Introduction to Deep Learning (I2DL)

Tutorial 3: Datasets

Today's Outline

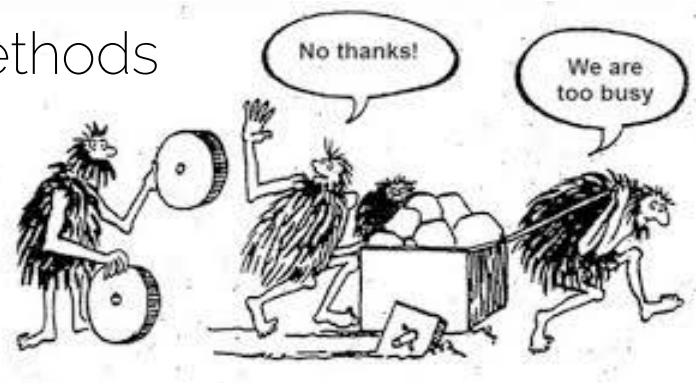
- Exercises outline
  - Reinvent the wheel
  - Pillars of Deep Learning
- Contents of the first python exercise
  - Example Datasets in Machine Learning
  - Dataloader
  - Exercise 3 (Submission #1)
- Outlook exercise 4

Reminder

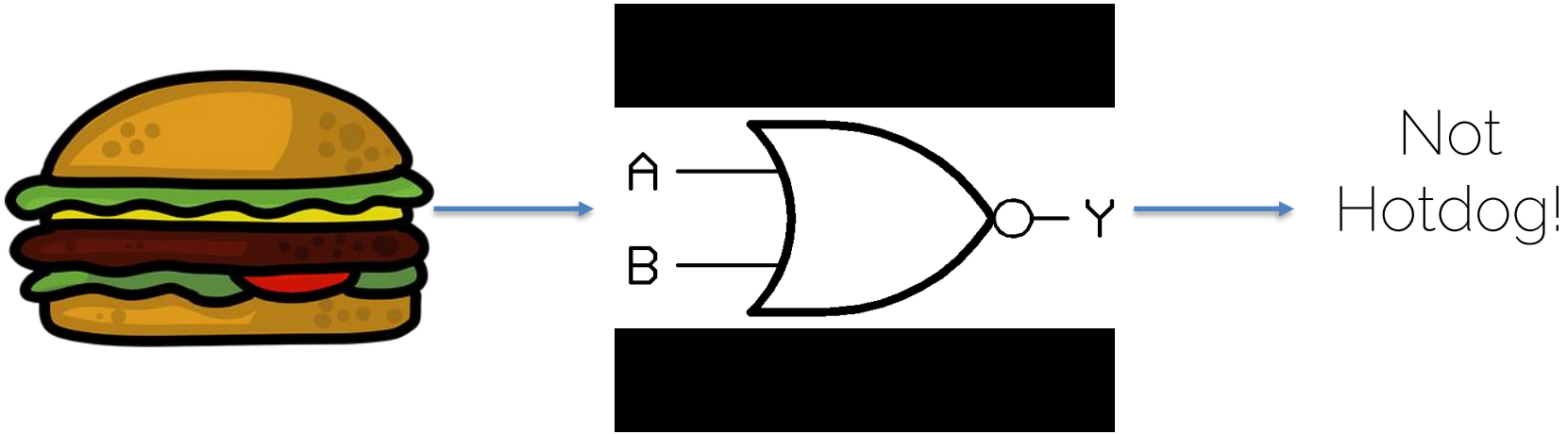
- Unregistered TUM/LMU students
  - Link to Google Form available on our website
- Use Piazza for questions and private questions
- Office hours started this week!
  - Schedule on Piazza
- Solutions
  - will be published together with following exercises

Your task for the exercises 3-5

- Implementation of
  - Classic datasets and data loading
  - Classification pipeline using
    - Traditional machine learning methods
    - Neural Networks
      - Layers
      - Optimizers
      - Etc.
- "Reimplement the wheel"

