

Index

A

acceptance sampling, 232, 359
addition rule, 50–51
airline overbooking, 199–200
APPL, vii, 132–136

B

Bayes law, *see* rule of Bayes
Bayes, Thomas, 70
Benford distribution, 181, 236–238, 291, 293, 545
Benford's law, *see* Benford distribution
Benford, Frank, 236
Bernoulli distribution, 190–192, 291, 293, 387, 434, 545
Bernoulli trial, 191–193, 204, 211, 358
Bernoulli, Jakob, 202
beta distribution, 279–284, 291, 293, 483, 545
beta function, 280, 477
beta–binomial distribution, 284, 545
bimodal distribution, 146
binomial coefficient, 23
binomial distribution, 106, 192–204, 284, 364–365, 395, 545
binomial random experiment, 193
binomial theorem, 23, 37
birthday problem, 1–2, 58–59
bivariate distributions, 303–378
bivariate hypergeometric distribution, 314
bivariate normal distribution, 367–378
 conditional distributions, 371
 joint moment generating function, 371, 378
 marginal distributions, 370
 matrix formulation, 374–378
 population concentration ellipse, 368–369
 variance–covariance matrix, 375
 variate generation, 373–374, 376–378
Bonferroni's inequality, 52, 81
Box, George, 271

Box–Muller algorithm, 478–480, 539
boxplot, 9
Buffon's needle problem, 329–332, 423, 424

C

calculating probability, *see* probability calculation methods
Cantor, Georg, 28
car and goats problem, *see* Monty Hall problem
catch and release program, 233–234
Cauchy distribution, 144, 161, 475, 528, 545
Cauchy–Schwarz inequality, 428
causation, 348
central limit theorem, 4, 455, 535–544
characteristic function, 164
Chebyshev's inequality, 167–169, 201, 522–523
chi-square distribution, 268, 275, 291, 293, 500, 545
combinations, *see* counting techniques
combinatorics, *see* counting techniques
complement operation, *see* sets
complementary probability, 49
computer algebra system, *see* APPL
computing probabilities, 55–63
conditional distribution, 318–323, 384–386
conditional expected value, 350–360
conditional probability, 63–70
 definition, 64
 examples, 65–68
conjunction fallacy, 49–50
continuous random variables, *see* random variables
convergence in distribution, 524–535
convergence in probability, 520–524
convolution formula, 503
copula, 384–386
correlation, *see* population correlation
correlation and causation, 348
correlation matrix, 9