

## ABSTRACT

The theme: Using spectral graph theory for finding chromatic number.

Diploma work: 90 p., 29 fig., 9 tabl., 2 appendixes, 32 sources.

GRAPH, COMPLETE GRAPH, BIPARTITE GRAPH, REGULAR GRAPH, CONNECTED GRAPH, SPECTRAL GRAPH THEORY, ADJACENCY MATRIX, SPECTRUM OF A MATRIX, GRAPH COLORING, CHROMATIC NUMBER, UPPER AND LOWER BOUNDS FOR THE CHROMATIC NUMBER OF A GRAPH.

The object of the study – a chromatic number for different classes of graphs.

Subject of study – methods of spectral graph theory.

The purpose of the study –to analyze the methods of the spectral graph theory to find the upper and lower limits of the chromatic number for different classes of graphs and to draw up an algorithm for calculating limits of the chromatic number and implement the program code based on it.

The method of study – consideration and analysis of methods of spectral graph theory.

Relevance – the use chromatic number and algorithms of drawing the vertices of graphs for practical applications: modeling and solving various planning problems, in the distribution of registers, for the technology of digital watermarks etc.

The analysis of methods of spectral graph theory, an algorithm for calculating the upper and lower bounds of chromatic number for different classes of graphs is compiled and software code is implemented.