Minimum Description Length Model Selection

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Notation

Numbers

$\lfloor x \rfloor$	The value of x, rounded down to the nearest integer
$\lceil x \rceil$	The value of x, rounded up to the nearest integer
$\log x$	The binary logarithm of x
$\ln x$	The natural logarithm of x
$\mathbf{1}_A(x)$	The indicator function, which equals 1 if $x \in A$ and 0 otherwise

Sets

$\mathbb{B}$	Binary numbers 0 and 1	(Note: in Chapter 6, the blackboard symbols are used for something else)
$\mathbb{N}$	Natural numbers $0, 1, 2, \ldots$	
$\mathbb{Z}$	Integers $\ldots, -2, -1, 0, 1, 2, \ldots$	
$\mathbb{Z}^+$	Positive integers $1, 2, \ldots$	
$\lvert\mathcal{X}\rvert$	The size of a finite set $\mathcal{X}$	
$[n]$	Abbreviation for $\{1, 2, \ldots, n\}$, with $[0] = \emptyset$ and $[\infty] = \mathbb{Z}^+$	

Sequences. Let $n \in \mathbb{N}$ and let $\mathcal{X}$ be a countable set.

$\mathcal{X}^n$	The set of all length n sequences of elements from $\mathcal{X}$
$\mathcal{X}^*$	The set of all finite sequences of elements from $\mathcal{X}$: $\mathcal{X}^* := \cup_{n \in \mathbb{N}} \mathcal{X}^n$
$\mathcal{X}^\infty$	The set of all infinite sequences of elements from $\mathcal{X}$
x^n	EITHER exponentiation, OR the sequence $x_1, x_2, \ldots, x_n$ for $n \in \mathbb{N}$
x^0 / ϵ	The empty sequence

Asymptotics. Let $a, c, x_0, x \in \mathbb{R}$.

$f \to a$	$\lim_{x \to \infty} f(x) = a$
$f = O(g)$	$\exists x_0, c > 0 : \forall x \geq x_0 : \lvert f(x)\rvert \leq c\lvert g(x)\rvert$
$f = \Omega(g)$	$\exists x_0, c > 0 : \forall x \geq x_0 : \lvert f(x)\rvert \geq c\lvert g(x)\rvert$ (*Not* the complement of o!)
$f = \Theta(g)$	$f = O(g)$ and $f = \Omega(g)$
$f \asymp g$	The same as $f = \Theta(g)$
$f = o(g)$	$f(x)/g(x) \to 0$