Hyper graph $G = (V, E)$ $\mathrm{tr}(G)$ the set of minimal transversals of G.
If $G = (V, G)$ then $E(G) = E$.

1 Greedoid

in Section 2 of the full report

greedoid is a hypergraph (V, G) with the following properties:

1. E is not empty.
2. E is accessible (to the empty edge), for each $H \in E$ s.t. $H \neq \emptyset$, there is $v \in V$ such that $(H - \{v\}) \in E$
3. E is augmentable (shorter edges can be made longer). for two edges A, B with $|A| < |B|$, there is $v \in B - A$ such that $A \cup \{v\} \in E$.

A basis is maximal super edge in E wrt set-inclusion. Clearly, all basis have the same length due the aumenttability. A basis is edges with longest length.

A matiod is a heredatary greedoid, if H is an edge then its any subset also is an edge.

interval greedoid $G = (V, E)$: For edges A, B, C and vertex x,

$$A \subseteq B \subseteq C \text{ and } A \cup \{x\}, C \cup \{x\} \in E \Longrightarrow B \cup \{x\} \in E$$

antigreedoid $G = (V, E)$: For edges A, B and vertex x,

$$A \subseteq B \text{ and } A \cup \{x\} \in E \Longrightarrow B \cup \{x\} \in E$$

antigreedoid is an interval one

Gaussian greedoid $G = (V, E)$: For X, Y with $|X| = |Y| + 1$,

$$X, Y \in E \Longrightarrow \exists x \in X - Y, \text{ s.t. } X - \{x\}, Y \cup \{x\} \in E$$

2 singular Tuples

in Section 5.2 of the full report.

singular tuple $(v_1, \cdots, v_m)$ for F.
v_1 is singular in F and, v_{i+1} is singular in $\mathrm{DP}_{v_1,\cdots,v_i}(F)$.
segment of a singular tuple is also singular.
1-singular (once positive and once negative) m-singular (non-1-singular)
$(v_1, \cdots, v_n)$ is 1-singular if every v_i is 1-singular
is non-1-singular if every v_i is non-1-singular.

Totally singular tuple $(v_1, \cdots, v_n)$ if for every permutation π, $(v_{\pi(1)}, \cdots, v_{\pi(n)})$ is also a singular tuple.
about totally singular see Subsection 5.4
Conjecture: If $(v_1, \cdots, v_n)$ is non-1-singular then it is totally singular.

More question see 5.27, 5.37.

3 Hypergraph of singular sets

ssh(F) the hypergraph of singular sets of F.
vertices are variables,
edges are $\{v_1, \cdots, v_n\}$ such that $(v_1, \cdots, v_n)$ is a singular tuple. that is, an edge can be a singular tuple by rearrange the order.

mss(F) the hypergraph of maximal singular sets. consists of longest edges of ssh(F). i.e. H with $|H| = \mathrm{si}(F)$

singular variable hypergraph svh(F):
edges: $\{\mathrm{var}(x) \mid x \in C \text{ and } x \text{ is singular in } F\}$ for all $C \in F$ with this set non-empty.