

Povzetek

Fibonaccijev (p, r) -niz $\alpha_n^{(p,r)}$ reda n je binaren niz dolžine n , ki ne premore podniza zaporednih enic, daljšega od r , med dvema podnizoma zaporednih enic dolžine največ r pa leži vsaj p ničel. Pri tem sta p in r naravni števili, $p, r \leq n$. Naj bo $\chi_n^{(p,r)}$ množica vseh Fibonaccijevih (p, r) -nizov reda n . Fibonaccijeva (p, r) -kocka $\Gamma_n^{(p,r)}$ reda n je graf z množico vozlišč $\chi_n^{(p,r)}$, vozlišči pa sta sosednji, če se razlikujeta v natanko enem istoležnem bitu.

Resonančni graf $R(G)$ v ravnino vložena grafa G je graf, katerega vozlišča so popolna prirejanja v G , popolni prirejanji pa sta sosednji natanko tedaj, ko je njuna simetrična razlika meja notranjega lica grafa G .

V diplomskem delu bomo predstavili nekaj lastnosti in primerov Fibonaccijevih (p, r) -kock in resonančnih grafov. Pri tem bomo opazili, da so nekatere Fibonaccijeve (p, r) -kocke izomorfne resonančnim grafom v ravnino vloženi grafov. Prepričali se bomo, da so resonančni grafi cik-cak verig Fibonaccijeve $(1, 1)$ -kocke in določili, katere Fibonaccijeve (p, r) -kocke so izomorfne resonančnim grafom v ravnino vloženi grafov. Za vsako Fibonaccijevo (p, r) -kocko bomo opisali v ravnino vloženi graf, katerega resonančni graf ji je izomorfen, ali pa dokazali, da takšen graf ne obstaja.

Abstract

A Fibonacci (p, r) -string of order n with positive integers $p, r \leq n$ is a binary string of length n that does not contain a substring of more than r consecutive ones and there are at least p zeros between two substrings composed of at most r consecutive ones. Let $\chi_n^{(p,r)}$ denote the set of Fibonacci (p, r) -strings of length n . The Fibonacci (p, r) -cube $\Gamma_n^{(p,r)}$ of order n is a graph whose vertex set is $\chi_n^{(p,r)}$ and two vertices are adjacent if they differ in exactly one position.

The resonance graph $R(G)$ of a plane graph G is a graph whose vertices are perfect matchings of G , two perfect matchings being adjacent if their symmetric difference is a boundary of an interior face of G .

We will describe some properties and examples of Fibonacci (p, r) -cubes and resonance graphs. By doing so we will notice that some Fibonacci (p, r) -cubes are isomorphic to resonance graphs of certain plane graphs. For instance: Fibonacci $(1, 1)$ -cube of order n is isomorphic to the resonance graph of a zig-zag hexagonal chain of length n . We will determine which Fibonacci (p, r) -cubes are isomorphic to resonance graphs of plane graphs. For each Fibonacci (p, r) -cube we will either describe a plane graph whose resonance graph is isomorphic to it or prove that such a graph does not exist.

Math. Subj. Class. (2010): 05C70, 05C12, 92E10

Ključne besede: Fibonaccijeva (p, r) -kocka, popolno prirejanje, faktorizacija, resonančni graf, Z -transformacija grafa

Keywords: Fibonacci (p, r) -cube, perfect matching, factorization, resonance graph, Z -transformation graph

Literatura

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