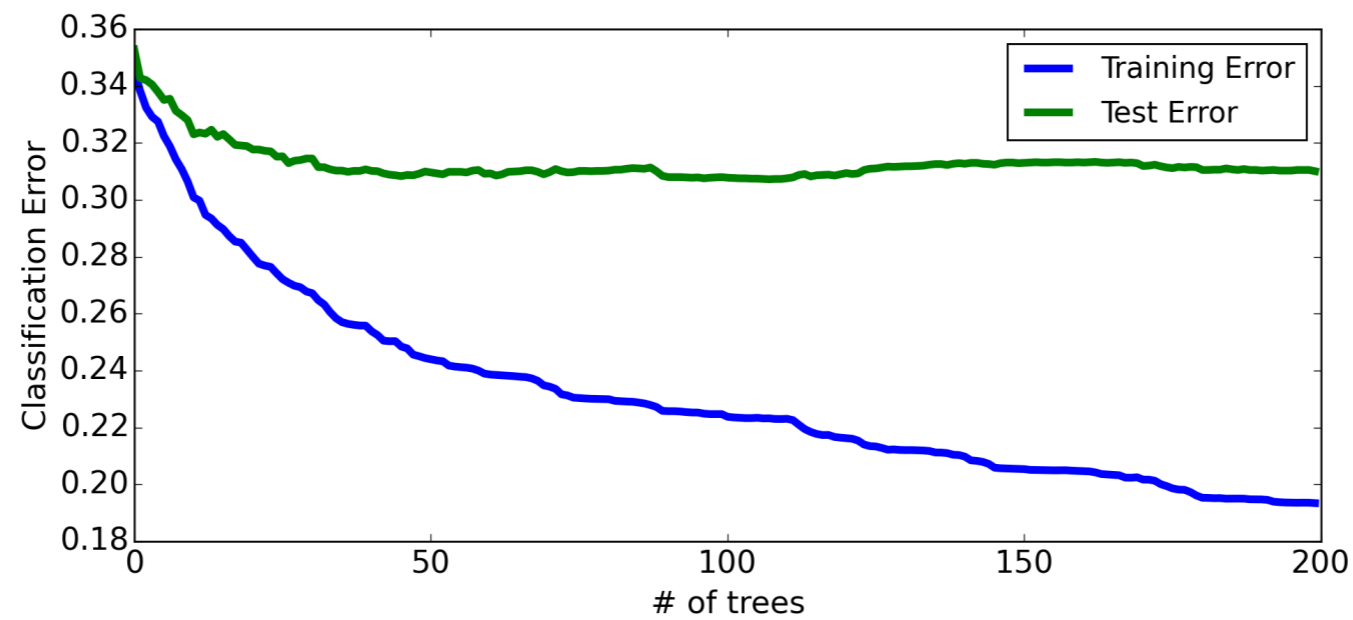
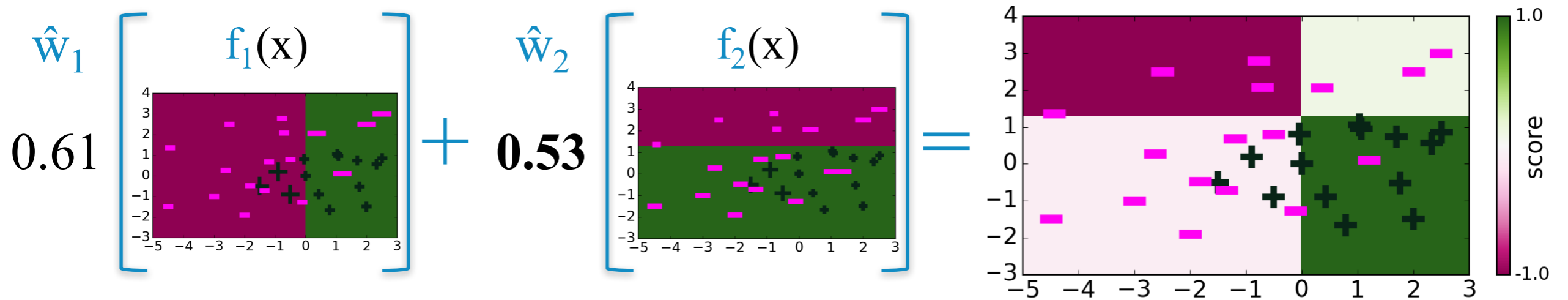
7. overconfident predictions



