$$P(D|\theta)P(\theta)$$

$$= \theta^{\alpha_M}(1-\theta)^{\alpha_T}\theta^{\beta_M-1}(1-\theta)^{\beta_T-1}$$

$$\frac{\partial}{\partial\theta} = (\alpha_M+\beta_M-1)\lg\theta + (\alpha_T+\beta_T-1)\lg(1-\theta)$$

$$\frac{\alpha_M+\beta_M-1}{\theta} - \frac{\alpha_T+\beta_T-1}{1-\theta} = 0$$

$$q = \frac{\#M}{N}$$

$$q = \frac{\#M+1}{n+1} \quad , \quad q = \frac{\#M}{n+1}$$

$$P(D|\theta) = P(X|\theta) = \prod_i P(x_i|\theta)$$

$$\frac{Q}{M} = \prod \frac{1}{2\pi \sqrt{\sigma^2}} e^{\frac{-(x_i - M)}{2\sigma^2}}$$