**Day 53**

**What to do?**

Learn about transfer learning.

**Transfer learning:**

Transfer learning is the process of taking the knowledge from a neural network that has already learned from another task and applying that knowledge to another task.

For instance, say that you already have a network build for image recognition (cat or dog). Now, you have a new problem statement, where you are classifying radiology diagrams to determine whether the patient has cancer or not. What transfer learning does is take the network built from first hidden layer to last hidden layer (not the output layer), give the radiology diagrams input and randomly initialize weights at the last hidden layer to produce outputs to the output layer.

A circuit board

Description automatically generated

Diagram

Description automatically generated

In simpler words, the same network is taken but change the features of X (input), and randomly initialize the weights at layer L and train the network.

If it is a small data, you could retrain first few layers, however, if it is a huge data, retrain all the layers. Transfer learning is usually helpful when you have **large** data that you are transferring from and have **less** data that you transferring to (inverse is not so helpful)