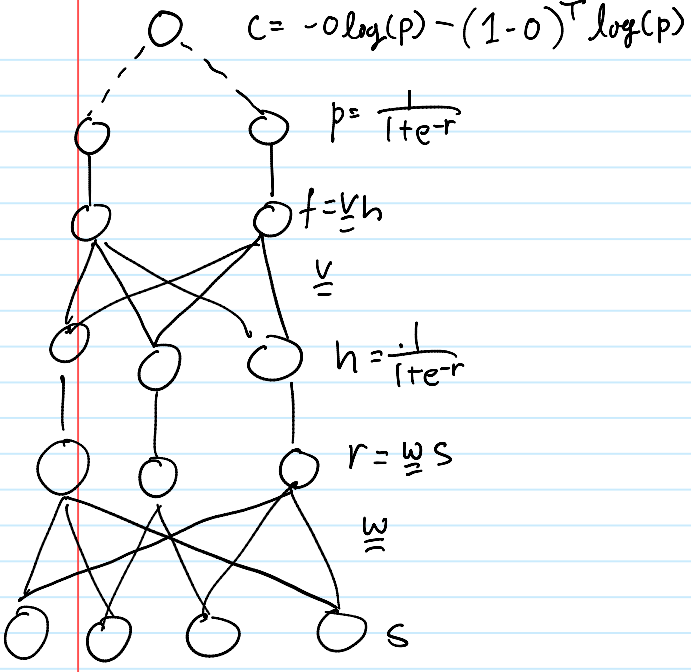
TA Notes 10/25

Friday, October 25, 2019 15:17



Chain Rules

$$\frac{dc}{dV_{vec}} = \frac{dc}{df}\frac{df}{dV_{vec}}$$

$$\frac{dc}{dw_{vec}} = \frac{dc}{df}\frac{df}{dh}\frac{dh}{dr}\frac{dr}{dw_{vec}}$$

$$\frac{dc}{df} = -(o-p)^T$$

$$l_n = \frac{1}{n}\sum_i c_i$$

$$\frac{dl_n}{dV_{vec}} = \frac{1}{n}\sum_i \frac{dc_i}{dV_{vec}}$$

$$\underset{2\ 6}{\left[\frac{df}{dw_{vec}}\right]} = \underset{1\ 3}{\left[h^T\right]} \otimes \underset{2\ 2}{\left[I\right]}$$

$$\frac{df}{dh} = V$$

$$\frac{dh}{dr} = \text{Diag}\left(h \odot (1-h)\right)$$

$$\underset{3\ 12}{\left[\frac{dr}{dw_{vec}}\right]} = \underset{1\ 4}{\left[s^T\right]} \otimes \underset{3\ 3}{\left[I\right]}$$

$$V(t+1) = V(t) - \gamma \, vec^{-1}\left(\frac{dE}{dV_{vec}}\right)$$
$$w(t+1) = w(t) - \gamma \, vec^{-1}\left(\frac{dC}{dw_{vec}}\right)$$

$$\vec{\theta}(t+1) = \vec{\theta}(t) - \gamma \frac{dC}{d\theta}$$

Alright, now onto coding!