Week 1 Q&A

Wednesday, 4 November 2020 12:06

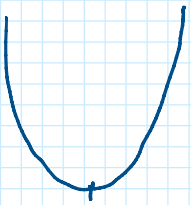
$$\vec{y} = A\vec{x} = \sum_j A_{:j} x_j$$

$$y_i = (A\vec{x})_i = \sum_j A_{ij} x_j$$

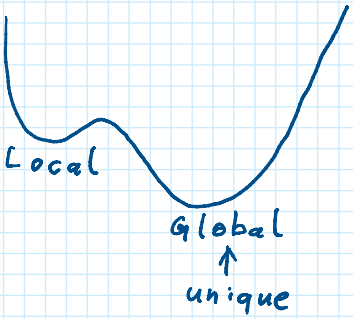
$$C = AB \Leftrightarrow C_{ik} = \sum_j A_{ij} B_{jk}$$

$$BA \qquad \sum_j B_{jk} A_{ij}$$

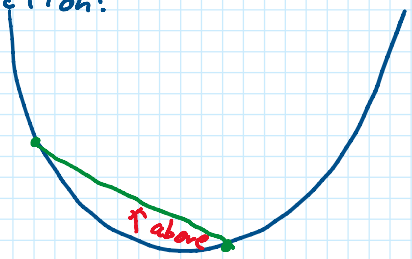
i) Convex



Non-convex



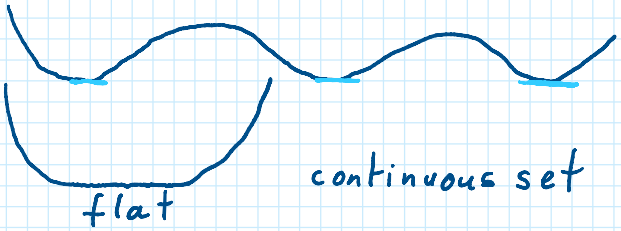
Convexity Function:



ii) Non-unique optima:

a)

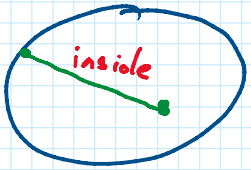
b)



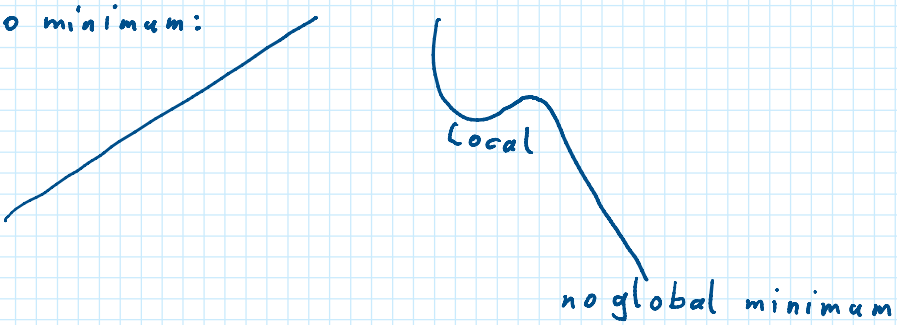
equal

continuous set

Set:



iii) No minimum:



Random variables A, B, C

$$p(a|b,c) = p(A=a \mid B=b, C=c)$$

$$p(a) = f_A(a)$$

$$p(a) = p(A=a)$$

Sum rule

$$p(a) = \sum_b p(a,b)$$

$$p(\text{sick}) = p(\text{sick}|\text{pan})p(\text{pandemic}) + p(\text{sick}|\neg\text{pandemic})p(\neg\text{pandemic})$$

Product rule

$$p(a,b) = p(a|b)p(b)$$, if a & b independent: $p(a,b) = p(a)p(b)$

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$p(a,b) = p(a|b)p(b)$, if a & b independent: $p(a,b) = p(a)p(b)$

$\Rightarrow p(a|b) = p(a)$

$$p(a|b,c) = p(a|b \cap c) = p(A=a \,|\, B=b \wedge C=c)$$

value

$\cap$ event

random variable (discrete or continuous)

What if $p(b,c) = 0$?

$p(a,b,c) = p(a|b,c)\,p(b,c)$

$\downarrow$ 0 ill defined $\downarrow$ 0