

$$\pi(y) = \frac{\pi(y|\theta) \pi(\theta)}{\pi(\theta|y)}$$

$$= \frac{\binom{N}{y} \theta^y (1-\theta)^{N-y} \frac{1}{B(\alpha, \beta)} \theta^{\alpha-1} (1-\theta)^{\beta-1}}{\theta^{\alpha+y-1} (1-\theta)^{\beta+N-y-1}}$$

$$= \binom{N}{y} \frac{B(\alpha+y, \beta+N-y)}{B(\alpha, \beta)}$$