8. Decision trees

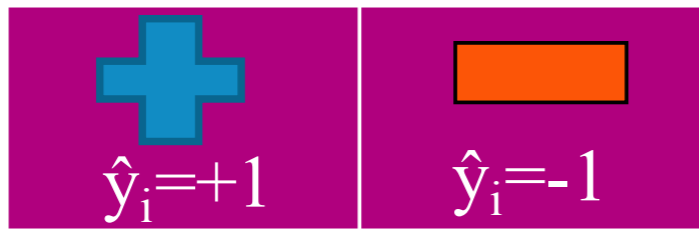


9.boosting





10.precision-recall

Predicted label

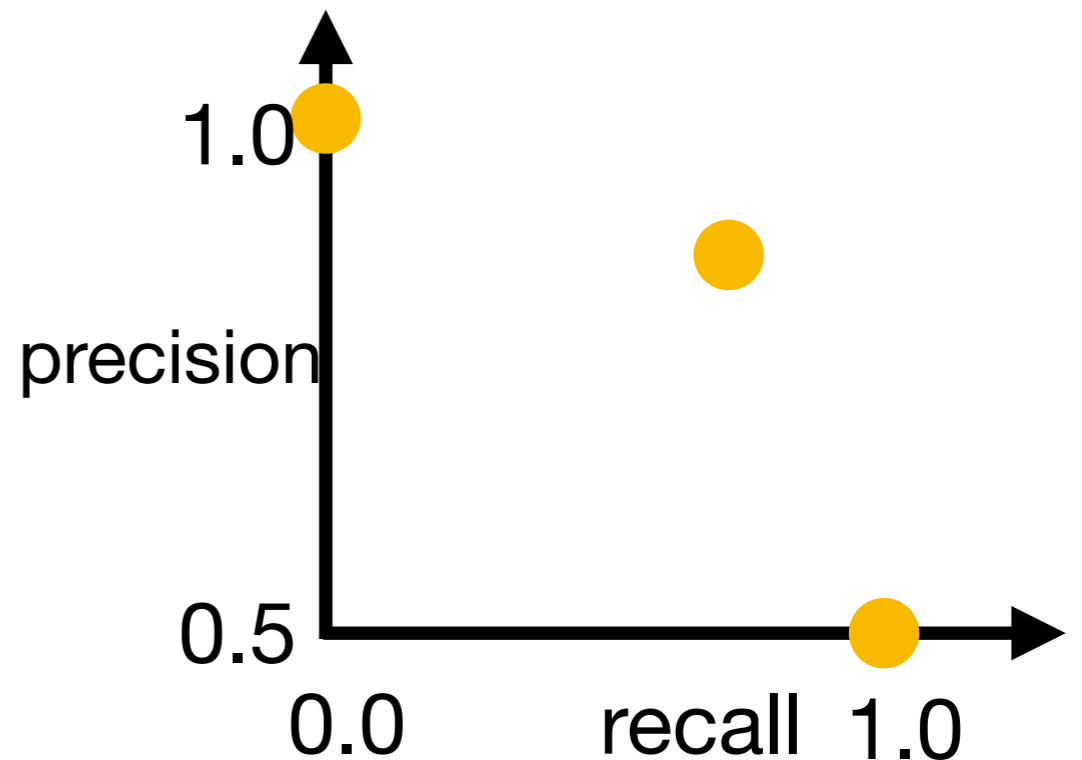
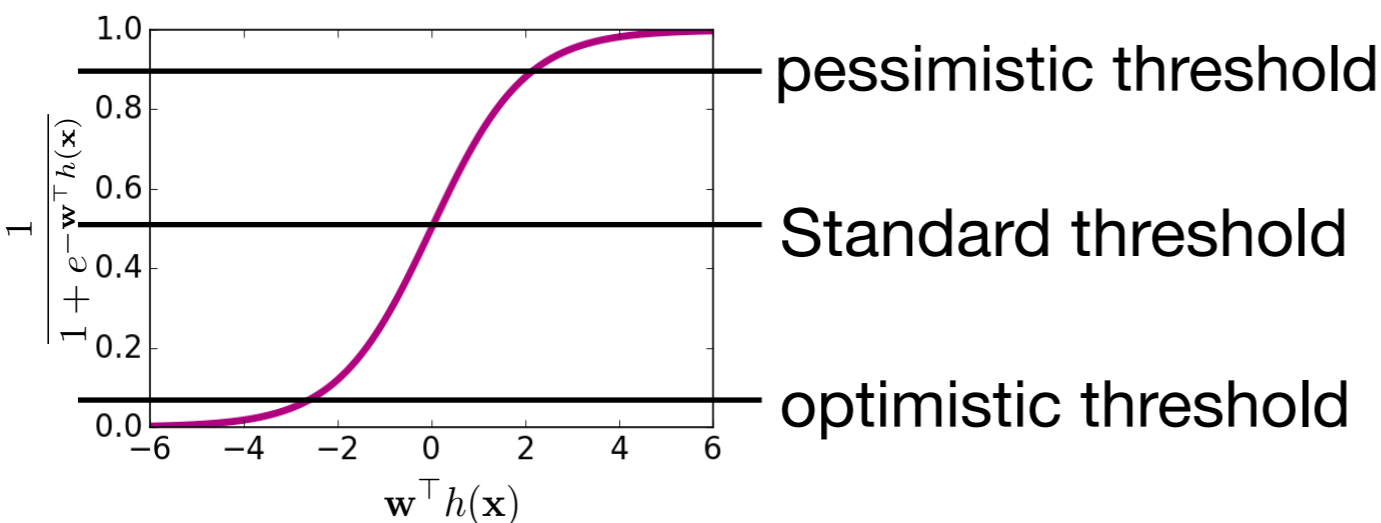


