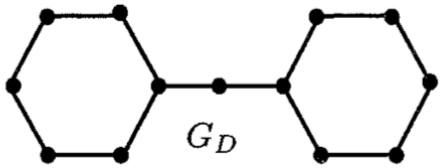
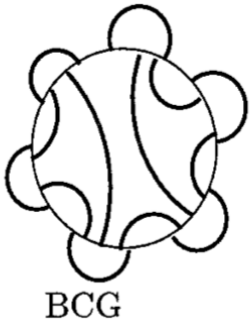
VCU Graph Theory
Computational Discovery Lab

Graphs & Knots!

Summer 2022

2106 Harris Hall
May 16—June 3
MTWThF, 10:00-1:00

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An *independent set* in a graph is a set of vertices which are pairwise non-adjacent. For any graph we can find *all* of the independent sets C of the graph and compute:

$$\sum_{\text{C independent}} (-1)^{|C|}.$$

This is a graph **invariant**. This means that it may be related to other graph invariants—and these connections can be studied. Understanding this number might lead to new insights about graphs—or knots. This invariant originates in the study of polynomials associated with knots. Along the way we might learn about the Jones polynomial in knot theory, the Tutte polynomial in graph theory, and myriad connections. We will start with little pre-existing knowledge—and **explore**!

All are welcome. Python programming experience would be useful. **Enthusiasm is necessary**. We will use Sage and an automated conjecturing program to do research on this, please **contact**:

Neal Bushaw (`nobushaw@vcu.edu`), **Craig Larson** (`clarson@vcu.edu`), or **Allison Moore** (`moorea14@vcu.edu`) **VCU Mathematics**