

$$\begin{matrix} \theta \\ \text{1 x feature} \end{matrix} \rightarrow * \begin{matrix} X \\ \downarrow \downarrow \downarrow \end{matrix} = \begin{matrix} \text{sample} \\ [\bullet \bullet \bullet \bullet \bullet] \end{matrix}$$

```
h = 1. / (1 + exp(-theta' * X));
f = -y * log(h)' - (1-y) * (log(1-h)')
g = X * (h - y)'
```

f is a variable, $-y \log(h) - (1-y) \log(1-h)$

$$g = \begin{matrix} \downarrow \downarrow \downarrow \\ \bullet \\ \bullet \\ \bullet \end{matrix} = \begin{matrix} \log(h)' \\ \bullet \\ \bullet \\ \bullet \end{matrix} \quad \begin{matrix} \downarrow \downarrow \downarrow \\ \bullet \\ \bullet \\ \bullet \end{matrix} = \downarrow + \downarrow + \downarrow$$