

## **Problem Set 1, Feb 25, 2022** **(Convexity, Python Setup)**

### **Convexity**

Solve Exercises 2, 3, 4, 5, 8, 10 from the lecture notes.

### **Getting Started with Python**

Many exercises in this course use Python notebooks. We recommend running these notebooks in the cloud using Google Colab. This way, you do not have to install anything, and you can even get a free GPU. If you prefer to work locally, follow the `python_setup_tutorial.md` provided on our GitHub repository.

The first practical exercise is a primer on NumPy, a scientific computing library for Python. You can open the corresponding notebook in Colab with this link:

[colab.research.google.com/github/epfml/OptML\\_course/blob/master/labs/ex01/template/numpy\\_primer.ipynb](https://colab.research.google.com/github/epfml/OptML_course/blob/master/labs/ex01/template/numpy_primer.ipynb)

For computational efficiency, avoid `for`-loops in favor of NumPy's built-in commands. These commands are vectorized and thoroughly optimized and bring the performance of numerical Python code (like for Matlab) closer to lower-level languages like C.