ON THE NUMBER OF α -LABELED GRAPHS

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Abstract

When a graceful labeling of a bipartite graph places the smaller labels in one of the stable sets of the graph, it becomes an α -labeling. This is the most restrictive type of difference-vertex labeling and it is located at the very core of this research area. Here we use an extension of the adjacency matrix to count and classify α -labeled graphs according to their size, order, and boundary value.

Keywords: α -labeling, α -graph, graceful triangle.

2010 Mathematics Subject Classification: 05C30, 05C78.

REFERENCES

- [1] B.D. Acharya and S.M. Hegde, *On certain vertex valuations of a graph*, Indian J. Pure Appl. Math. **22** (1991) 553–560.
- [2] V. Ajtha, S. Arumugam and K.A. Germina, *On square sum graphs*, AKCE Int. J. Graphs Comb. **6** (2009) 1–10.
- [3] M. Bača and C. Barrientos, *Graceful and edge-antimagic labelings*, Ars Combin. **96** (2010) 505–513.
- [4] C. Barrientos and E. Krop, *Mean graphs*, AKCE Int. J. Graphs Comb. **11** (2014) 13–26.
- [5] C. Barrientos and S. Minion, *Enumerating families of labeled graphs*, J. Integer Seq. **18** (2015) 15.1.7.

- [6] C. Barrientos and S. Minion, *Three graceful operations*, J. Algorithms Comput. **45** (2014) 13–24.
- [7] C. Bu and J. Zhang, *The properties of (k, d) -graceful graphs*, preprint (2014).
- [8] G.J. Chang, D.F. Hsu and D.G. Rogers, *Additive variations on a graceful theme: some results on harmonious and other related graphs*, Proceedings of the Twelfth Southeastern Conference on Combinatorics, Graph Theory and Computing, Vol. I (Baton Rouge, LA., 1981), Congr. Numer. **32** (1981) 181–197.
- [9] G. Chartrand and L. Lesniak, *Graphs and Digraphs* (Wadsworth and Brooks/Cole, 1986).
- [10] W.C. Chen, H.I. Lü and Y.N. Yeh, *Operations of interlaced trees and graceful trees*, Southeast Asian Bull. Math. **21** (1997) 337–348.
- [11] R. Figueroa-Centeno, R. Ichishima and F. Muntaner-Batle, *The place of super edgemagic labelings among other classes of labelings*, Discrete Math. **231** (2001) 153–168.
doi:10.1016/S0012-365X(00)00314-9
- [12] H. Fukš and L. Sullivan, *Numeration of number-conserving cellular automata rules with two inputs*, J. Cell. Autom. **2** (2007) 141–148.
- [13] J.A. Gallian, *A dynamic survey of graph labeling*, Electron. J. Combin. (2015) #DS6.
- [14] R.B. Gnanajothi, *Topics in Graph Theory* (Ph.D. Thesis, Madurai Kamaraj University, 1991).
- [15] T. Grace, *On sequential labelings of graphs*, J. Graph Theory **7** (1983) 195–201.
doi:10.1002/jgt.3190070208
- [16] D. Jungreis and M. Reid, *Labeling grids*, Ars Combin. **34** (1992) 167–182.
- [17] M. Maheo and H. Thuillier, *On d -graceful graphs*, Ars Combin. **13** (1982) 181–192.
- [18] OEIS Foundation Inc., *The Online Encyclopedia of Integer Sequences* (2015).
<http://oeis.org>
- [19] D.A. Sheppard, *The factorial representation of major balanced graphs*, Discrete Math. **15** (1976) 379–388.
doi:10.1016/0012-365X(76)90051-0
- [20] C.-L. Shiue and H.-C. Lu, *Trees which admit no α -labelings*, Ars Combin. **103** (2012) 453–463.
- [21] Y. Yuansheng, X. Yue, X. Xirong and M. Xinhong, *Super edge magic labelings of book graphs*, Ars Combin. **93** (2009) 431–438.

Received 13 April 2015

Revised 28 October 2016

Accepted 28 October 2016