abaisero.typ

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1) Commands

1.a) Math Commands

Symbol	Command	Description	Example
$\mathbb{N}$	naturalset	the set of natural numbers	$\mathbb{N} := \{0, 1, 2, 3, ...\}$
$\mathbb{Z}$	integerset	the set of integer numbers	$\mathbb{Z} := \{0, 1, -1, 2, -2, ...\}$
$\mathbb{R}$	realset	the set of real numbers	$\sqrt{2} \in \mathbb{R}$
*	kstar	the Kleene star operator	$\mathcal{X}^* := \cup_{k=0}^{\infty} \mathcal{X}^k$
$^+$	kplus	the Kleene plus operator	$\mathcal{X}^+ := \cup_{k=1}^{\infty} \mathcal{X}^k$
softmax	softmax		
softmin	softmin		
sign	sign		$x = \text{sign}(x) \cdot \lvert x \rvert$

1.b) Linalg Commands

Symbol	Command	Description	Example
diag	diag		
rank	rank		
tr	trace		$\text{tr}(M) := \sum_{i=1}^{n} M_{ii}$
col	colspace		
ker	nullspace	Nullspace (a.k.a. kernel) of a linear mapping	
span	spanspace		
$^\top$	tr	Transpose	symmetric $M \implies M = M^\top$
$^{-1}$	inv	Inverse	invertible $M \implies MM^{-1} = I$
$^+$	pinv	Pseudo-inverse	$MM^+M = M$
$^{-\top}$	it	Inverse transpose	$M^{-\top} = (M^{-1})^\top = (M^\top)^{-1}$
$^{+\top}$	pit	Pseudo-inverse transpose	$M^{+\top} = (M^+)^\top = (M^\top)^+$

1.c) Optim Commands

Symbol	Command	Description	Example
argmax	argmax		$\text{argmax}_a Q^\pi(s, a)$
argmin	argmin		$\theta^* := \text{argmin}_\theta \mathcal{L}(\theta)$
*	opt	Optimality superscript	$\pi^*(s) = \text{argmax}_a Q^*(s, a)$

1.d) Stats Commands

Symbol	Command	Description	Example
$\mathbb{C}$	Cov	Covariance	$\mathbb{C}(x, y) = \mathbb{E}[xy] - \mathbb{E}[x]\mathbb{E}[y]$
$\mathbb{H}$	Ent	Entropy	$\mathbb{H}[x] = -\mathbb{E}[\log \Pr(x)]$
$\mathbb{E}$	Exp	Expectation	$\mathbb{E}[f(x)] = \sum_x \Pr(x) f(x)$
$\mathbb{I}$	Ind	Indicator function	$\Pr(x = 0) = \mathbb{E}[\mathbb{I}[x = 0]]$
KL	KL	KL-divergence	$\mathrm{KL}(p \parallel q) \coloneqq \mathbb{E}_{x \sim p}\left[\log\left(\frac{p(x)}{q(x)}\right)\right]$
D_{KL}	DKL	KL-divergence (alternative)	
$\mathbb{I}$	MI	Mutual Information	
$\mathbb{V}$	Var	Variance	$\mathbb{V}[x] = \mathbb{E}[x^2] - \mathbb{E}[x]^2$

1.e) Dists Commands

Symbol	Command	Description	Example
Categorical	Categorical		
Dirichlet	Dirichlet		
Normal	Normal		
Uniform	Uniform		

1.f) ML Commands

Symbol	Command	Description	Example
$\mathcal{D}$	data	Data set	$\mathcal{D} \coloneqq \left\{\left(x_i, y_i\right)\right\}_{i=1}^N$
$\mathcal{L}$	loss	Loss function	$\mathcal{L}(\theta; x, y) = \frac{1}{2}\|y - f(x; \theta)\|^2$
nll	nll	Neg-log-likelihood	$\mathrm{nll}(x) \coloneqq -\log \Pr(x)$
MSE	mse	Mean-squared-error	

1.g) RL Commands

Symbol	Command	Description	Example
$\mathcal{A}$	aset	Action set	
$\mathcal{B}$	bset	Belief set	$\mathcal{B} \subseteq \Delta\mathcal{S}$
$\mathcal{H}$	hset	History set	$\mathcal{H} \coloneqq (\mathcal{A} \times \mathcal{O})^*$
$\mathcal{O}$	oset	Observation set	
$\mathfrak{R}$	rset	Reward set	$\mathfrak{R} \subseteq \mathbb{R}$
$\mathcal{S}$	sset	State set	
ε	nohistory	Empty history	
π	policy	Policy	$\pi : \mathcal{H} \to \Delta\mathcal{A}$
Q^π	qpolicy	Policy Q function	$Q^\pi : \mathcal{H} \times \mathcal{A} \to \mathbb{R}$
$\hat{Q}$	qmodel	Parametric Q model	$\hat{Q}(h, a; \theta)$
V^π	vpolicy	Policy V function	$V^\pi : \mathcal{H} \to \mathbb{R}$
$\hat{V}$	vmodel	Parametric V model	$\hat{V}(h; \theta)$
U^π	upolicy	Policy U function	$U^\pi : \mathcal{H} \times \mathcal{S} \to \mathbb{R}$
$\hat{U}$	umodel	Parametric U model	$U^\pi(h, s; \theta)$

1.h) Misc Commands

Symbol	Command	Description	Example
$^{(k)}$	iter(k)	Superscript indicating iteration	action $a^{(i)}$
$\to$	to		$f : \mathcal{X} \to \mathcal{Y}$
$\mapsto$	mapsto		function $x \mapsto 10 \cdot x$
$\implies$	implies		$a \land b \implies a$