Matrix derivatives
Graded Quiz • 20 min

Matrix derivatives
TOTAL POINTS 3

1. Question 1
Choose the correct statements about MLP implementation:

() You shouldn't prefer matrix operations when working with GPU

(**X**) A forward pass of a dense layer can be done with matrix product

(**X**) You can write both passes of a dense layer with NumPy and make it quick even in Python

() A backward pass of a dense layer needs a 4-d tensor derivative

1 point

2. Question 2
How many dimensions will a derivative of a 3-d tensor by a 4-d tensor have?

7

1 point

3.Question 3
Let's play around with matrix derivatives!

A trace Tr(X) of a matrix X is a sum of its diagonal elements.

For example: Tr(1331)=1+1=2. Note that trace is a scalar!

Let's find a matrix notation for ∂Tr(X^2)∂X for matrix X=(x1,1 x2,1 x1,2 x2,2), where X^2 is a matrix product X \cdot X.

Please do this element-wise and figure out a matrix notation for it:

() 2X

(**X**) X^TX

() 2Tr(X^T)

() Tr(2X)

() 2X^T

1 point

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