True label

 $y_i=+1$	True Positive C_{tp}	False Negative C_{fn}
 $y_i=-1$	False Positive C_{fp}	True Negative C_{tn}

$$\text{precision} = \frac{C_{tp}}{C_{tp} + C_{fp}}$$

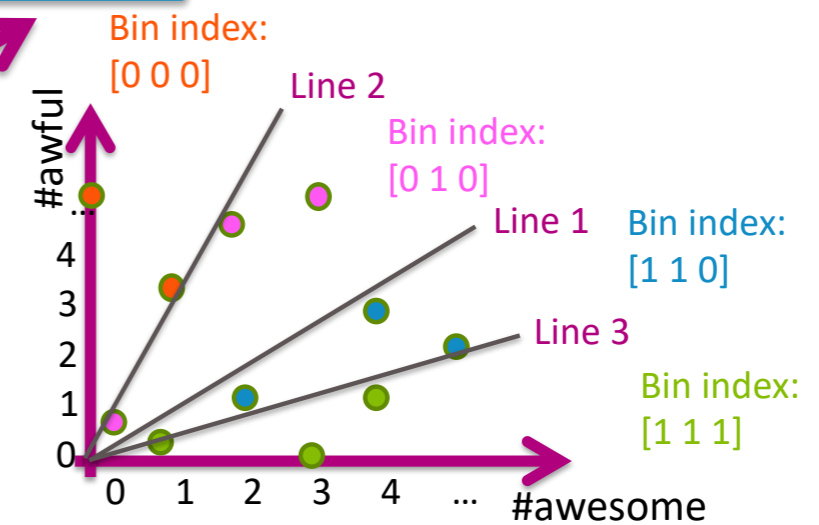
$$\text{recall} = \frac{C_{tp}}{C_{tp} + C_{fn}}$$



