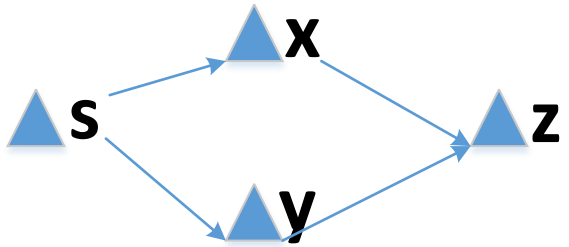
x → y → z

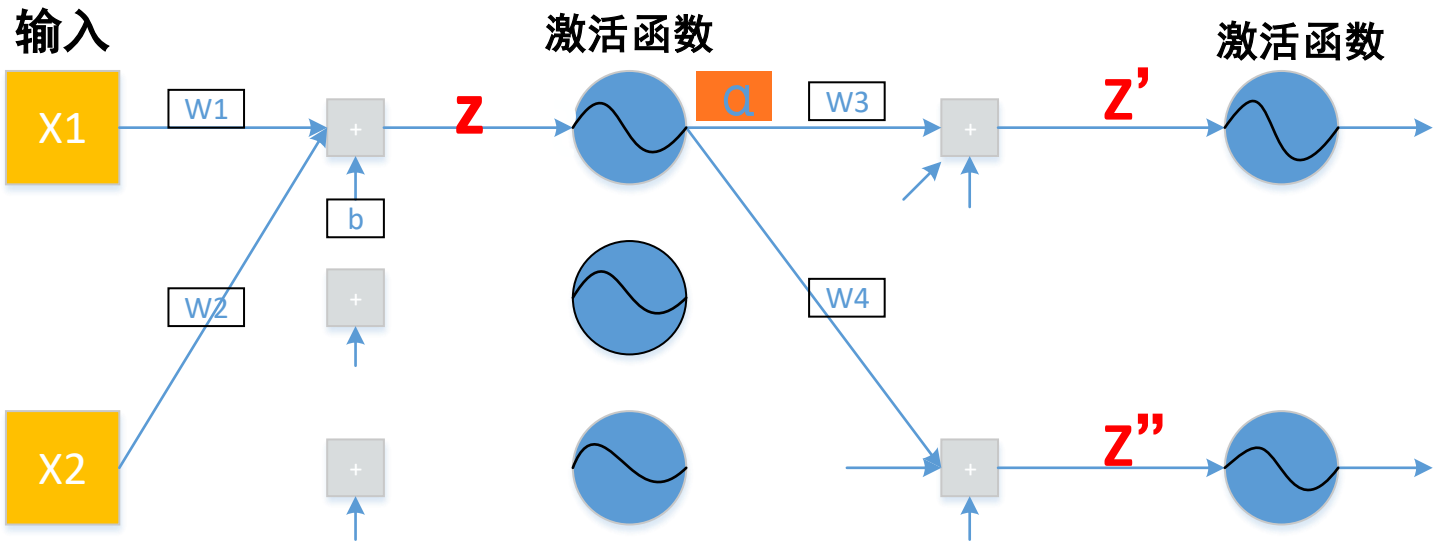
Y=g(x)　　z=h(y)

$$\frac{dz}{dx}=\frac{\partial z}{\partial y}\frac{dy}{dx}$$



X=g(s)　　y=h(s)　　z=k(x,y)

$$\frac{dz}{ds}=\frac{\partial z}{\partial x}\frac{dx}{ds}+\frac{\partial z}{\partial y}\frac{dy}{ds}$$



C=k(z' ,z")

z' =g(α)

z" =h(α)

Z=x1w1+x2w2　　α = σ（Z）

Z' = α w3+…+…= σ (Z)w3+…+…

Z" = α w4+…+…= σ (Z)w4+… +…

设损失函数为C

$$\frac{\partial C}{\partial w}=\frac{\partial z}{\partial w}\frac{\partial C}{\partial z}$$

$$\frac{\partial C}{\partial z}=\frac{\partial \alpha}{\partial z}\frac{\partial C}{\partial \alpha}=\sigma'(z)\frac{\partial C}{\partial \alpha}=\sigma'(z)\left(\frac{\partial z'}{\partial \alpha}\frac{\partial C}{\partial z'}+\frac{\partial z''}{\partial \alpha}\frac{\partial C}{\partial z''}\right)$$