minimizing loss functions

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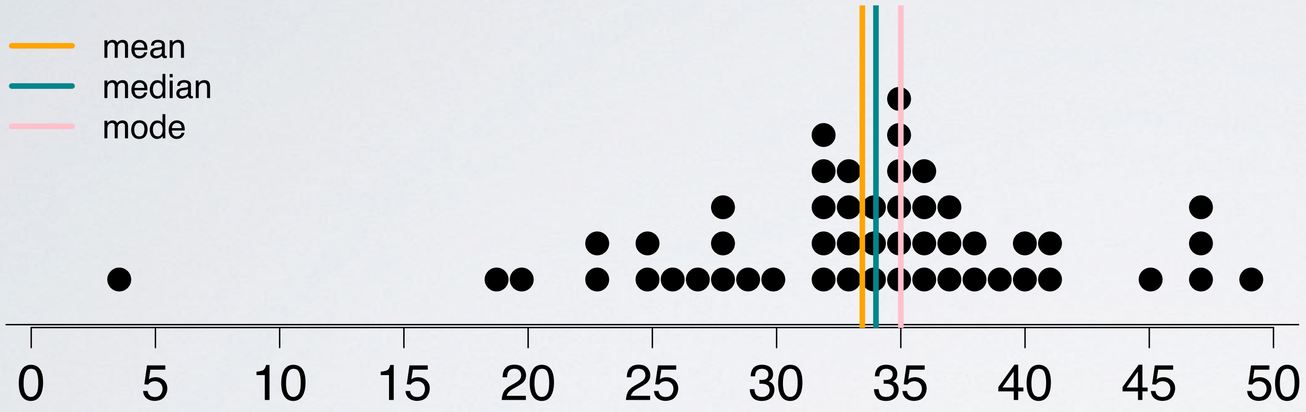
posterior

