Questionnaire (6th chapter)

Total de pontos 0/0

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How could multi-label classification improve the usability of the bear classifier? *

it can improve the usability of the bear classifier by enabling it to classify images containing multiple types of bears or images with both bears and other objects

How do we encode the dependent variable in a multi-label classification problem? *

in multi-label classification, the dependent variable is typically encoded as a binary array or a one-hot encoded matrix

How do you access the rows and columns of a DataFrame as if it was a matrix? *

to access the rows and columns of a DataFrame as if it were a matrix, we can use the '.iloc' attribute, which allows us to index the DataFrame using integers for rows and columns

How do you get a column by name from a DataFrame? *

['variable'] with the column name as a string

What is the difference between a `Dataset` and `DataLoader`? *

Dataset represents a collection of data while the DataLoader is responsible for loading and batching the data for efficient processing in deep learning models.

What does a `Datasets` object normally contain? *

normally contains one or more PyTorch datasets

What does a `DataLoaders` object normally contain? *

normally contains training and validation DataLoader objects that provide batches of data for model training and evaluation

What does `lambda` do in Python? *

create small anonymous functions

What are the methods to customize how the independent and dependent variables are created with the data block API? *

block: the type of block to use for processing the data
split: how to split the data into training and validation sets
label: to create the dependent variable (label) for the data
transform: specifies how to apply transformations to the data
databunch: creates a DataBunch object from the data block

Why is softmax not an appropriate output activation function when using a one hot encoded target? *

softmax function leads to each output neuron predicting independently of each other, and hence reducing the capacity of the neural network to capture the correlation between different output classes

Why is `nll_loss` not an appropriate loss function when using a one-hot-encoded target? *

nll_loss is not an appropriate loss function when using a one-hot-encoded target because it assumes that the target is a class index, not a one-hot-encoded vector. Instead, we should use BCEWithLogitsLoss or BCELoss, which are designed for multi-label classification problems with binary cross-entropy loss

What is the difference between `nn.BCELoss` and `nn.BCEWithLogitsLoss`? *

because the nll_loss function assumes that the target is not one-hot-encoded and expects a single index of the target as input, whereas the one-hot hide has multiple indexes for each target. Thus, it is necessary to first convert the one-hot encoding to an integer index before using nll_loss, which can be inefficient

Why can't we use regular accuracy in a multi-label problem? *

we can't use regular accuracy in a multi-label problem because multiple labels can be predicted for a single instance

When is it okay to tune a hyperparameter on the validation set? *

it is okay to tune a hyperparameter on the validation set when the validation set is sufficiently large and representative of the test set

What is a regression problem? What loss function should you use for such a problem? *

a regression problem is one where the model predicts a continuous numerical value, and the appropriate loss function to use for such a problem is typically mean squared error [MSE]

What do you need to do to make sure the fastai library applies the same data augmentation to your inputs images and your target point coordinates? *

to ensure that the fastai library applies the same data augmentation to both input images and target point coordinates, you need to use a custom Transform that applies the same random transformation to both the input image and the corresponding target points