MLaRPIS Homework Exercise 1

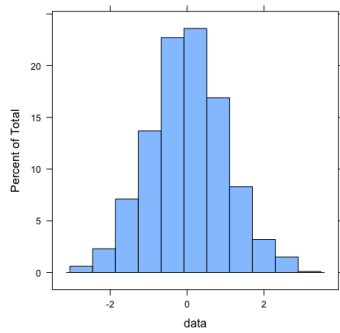Pepijn Vink

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1 Bayes Rule

Bayes Rule is a formula that is used to update the prior using the likelihood to obtain the posterior distribution.
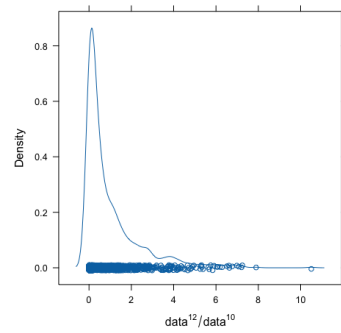
1.1 Equation

This is the equation for Bayes rule.

$$P(\theta|D) = \frac{P(D|\theta)P(\theta)}{P(D)} = \frac{P(D|\theta)P(\theta)}{\int P(D|\theta)P(\theta)d\theta} \tag{1}$$
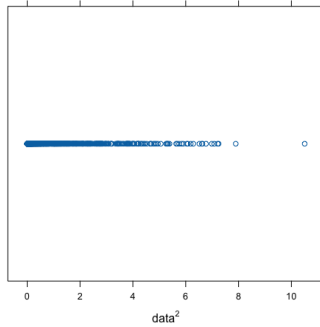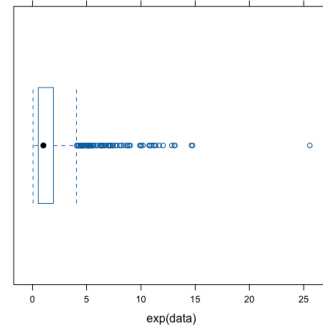
1.2 Visualizations

(a) Histogram

(b) Densityplot

(c) Stripplot

(d) Boxplot

Figure 1: Different plots of the same data, sometimes transformed. No particular objective other than it being an exercise.

Table 1: The same data, but now in a table. Only the first nine rows are displayed.

	data	squared1	squared2	exponent
1	-0.56	0.31	0.31	0.57
2	-0.23	0.05	0.05	0.79
3	1.56	2.43	2.43	4.75
4	0.07	0.00	0.00	1.07
5	0.13	0.02	0.02	1.14
6	1.72	2.94	2.94	5.56
7	0.46	0.21	0.21	1.59
8	-1.27	1.60	1.60	0.28
9	-0.69	0.47	0.47	0.50