Assignment 1
Removing the projective distortion from a perspective image of a plane **(due date: 11/12/2024)**

The goal of this assignment consists of estimating homography between two 2D planes. Students are encouraged to take digital photographs themselves to accomplish this task.

The students are expected to implement **the DLT** and **the normalized DLT** to compute the homographies. Corresponding points can be indicated manually in the images. Students should both consider the minimal case with 4 points and a case with 10 or more corresponding points.

Students are encouraged to implement the solution for this assignment using Matlab. Matlab provides all the necessary function to read, display and manipulate images (try help images and also have a look at the ipextform demo), as well as algorithms for linear least-squares (use svd) and non-linear least squares (lsqnonlin). Matlab also allows obtaining easily coordinates of clicked points (ginput).

The following is a suggested structure for your report, as well as the rubric that we will follow when evaluating reports. You don't necessarily have to organize your report using these sections in this order, but that would likely be a good starting point for most projects.

- **Title, Author(s)**
- **Introduction (10%)**: Describe the problem you are working on, and an overview of your results
- **Methods (40%)**: Discuss your approach for solving the problems. Why is your approach the right thing to do? How to implement your approach?
- **Data (10%)**: Describe the data you are working with for your project. What type of data is it? How to choose the data? Where did it come from? How much data are you working with? Did you have to do any preprocessing to use this data in your project?
- **Experimental results (30%)**: Discuss the experiments that you performed to demonstrate that your approach solves the problem.

You should use known angles, length ratios etc. to test your calculation and include graphs, tables, or other figures to illustrate your experimental results.

- **Conclusion (5%)** Summarize your key results - what have you learned?

Writing / Formatting (5%) Is your paper clearly written and nicely formatted?