Problem Statement

Using Teacher-Student networks to solve the Chest CT scan problem at hand while being computationally and memory-wise efficient for higher accuracies than usual methods and architectures of the same size.

We propose the following methods to improve performance:

1. **Multi Teacher/Single Teacher and/or Multi Student/Single Student model:**
   We can test the 4 combinations on a set of neural networks to see which of the combinations is computationally and memory-wise inexpensive for the accuracy that it is achieving.

2. **Adding Middle networks**
   On Distillation of knowledge between a teacher and student network where the difference of parameters is too much, there are instances of a lot of useful information being lost in the compression in between. The solution to this is adding middle networks that act as midlevel knowledge compressions that limit the knowledge which may be lost between compressions.

3. **Better Teacher and Student Architectures**

We wish to model the smaller and bigger networks on already-existing architectures which gave better results to a problem statement because of the better architecture, we believe that using the better architecture in addition to the knowledge distillation method will give us higher accuracies.

4. **Bigger Datasets, pre-trained weights training, Bayesian optimization, etc.**
   We wish to use the common methods of increasing performance and accuracies of networks to ultimately give better outputs and results to our problem statement.