Model Selection and Resampling - Exercises

Joris LIMONIER

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1 In-class exercises January 26, 2022

$x \sim \mathcal{N}(0, I_n)$

$$y = Lx + a \implies y = Lx + a \sim \mathcal{N}(a, L^T L)$$

$$\begin{aligned}
\mathbb{E}[y] &= \mathbb{E}[Lx + a] \\
&= L \underbrace{\mathbb{E}[x]}_{=0} + a \\
&= a
\end{aligned}$$

$$\begin{aligned}
\operatorname{Cov}[y] &= \operatorname{Cov}[Lx + a] \\
&= L^T \underbrace{\operatorname{Cov}[x]}_{=I_n} L \\
&= L^T L
\end{aligned}$$