Matroid Theory Tutorials:
(8) Gammoids

Homework

Definition 1. *Let $G = (V, E)$ be a directed graphy and $X, Y \subseteq V$. We say that X* is connected to *Y, if there are $|Y|$ vertex disjoint paths from X to Y. (The path are vertex disjoint not just internally vertex disjoint. We allow paths of length 0 if $X \cap Y \neq \emptyset$.)*

Definition 2. *Let $G = (V, E)$ be a directed graph and $S, T \subseteq V$. A* gammoid *is a matroid over a set T and a subset $X \subseteq T$ is independent if S is connected to X in G. A gammoid is strict if $T = V$.*

HW 1. Let $\mathcal{G}$ be a gammoid over a set T. Show that rank of a set $X \subseteq T$ is equal to the size of the minimum (S, X)-cut.

HW 2. Show that every uniform matroid is isomorphic to some gammoid. Is it possible to represent every uniform matroid as a strict gammoid?