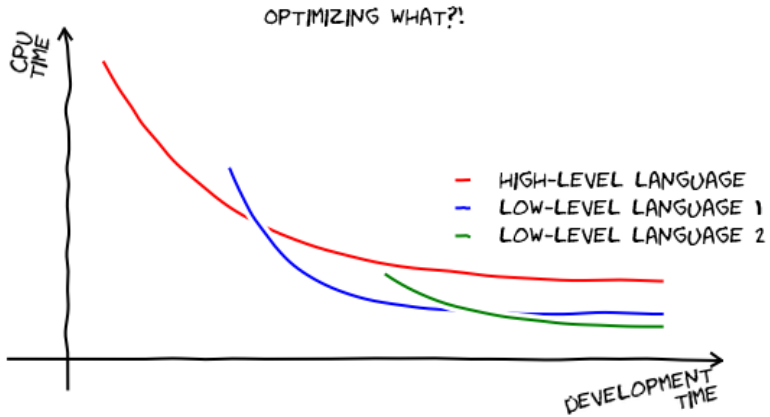


Why spend the effort?

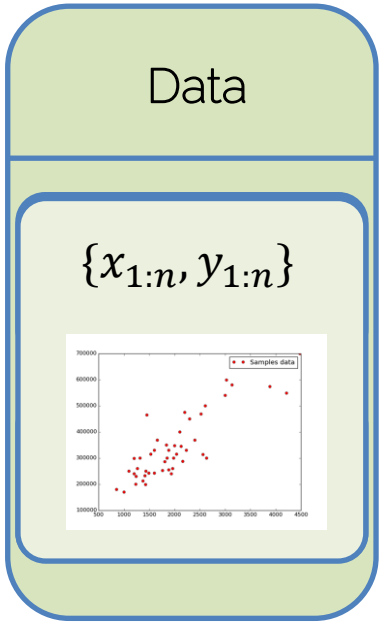


Why Python?

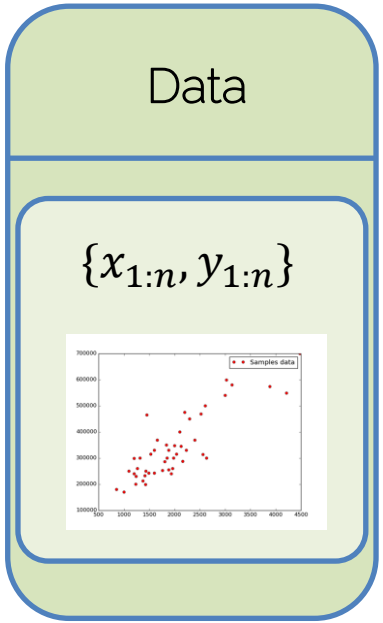
- Why python:
  - Very easy to write development code thanks to an intuitive syntax
  - Biggest language used in deep learning research (and probably production)



