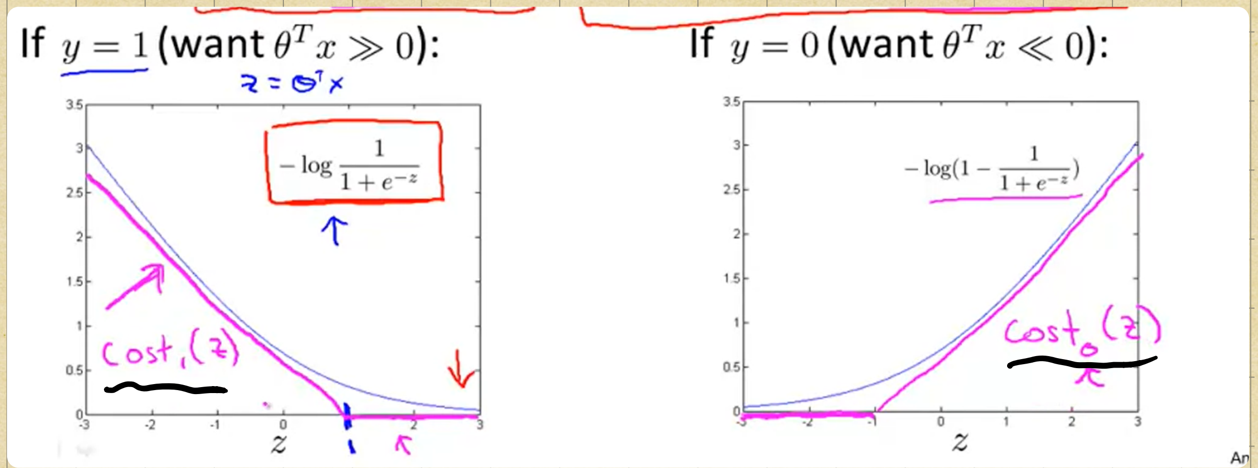
Logistic Regression

$$J = -y\log\frac{1}{1+e^{-\theta^T x}} - (1-y)\log\left(1-\frac{1}{1+e^{-\theta^T x}}\right).$$



SVM:

$$A + \lambda B$$

$$\min_\theta \frac{1}{m}\sum_{i=1}^{m} y^{(i)} cost_1(\theta^T x^{(i)}) + (1-y^{(i)}) cost_0(\theta^T x^{(i)}) + \frac{\lambda}{2m}\sum_{j=1}^{n}\theta_j^2$$

$$\Downarrow$$

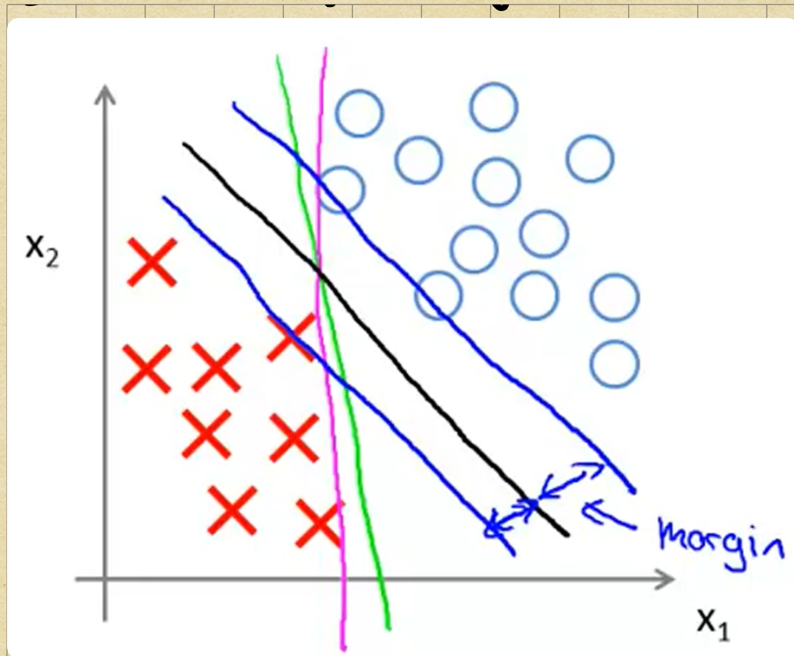
$$\min_\theta C\sum_{i=1}^{m}[y^{(i)} cost_1(\theta^T x^{(i)}) + (1-y^{(i)}) cost_0(\theta^T x^{(i)}) + \frac{1}{2}\sum_{j=1}^{n}\theta_j^2$$

$$C = \frac{1}{\lambda} \quad CA + B$$

if $y=1$ $\quad \theta^T x \geq 1$

if $y=0$ $\quad \theta^T x \leq -1$

SVM $\rightarrow$ Large margin classifier


x2
x1
margin