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Notation Index

$\mathbb{1}_A$	indicator function of the set A
2^Ω	set of all subsets of Ω
$\#A$	cardinality of the set A
A^c	complement $\Omega \setminus A$ of the set $A \subset \Omega$
$A \cap B$	intersection of the sets A and B
$A \cup B$	union of the sets A and B
$A \uplus B$	disjoint union of A and B
$A \subset B$	A is a (not necessarily strict) subset of B
$A \setminus B$	difference set
$A \triangle B$	symmetric difference of A and B , 30
$A \times B$	Cartesian product of A and B
\mathcal{A}	subset of 2^Ω , usually a σ -algebra
$\mathcal{A} _B$	trace of the class \mathcal{A} on B , 11
$\mathcal{A} \otimes \mathcal{A}'$	product of the σ -algebras \mathcal{A} and \mathcal{A}' , 272
$\mathcal{B}(E)$	Borel σ -algebra on E , 9
Ber_p	Bernoulli distribution, 45
$\beta_{r,s}$	Beta distribution with parameters r and s , 48
$b_{n,p}$	binomial distribution, 45, 302
$b_{r,p}^-$	negative binomial distribution, 46, 302
$C(E), C_b(E), C_c(E)$	space of continuous (bounded) functions, and with compact support, respectively, 248
\mathcal{C}_{qv}	functions with continuous square variation, 485

\mathbb{C}	set of complex numbers
Cau_a	Cauchy distribution, 302
$\text{Cov}[X, Y]$	covariance of the random variables X and Y , 102
CPoi_ν	compound Poisson distribution, 329
δ_x	Dirac distribution, 12
$\mathbf{E}[X]$	expectation (or mean) of the random variable X , 101
$\mathbf{E}[X; A]$	$=\mathbf{E}[X \mathbb{1}_A]$, 171
$\mathbf{E}[X \mathcal{F}]$	conditional expectation, 173
\exp_θ	exponential distribution, 47, 302
$\mathbb{F} = (\mathcal{F}_t)_{t \in I}$	filtration, 191
a.s., a.e.	almost surely and almost everywhere, 32
$G(x, y)$	Green function of a Markov chain, 363
$\Gamma_{\theta, r}$	Gamma distribution with scale parameter $\theta > 0$ and shape parameter $r > 0$, 47, 302
$\gamma_p = b_{1, p}^-$	geometric distribution with parameter p , 45
$\text{gcd}(M)$	greatest common divisor of all $m \in M \subset \mathbb{N}$, 380
$H \cdot X$	discrete stochastic integral of H with respect to X , 198
\mathcal{I}	set of invariant distributions of a Markov chain, 373
iff	if and only if
i.i.d.	independent and identically distributed, 56
$\text{Im}(z)$	imaginary part of $z \in \mathbb{C}$, 293
λ, λ^n	Lebesgue measure, n -dimensional, 26
$\text{Lip}(E)$	space of Lipschitz continuous functions on E , 249
\mathcal{L}^p, L^p	Lebesgue spaces of integrable functions, 91, 143, 144
$\mathcal{L}(X)$	distribution of the random variable X
$\mathcal{M}(E), \mathcal{M}_f(E),$ $\mathcal{M}_{\leq 1}, \mathcal{M}_1(E)$	set of measures on E , finite measures on E , (sub-) probability measures on E , respectively, 18, 247
$\mathcal{M}_{loc, c}$	space of continuous local martingales, 488
$\mu \otimes \nu$	product of the measures μ and ν , 28, 275
$\mu * \nu$	convolution of the measures μ and ν , 62, 277
$\mu^{\otimes n}$	n th power of a measure μ , 275

μ^{*n}	n th convolution power of a measure μ , 62
$\mu \ll \nu$	μ is absolutely continuous with respect to ν , 156
$\mu \perp \nu$	μ and ν are mutually singular, 156
$\mu \approx \nu$	μ and ν are equivalent, 156
\mathbb{N}, \mathbb{N}_0	$\mathbb{N} = \{1, 2, 3, \dots\}$, $\mathbb{N}_0 = \mathbb{N} \cup \{0\}$
$\mathcal{N}_{\mu, \sigma^2}$	normal distribution, 47, 302
$d\mu/d\nu$	Radon-Nikodym derivative, 157
Ω	space of elementary events on which \mathbf{P} is defined
\mathbf{P}	generic probability measure
$\mathbf{P}[A B], \mathbf{P}[A \mathcal{F}]$	conditional probabilities, 170, 173
$\mathbf{P}_X = \mathbf{P} \circ X^{-1}$	distribution of the random variable X , 44
Poi_λ	Poisson distribution with parameter $\lambda \geq 0$, 46, 302
$p^n(x, y) = p^{(n)}(x, y)$	n -step transition probability of a Markov chain, 353
$\mathcal{P}_{S,T}^n, \mathcal{P}_T^n$	see page 485
φ_X	characteristic function of the random variable X , 300
ψ_X	generating function of the random variable X , 77
\mathbb{Q}	set of rational numbers
\mathbb{R}	set of real numbers
$\overline{\mathbb{R}} = \mathbb{R} \cup \{-\infty, +\infty\}$	two point compactification of the real numbers
Rad_p	$= p\delta_1 + (1-p)\delta_{-1}$ Rademacher distribution, 45
$\text{Re}(z)$	real part of $z \in \mathbb{C}$, 293
$\text{sign}(x)$	$= \mathbb{1}_{(0, \infty)}(x) - \mathbb{1}_{(-\infty, 0)}(x)$, sign of $x \in \mathbb{R}$, 38
$\sigma(\cdot)$	σ -algebra or filtration generated by \cdot , 6, 35, 191
τ_x^k	time of the k th visit of a Markov chain at x , 361
$\mathcal{T}(\cdot)$	tail σ -algebra, 63
\mathcal{U}_A	uniform distribution on A , 13, 34, 302
$V^1(G), V^2(G)$	variation and square variation of G , 483, 485
$\text{Var}[X]$	variance of the random variable X , 101
v-lim	vague limit, 252
w-lim	weak limit, 252
X^τ	stopped process, 210
$\langle X \rangle$	square variation process of X , 206, 485, 489, 493

$f(t) \sim g(t), t \rightarrow a$	$: \iff \lim_{t \rightarrow a} f(t)/g(t) = 1$
$X \sim \mu$	the random variable X has distribution μ , 44
$x \vee y, x \wedge y, x^+, x^-$	maximum, minimum, positive part, negative part of real numbers, 38
$\lfloor x \rfloor, \lceil x \rceil$	floor and ceiling of x , 37
\bar{z}	complex conjugate of $z \in \mathbb{C}$, 293
\mathbb{Z}	set of integers
$\stackrel{\mathcal{D}}{=}$	equal in distribution, 44
$\xrightarrow[n \rightarrow \infty]{\mathcal{D}}, \xrightarrow[n \rightarrow \infty]{n}$	convergence of distributions, 255
$\xrightarrow[n \rightarrow \infty]{\text{fdd}}, \xrightarrow[n \rightarrow \infty]{\text{fdd}}$	convergence of finite-dimensional distributions, 471
$\xrightarrow{\text{meas}}, \xrightarrow{\text{a.s.}}, \xrightarrow{\text{a.e.}}$	convergence in measure, almost surely, and almost everywhere, 130

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