On the Graphs associated with ideals of Semigroups

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In this presentation, we shall discuss about the graphs constructed on ideals of semigroups. We study intersection ideal and inclusion ideal graphs of semigroups. The intersection ideal graph $\Gamma(S)$ of a semigroup S is a simple undirected graph whose vertices are all nontrivial left ideals of S and two distinct left ideals I, J are adjacent if and only if their intersection is nontrivial. The inclusion ideal graph $\mathcal{I}n(S)$ of a semigroup S is a simple undirected graph and $V(\Gamma(S)) = V(\mathcal{I}n(S))$ and two distinct left ideals I, J are adjacent if and only if either $I \subset J$ or $J \subset I$. Note that $\mathcal{I}n(S)$ is a spanning subgraph of $\Gamma(S)$. We study various graph theoretic parameters of these graphs including connectedness, girth, planarity, perfectness, clique number, independence number etc. Further, we shall discuss automorphism group of these graphs, when S is completely simple semigroup.

Keywords: intersection graph, inclusion graph, independence number, automorphism group