$$g = 30$$



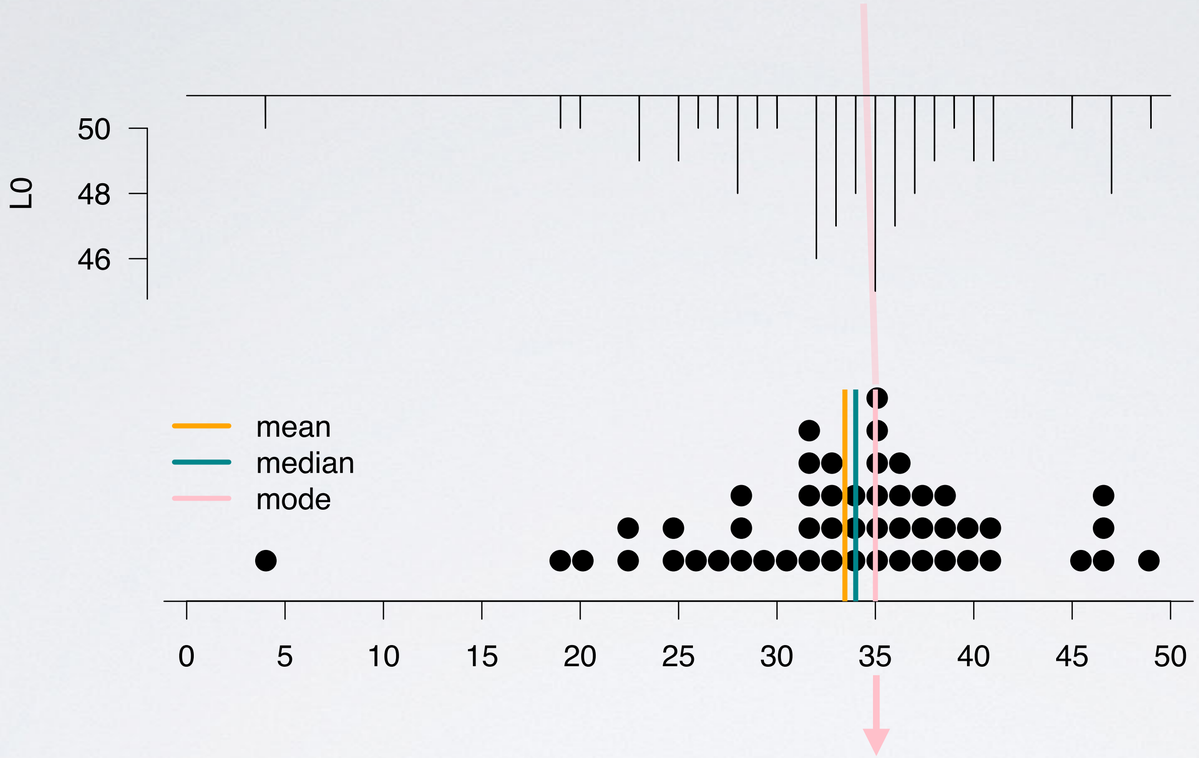
L_0: 0/1 loss

$$L_{0,i}(g) = \begin{cases} 0 & \text{if } g = x_i \\ 1 & \text{otherwise} \end{cases}$$

$$L_0 = \sum_i L_{0,i}(g)$$

L_0: 0/1 loss for $g = 30$

i	x_i	L_0: 0 / 1
1	4	1
2	19	1
3	20	1
	…	…
14	30	0
	…	…
50	47	1
51	49	1
	Total	50



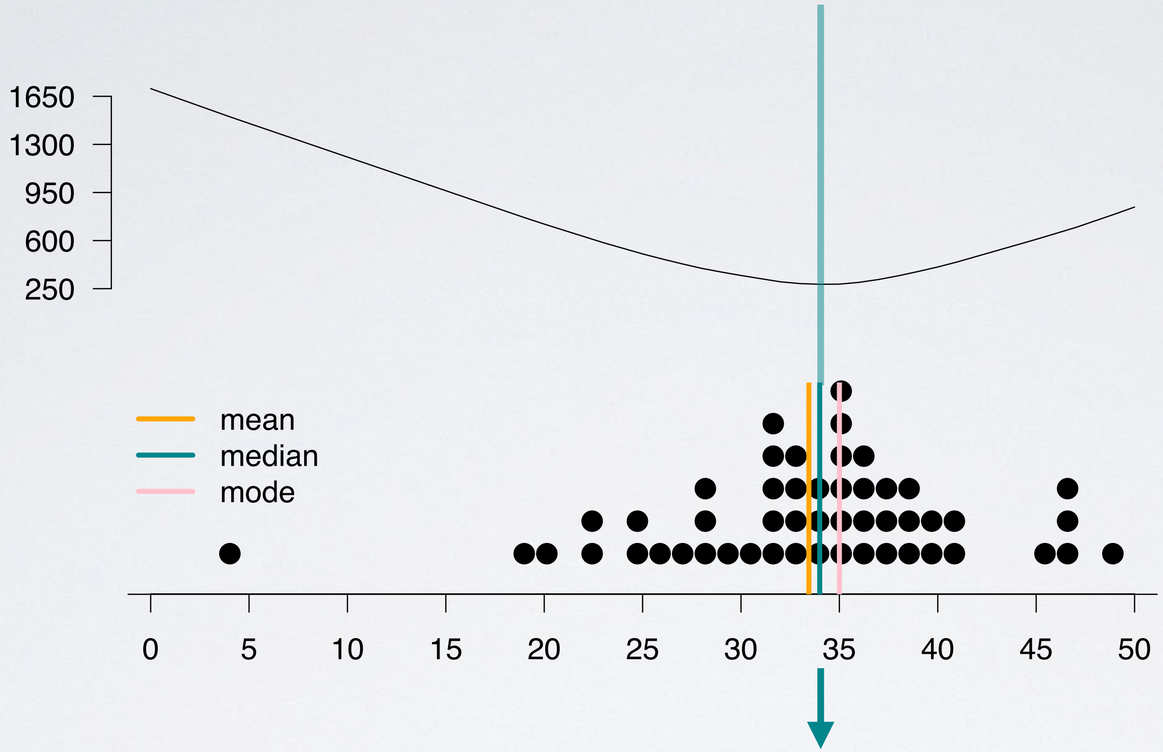
L_0 is minimized at the **mode** of the posterior