The Pillars of Deep Learning

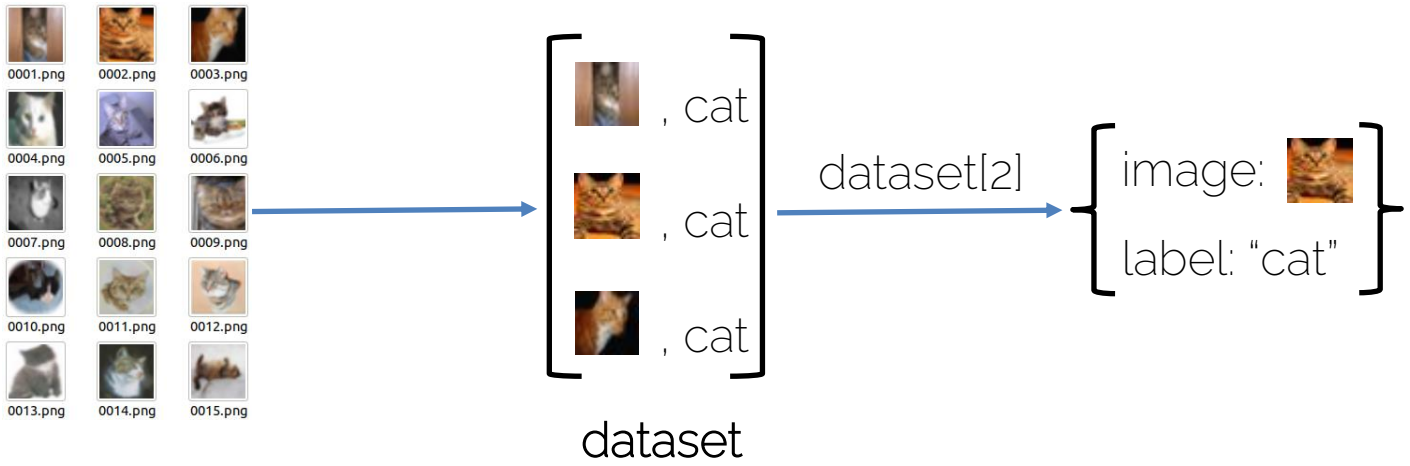


The Pillars of Deep Learning



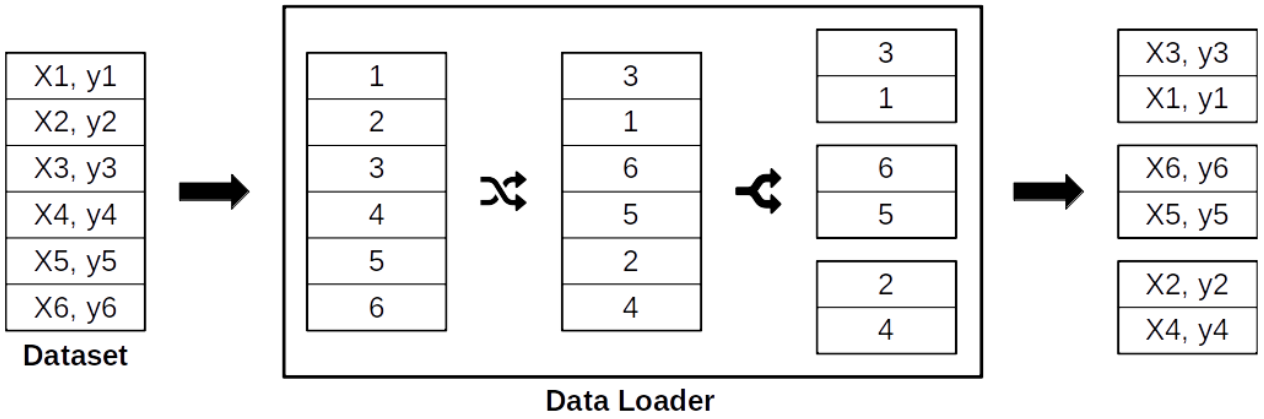
Exercise 3: Dataset

- Stores the data in an efficient, accessible form
- Performs data preprocessing steps using Transforms
- Example: Image Folder Dataset



Exercise 3: Dataloader

- Defines how to load the dataset for model training
- Shuffles the dataset
- Splits the dataset into small subsets



Overview Exercise 3

- Two notebooks
  - Dataset: CIFAR10
  - Dataloader

Fixed Deadline:
November 10, 2021
15:59

- First "real" Submission
  - Have to implement parts of both objects
  - Single submission file creation in Dataloder notebook

Hitchhiker's Guide: Notebooks

1. Run cells from top to bottom
2. Be careful when changing notebook cells
3. Don't code outside our boxes

```
################################################################################
# TODO                                                                         #
# Implement the dummy machine function.                                        #
#                                                                              #
################################################################################
pass
################################################################################
#                             END OF YOUR CODE                                 #
################################################################################
```

