Session 2 *(In preparation for Class 2, students are asked to view Lecture 2.)*

Topics for Class 2

Origami intro: Origami alphabet, higher dimensions.
Universality: Terminology history, practical strip folding, pseudopolynomial bounds, seam placement, hide gadget via simple folds?
Simple folds: Metal/wood/plastic motivation, definition, examples, linear-time algorithm, extra creases.

Detailed Description of Class 2

This class is structured around the many excellent questions that students asked and suggestions they made (with a few highlights in bold):

- **Actual folding** (we'll fold the numerals 6, 8, 4, 9 from an origami alphabet!)
- Some history of where a few terms come from.
- Practical examples of strip folding.
- Pseudopolynomial bounds on strip folding: what they are and what's (un)known.
- Seam placement (some skipped content in L02's notes)
- **Open problem** about simply folding the hide gadget: let's solve it together!
- Motivation for simple folds: metal/wood/plastic bending
- Definition of simple folds: more precise
- Examples of flat-foldable vs. mingling 1D mountain-valley patterns
- **Algorithm for testing 1D flat foldability** in linear time (new -- simpler than textbook!)
- Making any mountain-valley pattern flat foldable by adding extra creases
- Higher-dimensional folding

Topics for Lecture 2

Origami intro: Piece of paper, crease pattern, mountain-valley assignment.
Universality: Folding any shape (silhouette or gift wrapping).
Simple folds: 1D flat-foldability characterization, 2D map-folding algorithm.

Detailed Description of Lecture 2

This lecture kicks off a series of lectures about origami. It focuses on a relatively simple kind of origami, called "simple folds", which involve folding along one straight line by ±180 degrees. These are some of the most "practical" types of folds from an automated manufacturing standpoint, are well-studied mathematically, and a good warm-up before we get to complex origami folds which fold many creases at once.

On the design side, we'll see how simple folds are enough to fold any 2D shape, and with slightly more general folds, we can fold any 3D shape even with a two-color pattern on the surface.

On the foldability side, we'll see how to efficiently determine whether a crease pattern with mountains and valleys indicated can be folded flat in two interesting cases: 1D pieces of paper (in other words, parallel creases in a strip of paper) and 2D rectangular maps.