

# Abstract

The algebraic connectivity of a graph is the second smallest eigenvalue of the Laplacian matrix. We first state some basic definitions and notations. After that we explain some predefined results and properties of algebraic connectivity of some graphs. We also explore some bounds of algebraic connectivity of graphs using sum of the squares of the degrees of simple graphs. Using these results and sum of the squares of the degrees of simple graphs we introduce some new results that are related to algebraic connectivity of graphs.