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TRANSVERSAL MATROIDS AND THEIR PRESENTATIONS

A matroid M on a finite ground set S is said to be *transversal* if its collection of independent sets are partial transversals of a system $\mathfrak{A} = (A_1, ..., A_n)$ of subsets of S. The system $\mathfrak{A}$ can be represented by a bipartite graph $G_{\mathfrak{A}} = (S \cup V, E)$. We are going to see how to spot the circuits of M by looking at $G_{\mathfrak{A}}$. If $S' \subseteq S$, let $S_{\mathfrak{A}}$ denote the induced subgraph of S', V' in $G_{\mathfrak{A}}$, where V' is the elements from V which are adjacent to at least one element in S'. If a $G_{\mathfrak{A}}$ for a transversal matroid M is acyclic, then $C_{\mathfrak{A}}$ admits a particular nice description for every circuit C of M. Moreover, if the members of $\{C_{\mathfrak{A}} : C \text{ is a circuit of } M\}$ intersect in some particular way in $G_{\mathfrak{A}}$, we can get another presentation $G_{\mathfrak{A}'}$ of M such that part of $G_{\mathfrak{A}'}$ is acyclic.