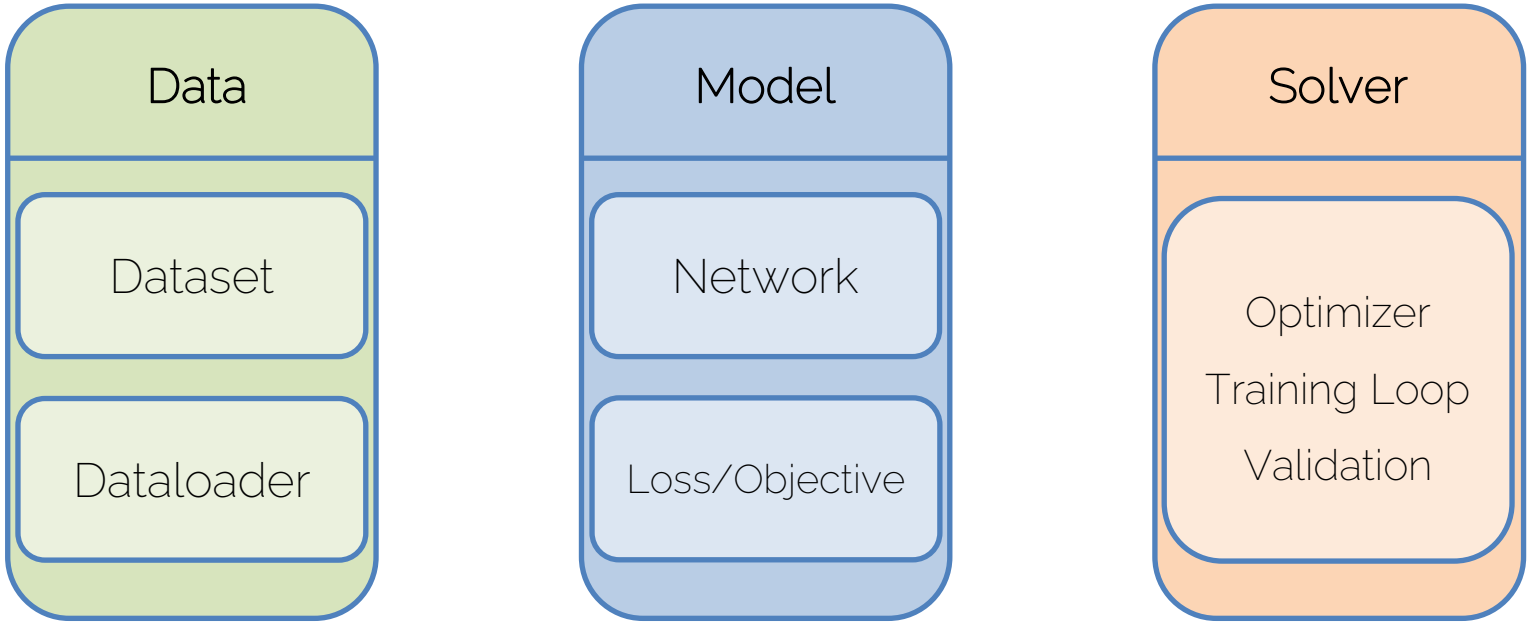
Hitchhiker's Guide: Notebooks

1. Run cells from top to bottom
2. Be careful when changing notebook cells
3. Don't code outside our boxes
4. Checking other code
   - Generally optional
   - Look out for green boxes

Task: Check Code

Please read `make_dataset(directory, class`
tasks. Additionally, it would be wise decision to ge
projects. As it is not beginner friendly, we removed i

