

# Introduction to the Labs

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# Labs

- ▶ Mix of theoretical and practical exercises
- ▶ Not graded! Only final exam counts
- ▶ Exercises posted on Moodle on Tuesday
- ▶ Solutions on Friday
  - ▶ Only presented on popular demand
- ▶ Lab sessions exist to discuss and ask questions
  - ▶ Attend not to fall behind the schedule
- ▶ I will leave the Zoom call if nobody shows up in the first ten minutes

# Theory-oriented Exercises

- ▶ Apply the math you see in the lectures
  - ▶ Pen-and-paper exercises on simple cases
  - ▶ Code the solution and test on simple problems
  - ▶ Brush up your linear algebra!
- ▶ Purpose:
  1. Understand and internalize how things work
  2. Get practical experience in implementing ML algorithms
  3. Get ready for the exam

# Practice-oriented Exercises

- ▶ Play with neural networks
  - ▶ [github.com/jjallaire/deep-learning-with-r-notebooks](https://github.com/jjallaire/deep-learning-with-r-notebooks)
  - ▶ [github.com/fchollet/deep-learning-with-python-notebooks](https://github.com/fchollet/deep-learning-with-python-notebooks)
- ▶ Purpose:
  1. Learn to use a popular Deep Learning Framework
  2. Get a feeling for how neural networks behave
- ▶ Handouts in R, Python is also accepted (and encouraged)

# Our software stack

1. Keras for R
2. Keras for Python
3. Tensorflow (Python bindings)
4. Tensorflow (C++)
  - ▶ CPU computations: BLAS (C/Fortran)
  - ▶ GPU computations: cuDNN (C)
  - ▶ TPU computations: Private Google library