Summary: In the origins of complexity theory K. S. Booth and G. S. Lueker [in: Proceedings of the seventh annual ACM symposium on theory of computing, Albuquerque, NM, 1975. New York, NY: Association for Computing Machinery (ACM) 255–265 (1975; Zbl 0436.05058)] showed that the question of whether two graphs are isomorphic or not can be reduced to the special case of chordal graphs. To prove that, they defined a transformation from graphs $G$ to chordal graphs $BL(G)$. The projective resolutions of the associated edge ideals $I_{BL(G)}$ are manageable and we investigate to what extent their Betti tables also tell non-isomorphic graphs apart. It turns out that the coefficients describing the decompositions of Betti tables into pure diagrams in Boij-Söderberg theory are much more explicit than the Betti tables themselves, and they are expressed in terms of classical statistics of the graph $G$.

MSC:
- 05E40 Combinatorial aspects of commutative algebra
- 13D02 Syzygies, resolutions, complexes and commutative rings
- 05C07 Vertex degrees
- 05C60 Isomorphism problems in graph theory (reconstruction conjecture, etc.) and homomorphisms (subgraph embedding, etc.)

Keywords:
- linear resolutions;
- graded Betti numbers;
- edge ideals;
- graph isomorphism

Software:
- BoijSoederberg

References:
[1] Babai, László


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