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## Abstract

An induced subgraph  $S$  of a graph  $G$  is called a derived subgraph of  $G$  if  $S$  contains no isolated vertices. An edge  $e$  of  $G$  is said to be residual if  $e$  occurs in more than half of the derived subgraphs of  $G$ . We prove some theorems which calculate the number of derived subgraphs for some special graphs. We also present a new algorithm SDSA that calculates the number of derived subgraphs for a given graph  $G$  and determines the residual and non-residual edges. Finally, we introduce a computational study which supports our results.

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