2018033_CV_HW16

Q) Differentiate between Multi-class classification and Multi-label classification.

Multi-class classification	Multi-label classification
Given an image, the aim is to assign it to **a single class** of images out of the set of classes used during training the model.	Given an image, the aim is to find related **label(s)** for the image out of a set of labels used during training the model.
The last layer activation function used is usually the **softmax** function. Thus converting the activations to probabilities that are in the range 0 to 1 and that sum up to 1. This ensures probabilistic consistency since we only want to predict a single class.	The last layer activation function used is usually the **sigmoid** function. This converts the activations to independent probabilities for the specific labels to the range 0 to 1. This way we get the probabilities for the independent existence of every label.
The target vector is a **one-hot encoded vector with a single 1** in it.	The target vector is a **one-hot encoded vector with multiple 1s** in it.
The loss function commonly used is the **categorical cross-entropy loss**. This depicts the fact that we are only interested in knowing the confidence with which the desired class is being predicted. Thus taking it into account while penalizing the model.	The loss function commonly used is the **binary cross-entropy loss**. This depicts the fact that we are interested in knowing the confidence with which every label, desired or undesired, is being predicted. Thus taking them into account while penalizing the model.