- The homework is due on April 13, 23:59pm. Please submit your solutions to Gradescope.
- Starting from Homework 1, all homework sets allow *group submissions* up to 2 people. Please write down the names of the members *very clearly* on the first page of your solutions.
- Answer the questions in a way that is clear, correct, convincing, and concise. The level of details to aim for is that your peers in this class should be convinced by your solutions.
- You are expected to spend a reasonable amount of time (measured in hours) working on these problems. Remember you are allowed to utilize any resources. Make sure to cite all the people/webpages/source of infomation that helped.
- Some problems are marked with a *star*; these are more challenging (and fun) extra credit problems. They are optional and do not count toward raw grades.

---

1. ***Gauss code.*** A ***Gauss code*** is a cyclic string of $2n$ symbols where each symbol occurs exactly two times; it is ***signed*** if in addition each symbol x is attached with a plus/minus sign +/-, one for each occurrence of x. A Gauss code is ***planar*** if it encodes the sequence of crossings we see as we traverse an n-vertex planar curve γ; the signing of the Gauss code correspond to the Gauss signs of the crossings of γ.

   Describe and analyze an algorithm whether a given signed Gauss code is planar.

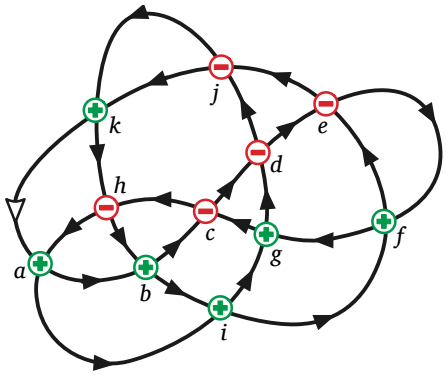

Figure 1. A planar curve with Gauss code `[abcdefgchaigdjkhbifejk]` and signing `[++---+++--+-+-++---++-]`.