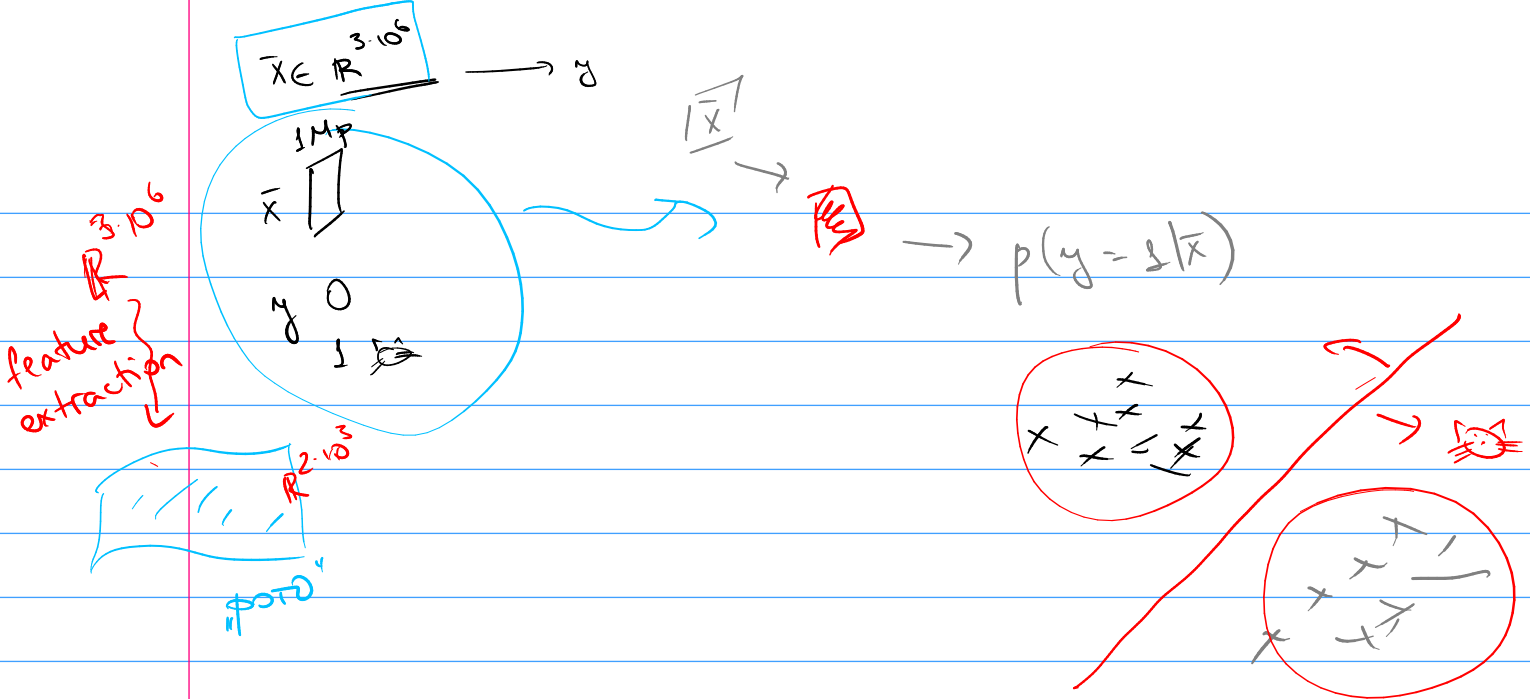


$$p(x|y) = \frac{p(x,y)}{p(y)} \qquad p(x,y) = p(x|y)p(y) = p(y|x)p(x)$$

$$p(x|y) = \frac{p(y|x)\,p(x)}{p(y)}$$ Bayes theorem

параметры модели

likelihood × prior

$$p(\theta|D) = \frac{p(D|\theta)\,p(\theta)}{p(D)}$$ evidence

posterior — данные

posterior ∝ likelihood × prior

$\theta = p(\text{"решка"})$

$D = \text{ррор}$

$p(D|\theta) = \theta^3(1-\theta)$

$\theta \to \max$

$\theta^m(1-\theta)^n \to \max$

$m\theta^{m-1}(1-\theta)^n - n\theta^m(1-\theta)^{n-1} = \theta^{m-1}(1-\theta)^{n-1}\big(m(1-\theta) - n\theta\big) = 0$

$\theta = 0, 1, \frac{m}{m+n}$

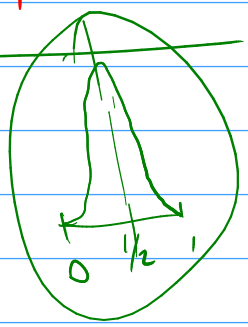
$p(D|\theta) \to \max, \ \theta_{ML}$

$p(\theta)$

$p(\theta|D) \to \max, \ \theta_{MAP}$

$D = p$

$\theta_{ML} = \frac{1}{2}$



predictive distribution

$$p(x|D) = \int p(x,\theta|D)\,d\theta = \int p(\theta|D)\,p(x|\theta,D)\,d\theta$$

сид. эксперимент

posterior

$p(x|\theta)$ — likelihood