Table 1: Table of Notation conventions

type	desciption	common example
optimization variable (scalar)	lower-case letter	x, y
optimization variable (vector)	lower-case letter with $\backslash vec$	$\vec{x}$, $\vec{y}$
optimization variable (matrix)	upper-case letter with $\backslash vec$	A, B
element	subscript	x_i, A_{ij}
column vector	comma separated parentheses tuple	$(1, 2, 3)$
row vector	space separated square bracket list	$(1, 2, 3) = [1\ 2\ 3]^\top$
random variable	upper-case letter	X, Y
random variable vector	upper-case letter with $\backslash vec$	$\vec{X}$, $\vec{Y}$
common set	upper-case letter with $\backslash mathbb$	$\mathbb{R}$, $\mathbb{Z}$
set	upper-case letter with $\backslash mathcal$	$\mathcal{S}, \mathcal{T}$
function	lower-case letter	$f, g : \mathbb{R}^n \to \mathbb{R}^m$
online algorithm	*mathrsfs:* $\backslash mathscr$	$\mathscr{A}$
regret	$\backslash mathfrak$	$\mathfrak{R}$
competitive ratio		π
dual variables		λ, μ
dual function		$D(\lambda)$
Lagrangian function		$\mathcal{L}$
step size		α, β
integer interval		[N] = {1,2,. . . ,N}