Notes Video **Lesson 7: Practical Deep Learning for Coders 2022**

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<https://course.fast.ai/Lessons/lesson7.html>

Gradient accumulation:

* Update weights only when reaching the threshold of batch size, even if passing only a lower number of items per batch.
* Aka, don't update weights every iteration of the loop
* Allows using less powerful GPU
* Different architectures => different batch sizes => different learning rates

Ensembling:

* Take the average of multiple models
* Possible to give different weights to models in ensembles, like higher to more accurate models.

Nvidia cards:

* RTX consumer-grade cards are just as good as enterprise cards, but much cheaper because of licensing regulations. U need enterprise ones in data centers.

Multi-target:

* In the data loader, possible to put more than 2 blocks, and have multiple targets
* Set number of inputs, the rest will be outputs
* In get\_y, put more than 1 label
* Sometimes multi-target models become better at predicting one target than a model predicting only that target

Vision learner automatically chooses the loss function

Collaborative filtering deep dive:

* Create factors for users ahead of time, without knowing what they are
* Dot product between user and rating
* Latent factors: not knowing what abt movies matters to ppl, but use SGD to find it
* Mathematically CF is a matrix completion problem

OOP for Collaborative filtering:

* Class is the key concept of OOP

Weight decay or L2 regularization:

* Add the sum of all weights squared to your loss function
* Helps with overfitting
* Fast ai can not set defaults bcs it doesn't know enough abt the data, set parameters yourself, and experiment.