L_1: linear loss

$$L_1(g) = \sum_i |x_i - g|$$

L_1: linear loss for $g = 30$

i	x_i	L_1: $\lvert x_i - 30 \rvert$
1	4	26
2	19	11
3	20	10
	…	…
14	30	0
	…	…
50	47	17
51	49	19
	Total	346



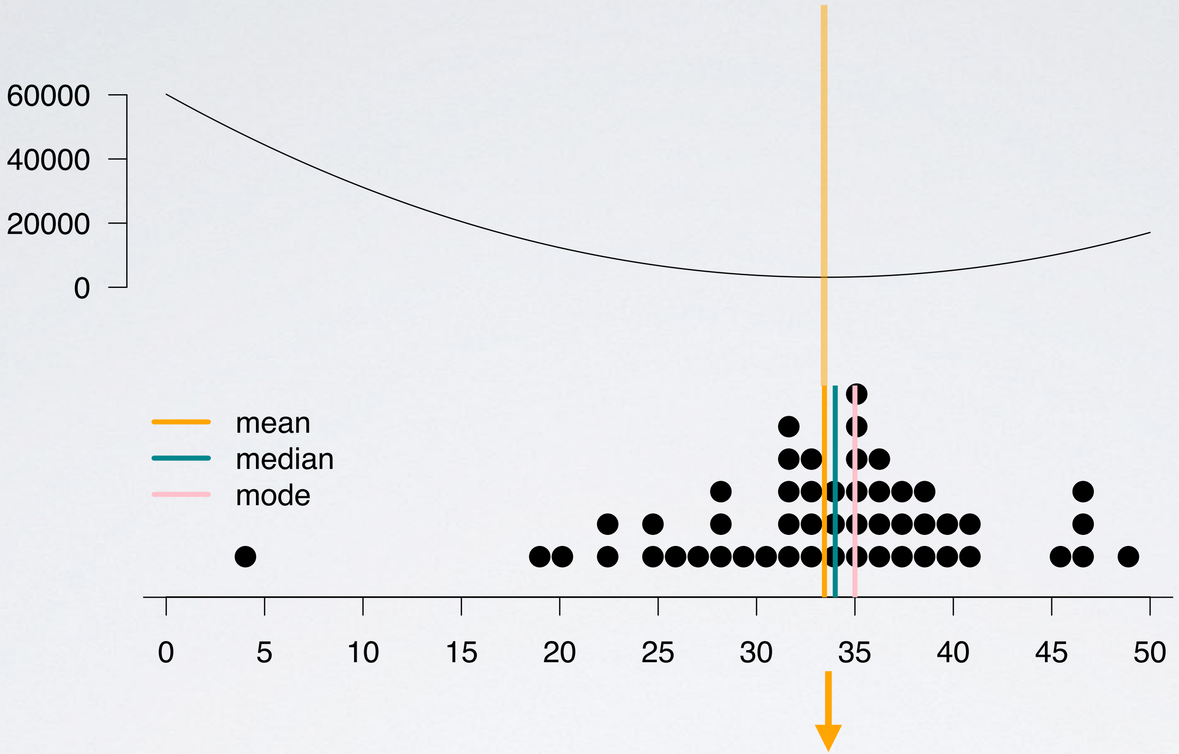
L_1 is minimized at the **median** of the posterior

L_2: squared loss

$$L_2(g) = \sum_i (x_i - g)^2$$

L_2: squared loss for $g = 30$

i	x_i	L_2: $(x_i - 30)^2$
1	4	676
2	19	121
3	20	100
	…	…
14	30	0
	…	…
50	47	289
51	49	361
	Total	3732



L_2 is minimized at the **mean** of the posterior

summary

- L0 minimized at mode
- L1 minimized at median
- L2 minimized at mean
- point estimate you report depends on your choice of loss function