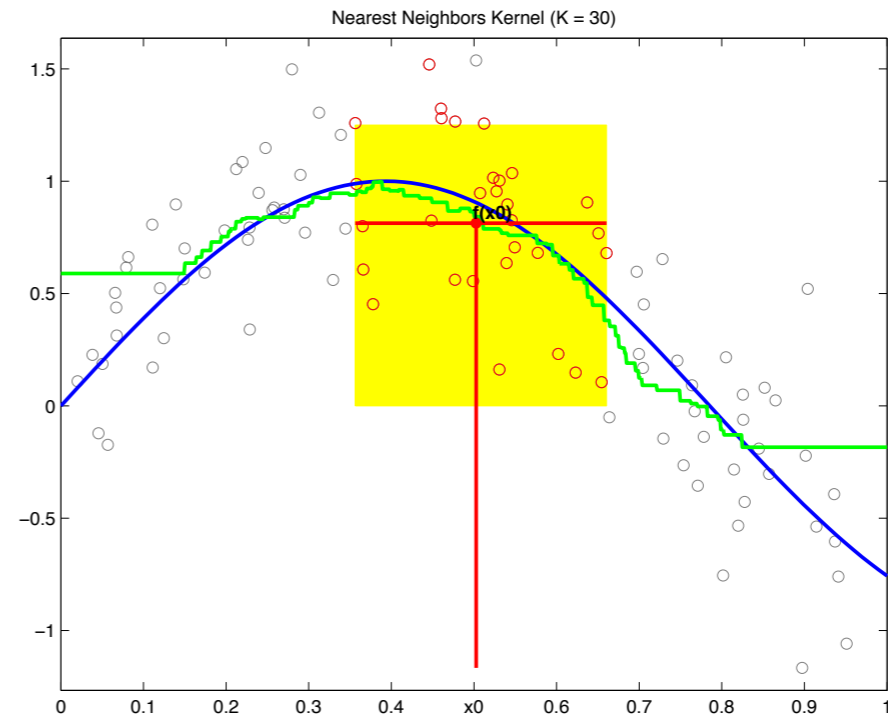
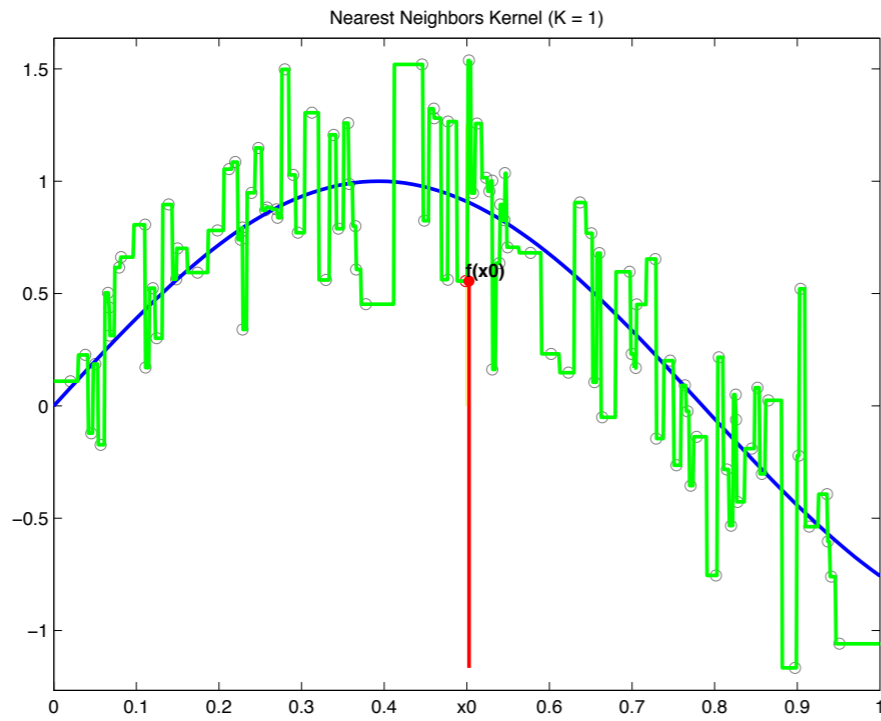
11. Nearest neighbor

Bin	[0 0 0] = 0	[0 0 1] = 1	[0 1 0] = 2	[0 1 1] = 3	[1 0 0] = 4	[1 0 1] = 5	[1 1 0] = 6	[1 1 1] = 7
Data indices:	{1,2}	--	{4,8,11}	--	--	--	{7,9,10}	{3,5,6}

Next closest bins
(flip 1 bit)



