Graph Theory

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Outline

- History

- Definition

- Problems in Graph Theory

- Applications

History

- 1736
  - Seven Bridges of Konigsberg
- 1845
  - Kirchhoff publishes circuit laws
- 1852
  - Guthrie and the 4 color problem

Definitions

- Graph
  - Set of objects called points or vertices connected by links called lines or edges
- Undirected Graph
  - A line from pt. A to pt. B is considered the same as a line from pt. B to pt. A
- Directed Graph
  - A graph where the directions are counted as being distinct

Problems in Graph Theory

- Graph Coloring
  - The four-color problem
- Route Problems
  - Seven Bridges of Konigsberg
  - Traveling Salesman problem

Applications

- Network Analysis
  - Analysis to determine structural properties
  - Analysis to find a measurable quantity
- Graph Theory used chemistry and physics