

AMS 206
12 Feb 19

FINAL due date
for quiz 3: 11.59 pm Fri 15 Feb 19

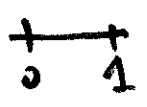
FINAL due date for take home
test 2: 11.59 pm on Tue 19 Feb 19

this time: Bayes
next time:

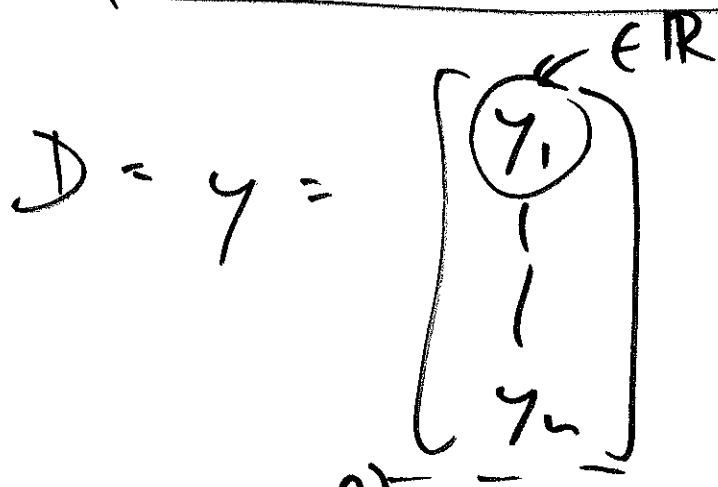
$$(y_1, \dots, y_n)$$

$$p(\theta | y, \mathcal{B}) = c \cdot p(\theta | \mathcal{B}) \cdot \underbrace{p(y | \theta, \mathcal{B})}$$

$$= c \cdot p(\theta) \cdot \ell(\theta | y, \mathcal{B})$$

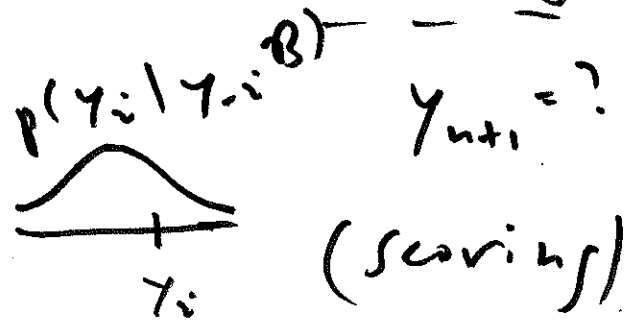


$$p(\theta | y, \mathcal{B}) = c \cdot p(\theta | \mathcal{B}) \cdot \ell(\theta | y, \mathcal{B})$$



$$p(y_{n+1} | y, \mathcal{B})$$

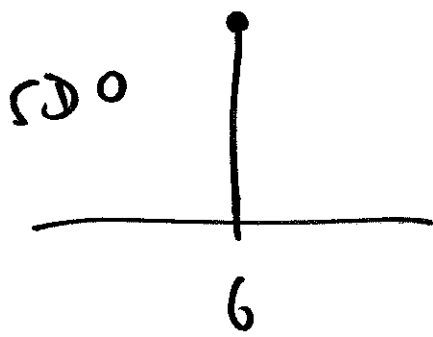
set y_i aside: y_{-i}



$$p(y_i | y_{-i}, \mathcal{B})$$

LOO CV

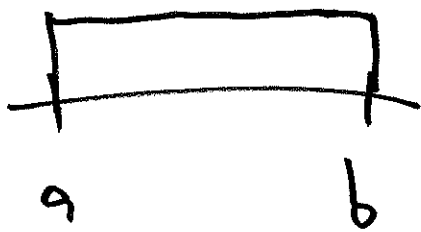
leave me
out class
validation



I'm certain
that $\theta = 6$

(2)

s) $\text{I} \rightarrow \text{Laplace}$



I know nothing
about θ except
that it's between
 a & b ($a < b$)

$$p(\theta | \gamma, \mathcal{B}) = c \overset{\text{Beta}(d, \beta)}{p(\theta | \mathcal{B})} \cdot \mathcal{L}(\theta | \gamma, \mathcal{B})$$

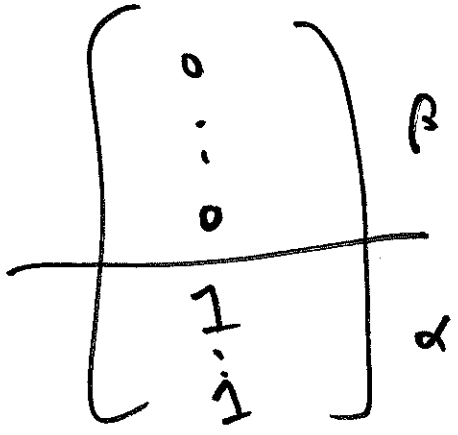
$$c \theta^{(d+s)-1} (1-\theta)^{(\beta+n-s)-1} = c \theta^{d-1} (1-\theta)^{\beta-1} \cdot \left[\theta^s (1-\theta)^{n-s} \right]$$

$$\text{Beta}(d+s, \beta+n-s) = \text{Beta}(d, \beta) \cdot \text{Beta}(s+1, n-s+1)$$

① prior, lik, post: same math form

② product of 2 such firs is another such fir

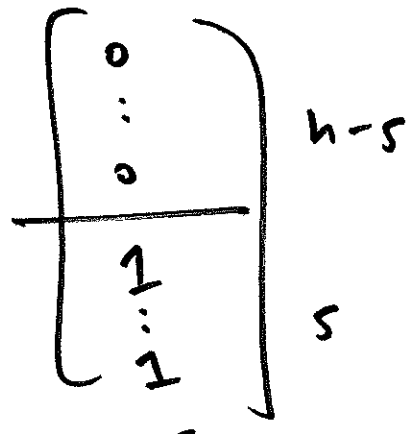
Beta family is conjugate to Bernoulli lik.



4.5 25.5
 ↓ ↓
 (α+β)
 prior
 sample
 size = 30

prior
 data
 set

mean $\frac{\alpha}{\alpha+\beta} = 0.15$



403
 ———
 433
 403
 = data
 sample
 size

~~data~~
 sample
 data

mean $\frac{5}{h} = 0.18$

conjugate
 priors