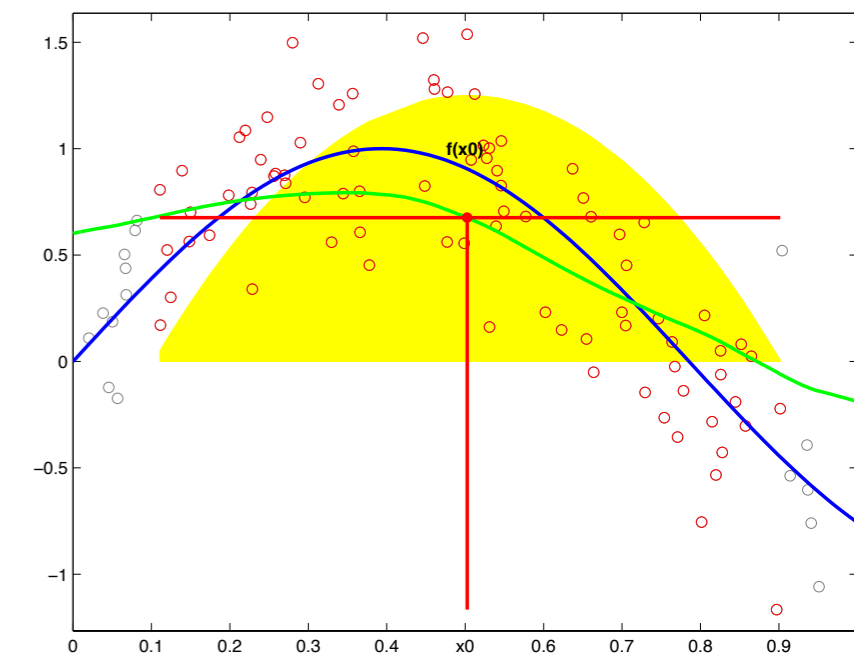
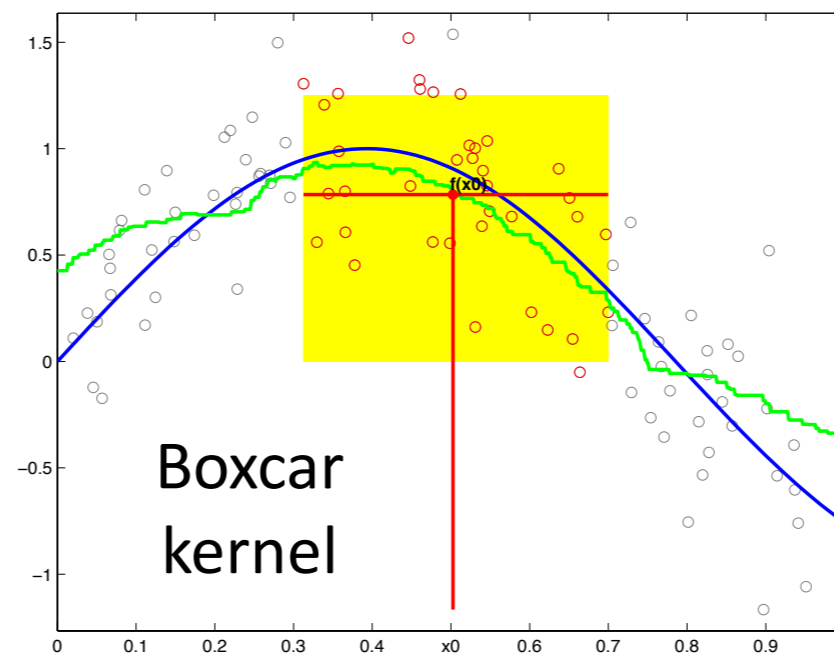
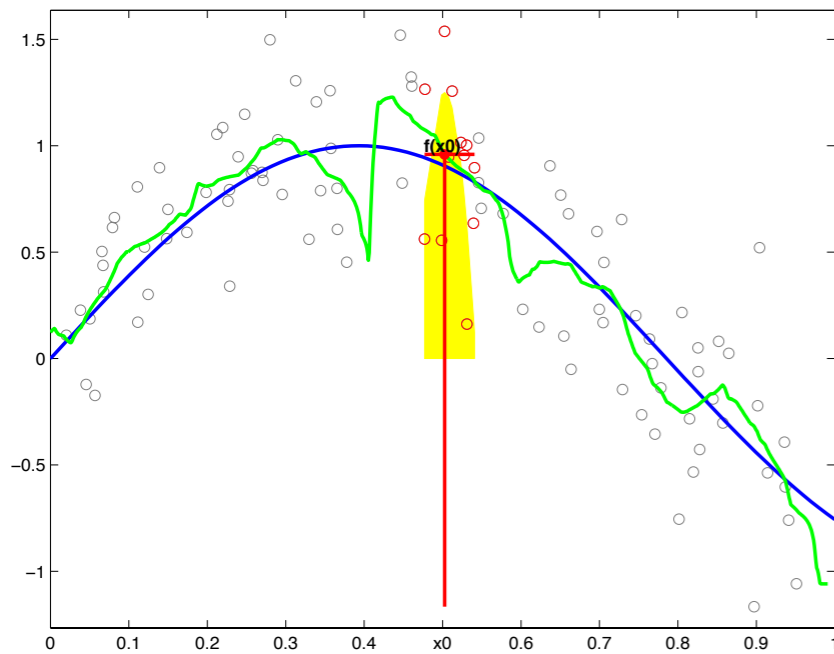
12. Nearest neighbor methods



