$\log(y - w)$

$\log y \qquad y \in [0, 1]$

$\log(1 - y)$

$\cancel{\log 0} \qquad w \log y + (1-w) \log(1 - y)$

$\log(y + eps) \qquad \frac{1}{y}$

· mvnpdf (x, μ, Σ)

$$p(X|\mu,\Sigma) = \frac{1}{(2\pi)^D |\Sigma|^{1/2}} e^{-\frac{(X-\cancel{\mu})^T \Sigma^{-1} (X-\cancel{\mu})}{2}}$$

$\mu = 0$

$$\Sigma = \begin{bmatrix} \sigma_{11}^2 & & 0 \\ & \sigma_{22}^2 & \\ 0 & \ddots & \sigma_{DD}^2 \end{bmatrix}$$

$$= \frac{1}{\cancel{(2\pi)^D} (\sigma_{11}^2 \cdots \sigma_{DD}^2)^{1/2}} e^{-\sum_{d=1}^{D} \frac{x_d^2}{2\sigma_{dd}^2}}$$

max

$$\log p(X|\mu,\Sigma) \approx -\frac{1}{2} \underbrace{\log(\sigma_{11}^2 \cdots \sigma_{DD}^2)} - \sum_{d=1}^{D} \frac{x_d^2}{2\sigma_{dd}^2}$$

$$\boxed{= -\frac{1}{2} \sum_{d=1}^{D} \sigma_{dd}^2 - \frac{1}{2} \sum_{d=1}^{D} \frac{x_d^2}{2\sigma_{dd}^2}}$$

fminunc

- $\min -\log \Pr(X \mid \mu, \Sigma)$

$$\boxed{= \min \frac{1}{2} \sum_{d=1}^{D} \sigma_{dd}^{2} + \frac{1}{2} \sum_{d=1}^{D} \frac{x_d^2}{\sigma_{dd}^2}}$$