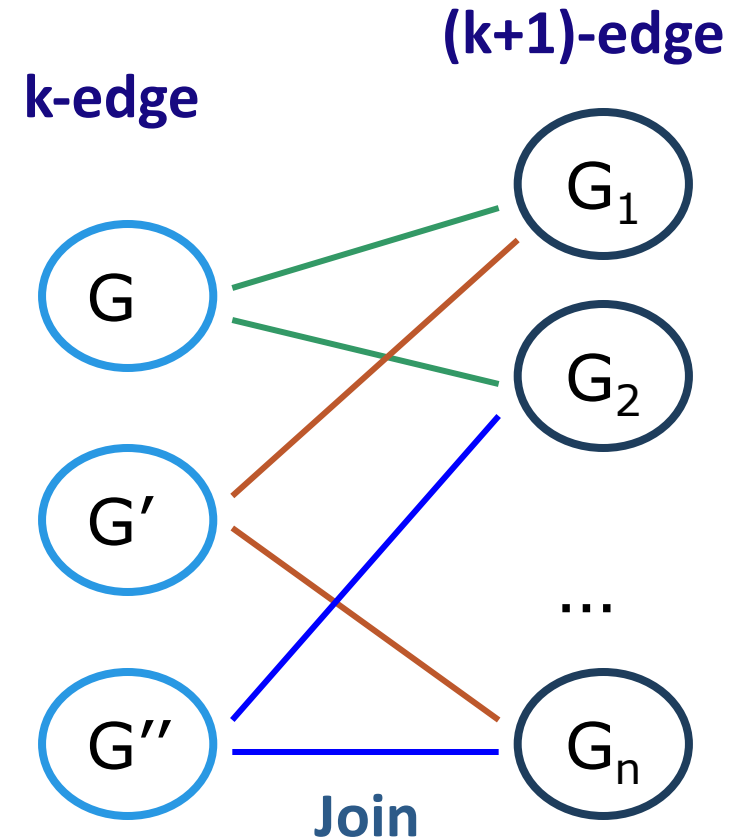


The background of the slide is a collage of various network and graph visualizations. It includes a dense network of red lines connecting green and blue nodes, a grid of small grey plus signs, a complex web of thin grey lines, and a cluster of orange and brown nodes. A semi-transparent white banner with a geometric pattern is positioned behind the title text.

# Graph Pattern Mining: Apriori-Based Approach

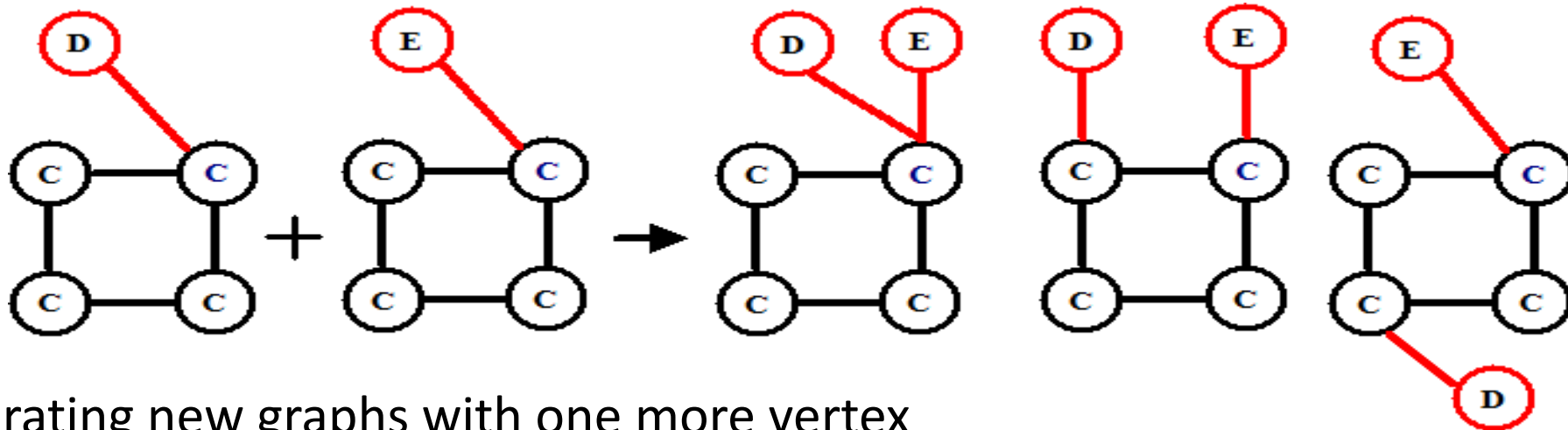
# Apriori-Based Approach

- The Apriori property (anti-monotonicity): A size- $k$  subgraph is frequent if and only if all of its subgraphs are frequent
- A candidate size- $(k+1)$  edge/vertex subgraph is generated if its corresponding two  $k$ -edge/vertex subgraphs are frequent
- Iterative mining process:
  - Candidate-generation  $\rightarrow$  candidate pruning  $\rightarrow$  support counting  $\rightarrow$  candidate elimination



# Candidate Generation: Vertex Growing vs. Edge Growing

- ❑ Methodology: Breadth-search, Apriori joining two size- $k$  graphs
  - ❑ Many possibilities at generating size- $(k+1)$  candidate graphs



- ❑ Generating new graphs with one more vertex
  - ❑ AGM (Inokuchi, Washio, & Motoda, PKDD'00)
- ❑ Generating new graphs with one more edge
  - ❑ FSG (Kuramochi & Karypis, ICDM'01)
- ❑ Performance shows *via edge growing* is more efficient