$\lambda = 0.04$

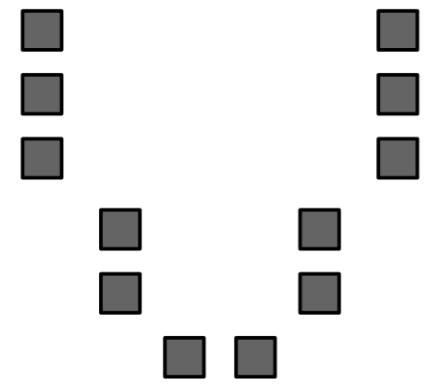
$\lambda = 0.2$

$\lambda = 0.4$

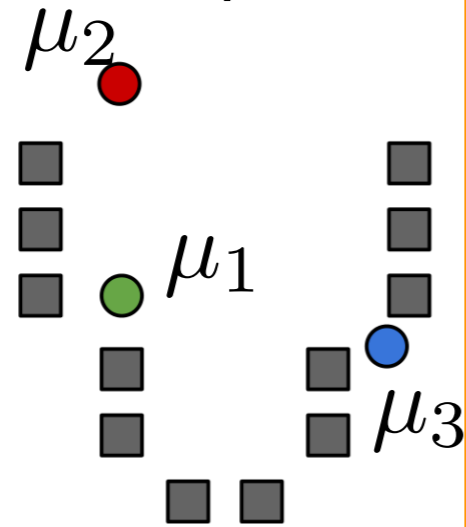


13.clustering

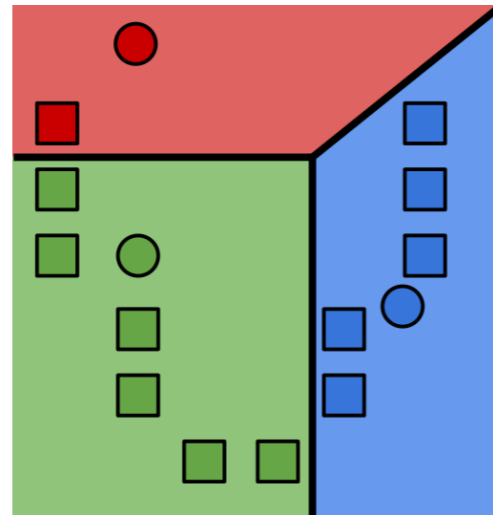
