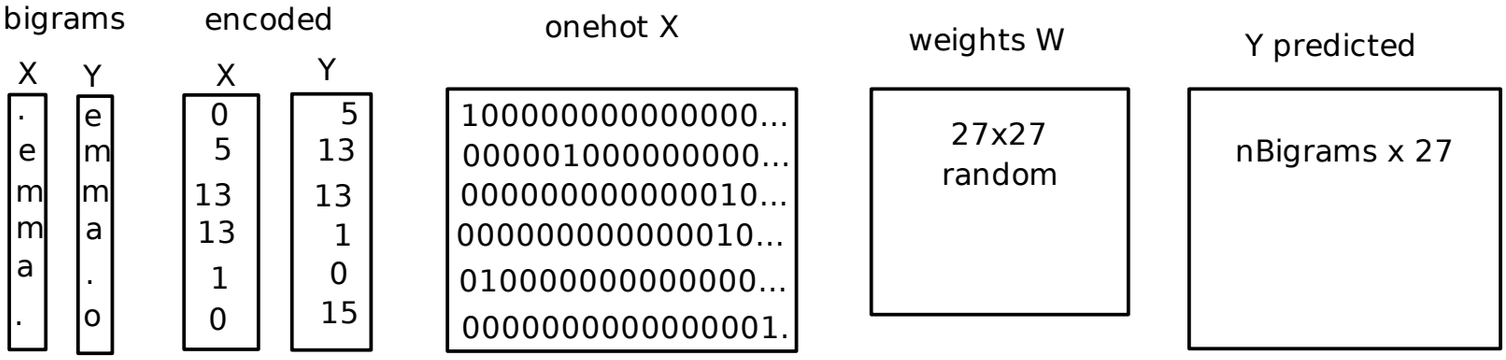

Forward Pass $Yp = W * X + b$

$Loss = 1/n \sum 1/2(Yp - Y)^2$

Backward Pass

$$L = \frac{1}{2}(Yp - Y)^2 \quad = \frac{1}{2}((Yp)^2 - 2YpY + Y^2) \quad = (Yp)^2/2 - YpY + Y^2/2$$

$$\frac{\partial L}{\partial Yp} = Yp - Y$$

$$\frac{\partial L}{\partial W} = \frac{\partial L}{\partial Yp} * \frac{\partial Yp}{\partial W} \qquad \text{and} \qquad \frac{\partial Yp}{\partial W} = X$$

so $$\frac{\partial L}{\partial W} = \frac{1}{n} \sum (Yp - Y) * X$$