

# DISTANCE MAGIC GRAPHS

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Let  $G = (V, E)$  be a graph with  $|V| = n$ . For any vertex  $v \in V$  we denote by  $N(v)$  the set of all vertices which are adjacent to  $v$ . The set  $N(v)$  is called the open neighborhood of the vertex  $v$ .

Distance magic labeling of a graph  $G$  of order  $n$  is a bijection  $f : V \rightarrow \{1, 2, \dots, n\}$  with the property that there is a positive integer  $k$  such that  $\sum_{y \in N(x)} f(y) = k$  for every  $x \in V$ . The constant  $k$  is called the magic constant of the labeling  $f$ . A graph which admits a distance magic labeling is called a distance magic graph.

**Problem 1.** Does there exist a graph  $G$  with two distance magic labelings with different magic constants?

Let  $S = \{k : \text{There exists a distance magic graph with magic constant } k\}$ . It is well known that all odd integers are in  $S$ . We pose the following conjecture.

**Conjecture 1.** The set  $S$  does not contain any power of 2.

The following paper gives a recent survey on this topic.

S. Arumugam, Dalibor Froncek and N. Kamatchi, *Distance Magic Graphs - A Survey*, Journal of the Indonesian Mathematical Society, Special volume for the proceedings of IWOGL 2010 (To appear).