Input data



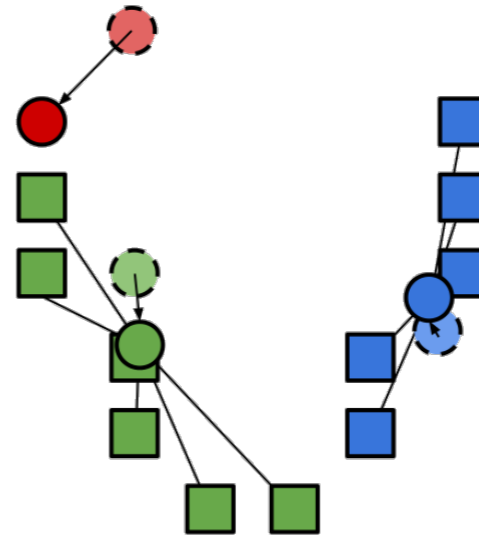
Step 0



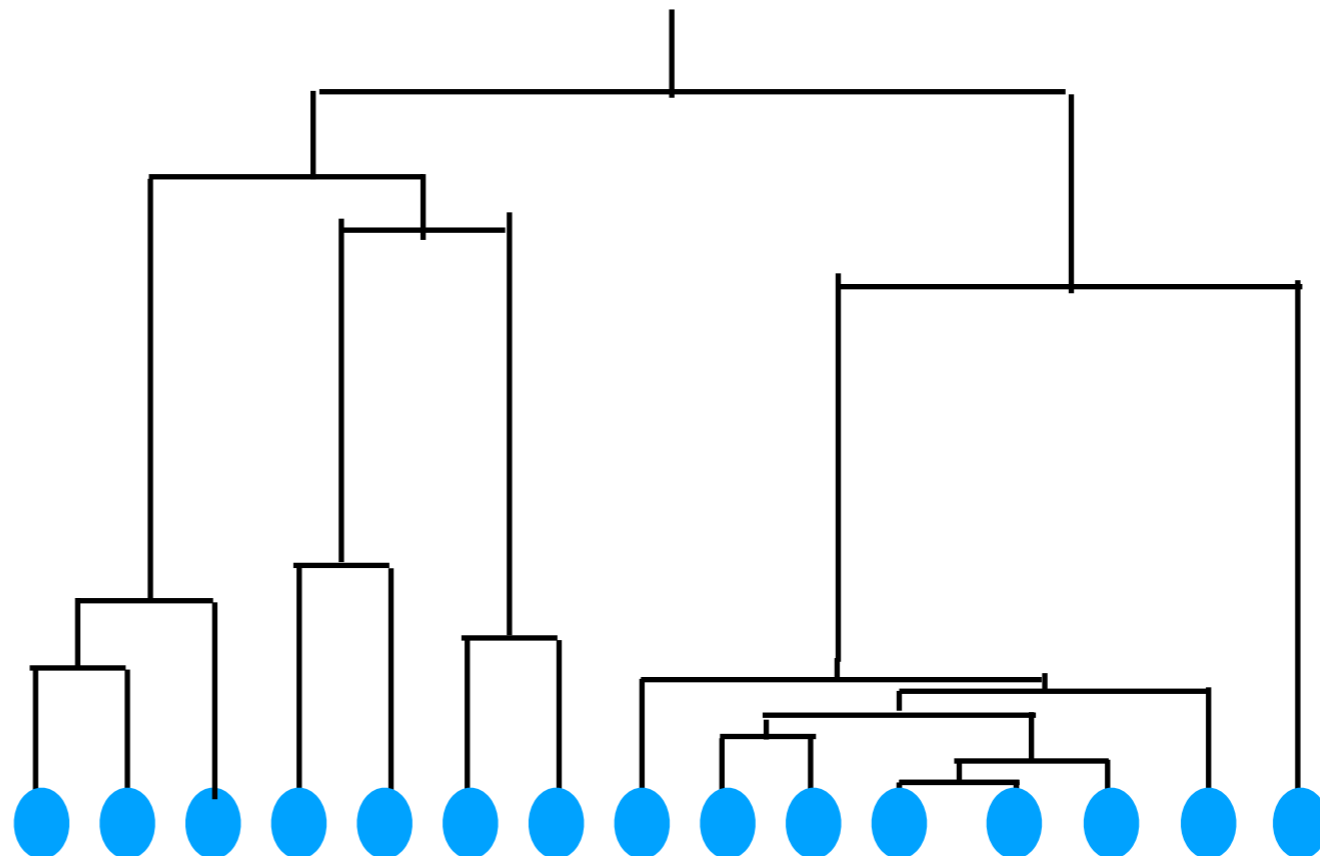
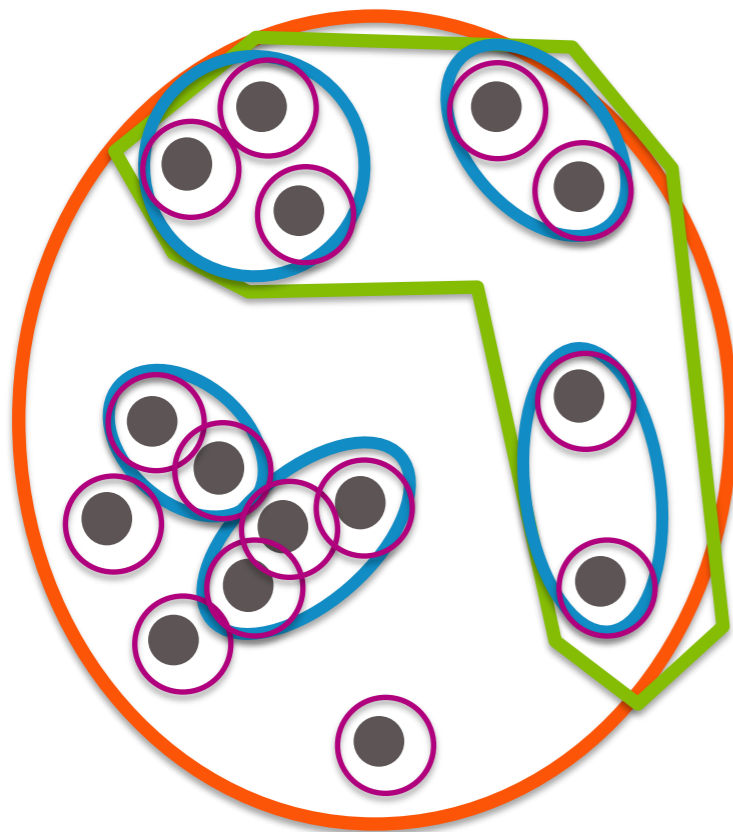
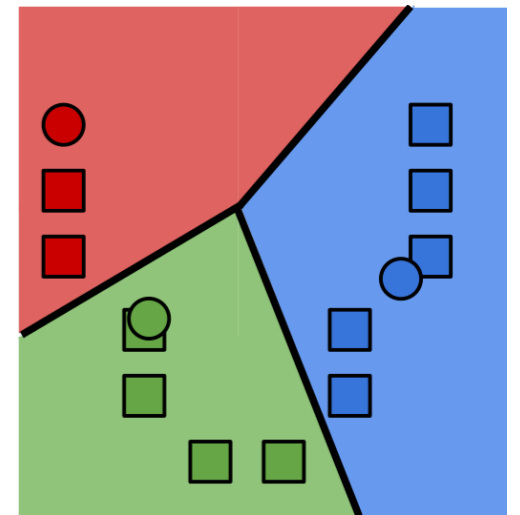
Step 1



