INTRODUCTION TO MATROID AND ITS REPRESENTABILITY

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Abstract. This paper introduces a mathematical structure called Matroid which abstracts the concept of linear independence. The goal of this paper is to discuss the representability of matroid, which will be defined later in this paper, and introduce some examples, sketches of proofs about some of the important theorems and conjectures about representability and others.

Contents

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Definition 3.1. contraction

Definition 3.2. deletion

3.1. **What do contraction and deletion mean in graphs and vector spaces?**

3.2. **Why do these matter?** Because of a matroid is representable over some field

$$\mathbb{F}$$

, its minor is always representable over

$$\mathbb{F}$$

.

3.3. **The introduction of Rota's conjecture.**

4. More discussion on matroid representability

This is going to be the bread and butter of the paper. I am planning to write several chapters about matroid representability. Some ideas I have at this point include:

- (Sketch of) proofs of some small cases of Rota's conjecture
- List of interesting matroids that are not representable