+ Transfer Learning

When a neural network has learned to perform one task, and its adapted to a new task.

We delete the weights and last layers and make it output what we want.

↳ We also substitute the dataset. We can retrain the new layer only or the whole net.

The old network is Name (Pre-Training)

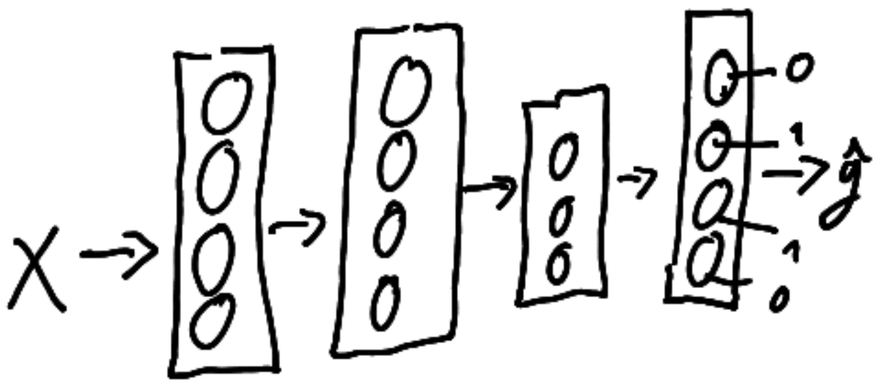
The New network is more (Fine-Tuning)

- When does Transfer learning make sense:
  + Task A and B have the same input X
  + You have a lot more data for Task A, than Task B.
    ↳ Task A "weights a lot len"
  + Low level of features from A could be helpfull for learning B.

+ Multi - Task Learning:

Having a neural network do several things at the same time, and each of the tasks helps hopefully all other tasks.

- Architecture



where 0, and one 1 are the results i.e more than one thing is being predicted.

Unlike softmax, it can have multiple labels

Loss: $\hat{y}^{(i)}_{(4,1)} \Rightarrow \frac{1}{m}\sum_{i=1}^{m}\sum_{j=1}^{4} L(\hat{y}_j^{(i)}, y_j^{(i)})$

- When does multi-task learning make sense:
  + Training on a set of tasks that could benefit from having shared lower-level features.
  + Usually: Amount of data you have for each task is quite similar
  + Can train a big enough neural network to do well on all the tasks.