

Machine Learning and Optimization Cheat Sheet by anlumithe via cheatography.com/177005/cs/36970/

Linear Algebra		Linear regression	
A+B	has result, only if A and B have same dim	Model	$y = X\theta^* + z$
A x =x_1* a_1 ++x_n* a_n	result is vector	Risk	
A*B	row of A times column of B, result is matrix	Ridge regression	
A^{T}	row becomes column and vice versa		
Properties of transpose	(1) if A is $(m \times n) A^{T}$ is $(n \times m)$ (2) $(A^{T})^{T} = A$ (3) $(A+B)^{T} = A^{T} + B^{T}$ (4) $(AB)^{T} = B^{T}A^{T}$ (5) $(tA)^{T} = tA^{T}$	Logistic Regression Support Vector Machines	
Inverse of Matrix	$AA^{-1}=I=A^{-1}A$		
Properties of invertible matrix	$(A^{-1})^{-1} = A$ $(AB)^{-1} = B^{-1}A^{-1}$ $(A^{T})^{-1} = (A^{-1})^{T}$	Neuronal Networks	
Singular value decomposition	A = UΣV ^T what means that every vector-matrix-multiplication can be viewed as a 3 step process (1) rotation into space V (2) scaling by singular value (3) rotation into new space U		
Eigen value decomposition	A = QAQ^{-1} this is only possible, if A and Q are square matrices		



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