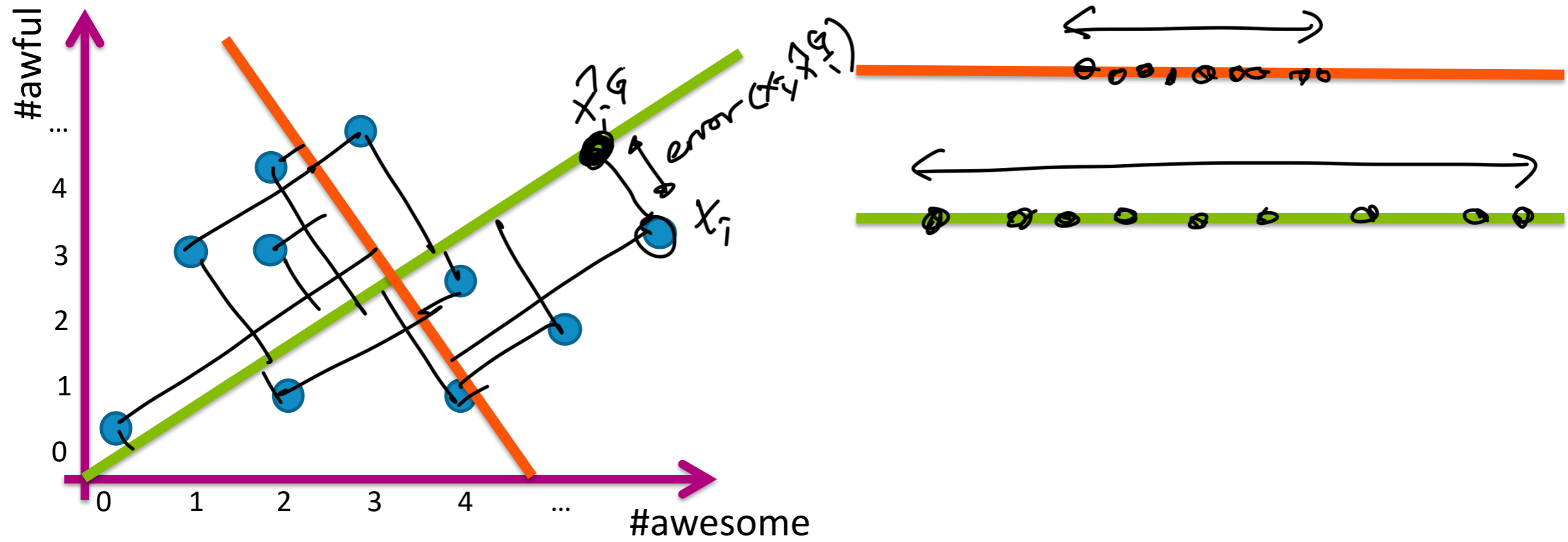
Step 2



Step 1



14. Dimensionality reduction



15.recommendation systems