The Pillars of Deep Learning



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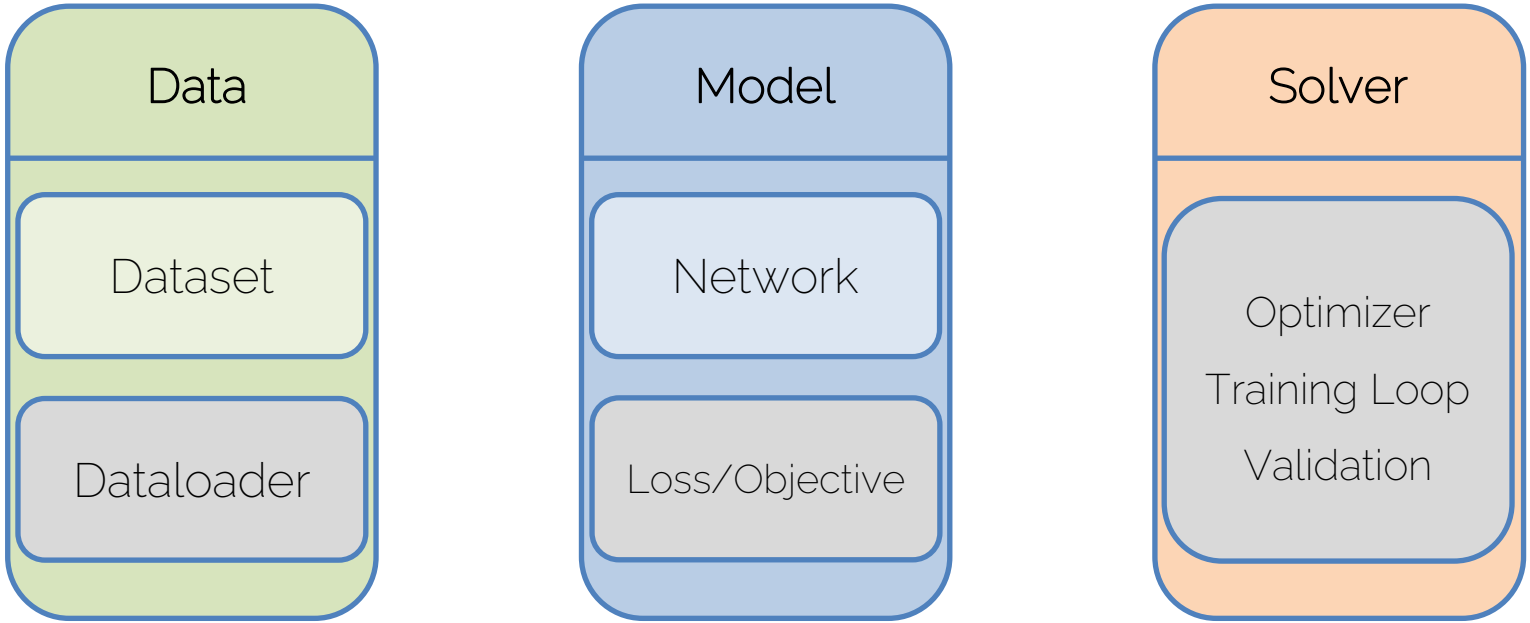
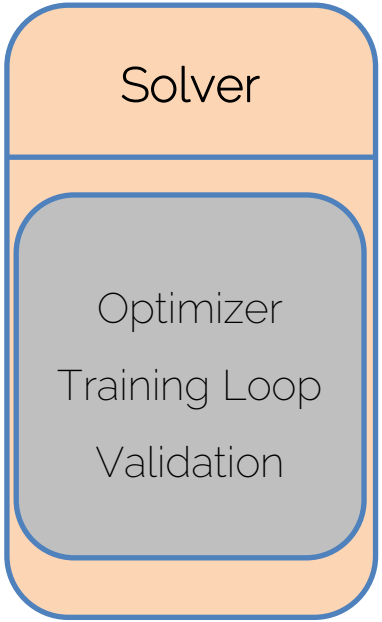


Can be implemented once and used in multiple projects

Upcoming Lectures

- **Next lecture:**
  Lecture 4: Backpropagation

- **Next Thursday:**
  Exercise 4: Solver (and first network)



Summary

- Monday 08.11: Watch Lecture 4
  - Optimization and Backpropagation
- Wednesday 10.11 15:59: Submit exercise 3
  - Dataloader
- Thursday 11.11: Tutorial 4
  - Solver + Backprop

See you next week