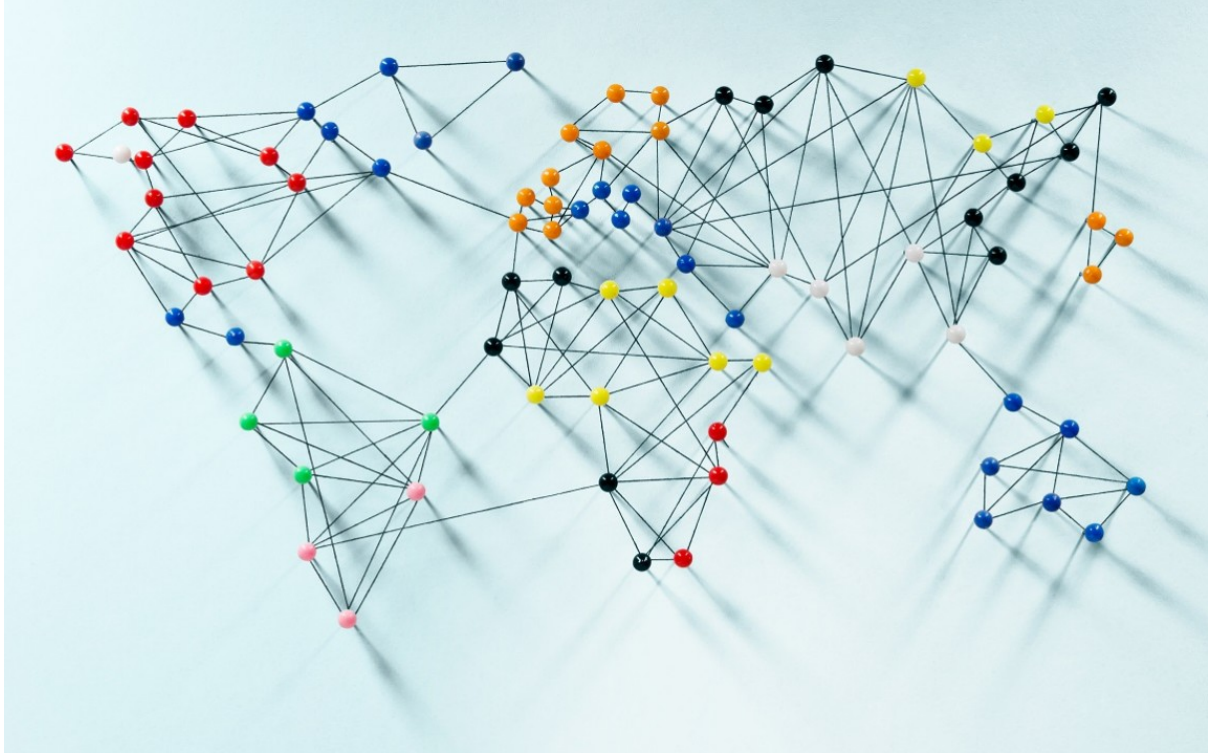# ONLINE MATH STUDENT RESEARCH PRESENTATIONS
hosted by
DOKUZ EYLÜL UNIVERSITY
DECEMBER 12, 2023 20:00-21:20 (GMT+3)

TALKS

20:00   Edge Covers of the Fan Graph
        by Troy Conlay[†]

20:20   *Edge Covers of Joined Cycle Graphs*
        by Marshall Nicholson[†], Ethan Woudwyk[†]

20:40   Edge Covers of Unions of Path and Cycle Graphs
        by Gizem Alkış[‡], Bridget Rozema[†], Ekrem Şimşek[‡], Maisie Smith[†], Laden Nur Yılmaz[‡]

21:00   Edge Cover Polynomials
        by Mallory Price[†], Can Selek[‡]

[†] Grand Valley State University, Michigan, USA

[‡] Dokuz Eylül University, İzmir, Türkiye

https://zoom.us/j/98368622318?pwd=YytqY2FMblJJTWUydFZMWUVMWmxlZz09
Meeting ID: 983 6862 2318 Passcode: 656879

All researches are supervised by Feryal Alayont, Grand Valley State University
Moderators: Seçil Gergün, Aslı Güçlükan İlhan, Dokuz Eylül University

Full list of titles and abstracts

20:00 Edge Covers of the Fan Graph
by Troy Conlay[†]

A graph models relationships between discrete objects using vertices (dots) and edges (lines) connecting pairs of vertices. An edge cover of a graph is a subset of the graph's edges chosen in a way so that each vertex is an endpoint of at least one edge in this subset. The numbers of edge covers for the graph families path and cycle graphs correspond to the well-known Fibonacci and Lucas numbers. A fan graph F_n is obtained by joining a path graph P_n with a vertex. In this talk, we will review the basics of edge covers, and present recurrence relation and closed formula results for the sequence formed by the number of edge covers of F_n.

20:20 *Edge Covers of Joined Cycle Graphs*
by Marshall Nicholson[†], Ethan Woudwyk[†]

A graph is a mathematical representation of binary relations between discrete objects. An edge cover of a graph G is a subset of the edges where every vertex of G is covered by at least one edge. Our project investigated counting edge covers of joined cycle graphs, specifically a chain of cycle graphs C_6 where two consecutive cycles share an edge. We will present a matrix model of counting the edge covers of these chains of cycle graphs.

20:40 Edge Covers of Unions of Path and Cycle Graphs
by Gizem Alkış[‡], Bridget Rozema[†], Ekrem Şimşek[‡], Maisie Smith[†], Laden Nur Yılmaz[‡]

An edge cover of a graph G is a subset of the edges where every vertex is the endpoint of at least one edge in the subset. In this project, we studied the number of sequences formed by counting the edge covers in a graph family. Path and cycle graphs generate the famous number sequences Fibonacci and Lucas numbers, respectively. We analyzed graphs obtained by taking the union of path and cycle graphs with one or more common vertices. This talk will detail our results on the edge cover sequences of these graph families.

21:00 Edge Cover Polynomials
by Mallory Price[†], Can Selek[‡]

The edge cover polynomial is the generating polynomial of the number of edge covers of a graph. This polynomial counts the edge covers based on the number of edges in them. It is known that the edge cover polynomials of path and cycle graphs have real roots, making their coefficients to be log-concave and unimodal. We will present our results on edge cover polynomials of other graph families obtained by modifying path and cycle graphs after reviewing the relevant background.

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