## Sample Dataset

You are given a sample dataset 'sample_dataset_for_testing.tar.gz' . This is an anonymized sample Chest CT scan data. The dataset has 10 folders (subset[0-9]mask). Each subsetmask folder has one or many patient folders. Each patient folder has many tiff files. The tiff files numbering starts from 0.tiff , 1.tiff, 2.tiff ,….. N.tiff. Each tiff file represents a Chest CT slice. All slices **together** represent a 3D CT Chest scan for a patient.

In each patient folder, you are also given n_mask.tiff files (n is an integer) wherever a mask is present. A mask file is a binary tiff file which represents the location of abnormality. So for example, if a mask file is of size 512 x 512 and out of all 262144 pixels, if 20 pixels have intensity > 0 , then it means that abnormality is present in these 20 pixels. Note that the mask file 'n_mask.tiff' is indicating the location of abnormality in 'n.tiff' slice.
If a patient is normal, then there will not be any mask file present in his/ her folder.

## Problem Statement

You goal is to design a Convolutional Neural Network to identify abnormalities in 3D Chest CT scans. So, given a test patient folder containing many tiff files, your network should be able to detect the location of abnormalities (similar to how a radiologist checks a patient's 3D CT scan and marks abnormalities).

Since you have a small dataset, your model will not be robust. The goal of this exercise is not to test model's robustness but to test your basic Python and deep learning skills.

You can model the problem either as a segmentation or bounding box or pixel classification or any other way. You have the freedom to choose any standard architecture or design a small network from scratch.

We want you to write a **Python** code for reading data, preprocessing and postprocessing. We want you to use a deep learning framework like PyTorch / Tensorflow / Caffe / Torch / Keras / Theano ( preferably PyTorch ) for training your network.
You can split the dataset into training , validation and test as you wish.

Remember , this is an exercise to test your python programming and basic deep learning modeling skills. You need not train your model for convergence or accuracy.

Best of Luck !!