Groups and Graphs

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Abstract

Associating graphs to groups dates back to Arthur Cayley. Cayley graphs play an important role in various fields of mathematics, ranging from geometric group theory to algebraic combinatorics, from representation theory to discrete mathematics, from operator algebras to algebraic coding theory. In this talk, we discuss about another such graph defined on groups, called *co-maximal subgroup graph* $\Gamma(G)$ of a group G whose vertices are non-trivial proper subgroups of G and two vertices H and K are adjacent if $HK = G$. Though the definition allows the possibility of G to be infinite, in our discussion, we will focus mainly on finite groups. We discuss various graph parameters like diameter, connectedness, girth, bipartiteness etc. Finally, we will highlight some problems on realizability and graph isomorphisms, and some partial solutions to those questions in terms of properties of G. The results presented in the talk can be found in [1–3].

References

[1] S. Akbari, B. Miraftab and R. Nikandish, Co-maximal Graphs of Subgroups of Groups, Canadian Math Bulletin, Vol. 60(1), pp.12-25, 2017.

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[3] M. Saha, S. Biswas and A. Das, On Co-Maximal Subgroup Graph of $\mathbb{Z}_n$, International Journal of Group Theory, Article in Press `https://ijgt.ui.ac.ir/article_25995.html`