STA4322/5328 - Commonly Used Notation and Abbreviations

Symbol/notation	description or definition
Abbreviations and Acronyms	
rv	random variable
i.i.d. or iid	independent and identically distributed
cdf	cumulative distribution function (or df)
df	distribution function; also used for "degrees of freedom"
ecdf	empirical (cumulative) distribution function, $\widehat{F}_n(x)$
pdf	probability density function (for continuous rvs)
pmf	probability mass function (for discrete rvs)
wrt	with respect to (e.g., a derivative wrt x)
iff	if and only if
def	definition
CLT	the Central Limit Theorem
CI	confidence interval
Notation and Symbols	
$Pr(A)$	probability of a random event A
$\mathbb{R}$	real line
$supp(f)$	support of a pmf/pdf f: $supp(f) = \{x : f(x) \neq 0\}$
$\mathbb{I}(x \in A)$	indicator function of the set A
$\sum_{i=1}^n a_i$	sum: $a_1 + a_2 + \cdots + a_n$
$\prod_{i=1}^n a_i$	product: $a_1 \cdot a_2 \cdots a_n$
$\nabla_x f(x)$	the gradient of function f wrt x
$X_n \to^D X$	a sequence of rvs $X_1, X_2, \ldots$ converges to a rv X in distribution
$X_n \to^P X$	a sequence of rvs $X_1, X_2, \ldots$ converges to a rv X in probability
$\lceil x \rceil$	the ceiling function: take x and round up to the closest integer e.g., $\lceil 1.1 \rceil = 2$, $\lceil 2 \rceil = 2$
$\lfloor x \rfloor$	the floor function: take x and round down to the closest integer e.g., $\lfloor 1.1 \rfloor = 1$, $\lfloor 2 \rfloor = 2$
$\max_x f(x)$, $\min_x f(x)$	maximum/minimum values that the function f attains
$x^* = \arg\max_x f(x)$	x^* is the maximizer of f - the value of x at which $f(x^*) = \max_x f(x)$
$X \sim F_\theta$	the rv X has cdf F_θ
$X =^D Y$	the rvs X and Y are "equal in distribution" (i.e., have the same cdf)
Φ	(capital phi) - the $Normal(0,1)$ cdf
$Student(\nu)$	Student's t distribution with ν degrees of freedom
χ^2_p	a chi-squared rv or cdf with p df, depending on the context
$F_{p,q}$	the (Snedecor) F distribution with p df in the numerator and q df in the denominator
Greek Letters	
σ, Σ	lower- and upper-case sigma
μ	lower-case mu
χ	lower-case chi (pronounced as "ky")
θ, Θ	lower- and upper-case theta
λ	lower-case lambda
γ, Γ	lower- and upper-case gamma
τ	lower-case tau
ν	lower-case nu
β	lower-case beta
ψ, Ψ	lower- and upper-case psi
ϕ, Φ	lower- and upper-case phi