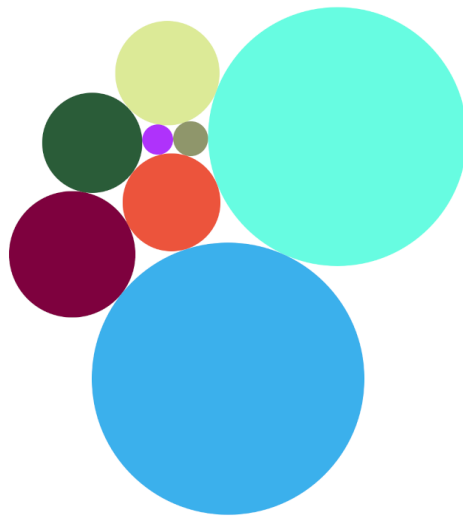
Planar graphs, circle packings, and conformal maps

Brice Loustau (HITS & Heidelberg University)



HITS Lab Meeting

07.09.2020

Planar graphs, circle packings, and conformal maps

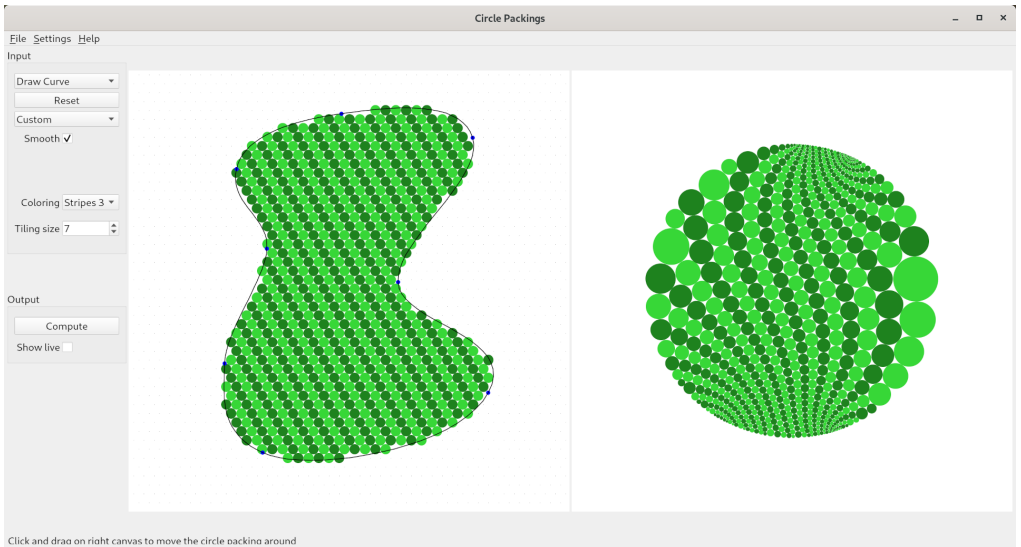
Outline.

1. Planar graphs
2. Circle packings
3. Conformal maps
4. Beyond

Planar graphs, circle packings, and conformal maps

Outline.

1. Planar graphs
2. Circle packings
3. Conformal maps
4. Beyond



The software: *Circle Packings* (with B. Beeker)
brice.loustau.eu/circlepackings

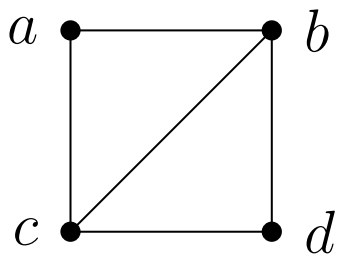
1. Planar graphs

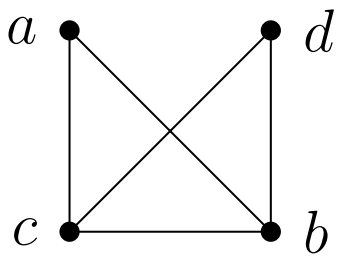
A ***graph*** is a data structure consisting of:

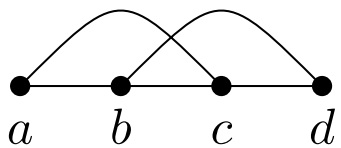
- A set of *vertices*
- A set of *edges* = relation between vertices

A ***graph*** is a data structure consisting of:

- A set of *vertices*
- A set of *edges* = relation between vertices

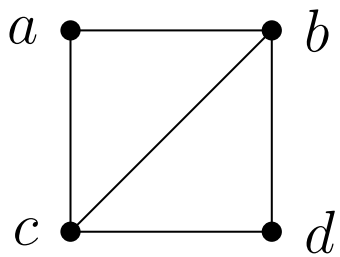


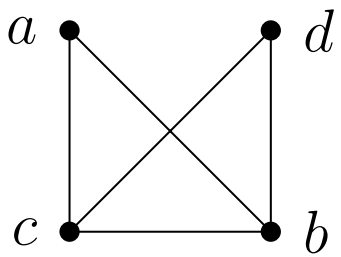


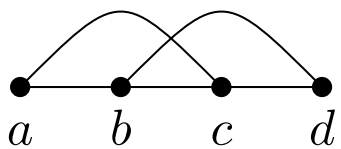


A ***graph*** is a data structure consisting of:

- A set of *vertices*
- A set of *edges* = relation between vertices



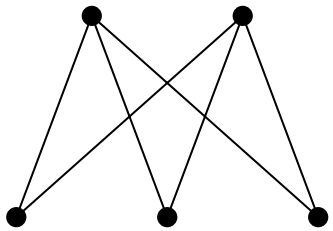


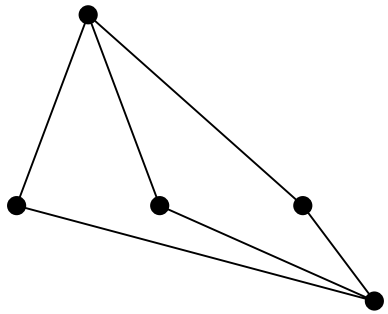


Applications of graph theory: Computer science (networks), linguistics, physics and chemistry, biology, social sciences, etc.

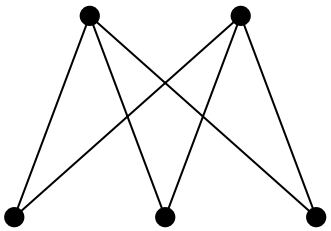
A graph is called ***planar*** if it can be drawn on the plane with no edge crossings.

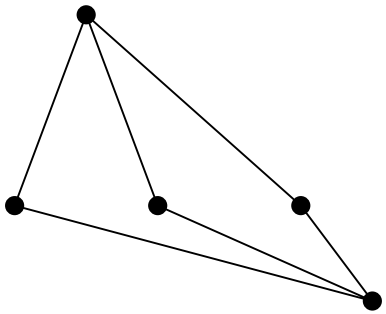
A graph is called ***planar*** if it can be drawn on the plane with no edge crossings.

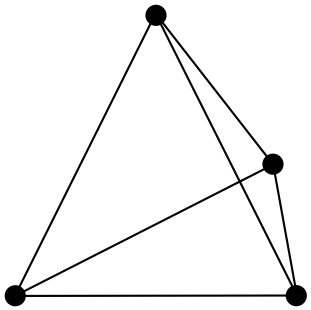


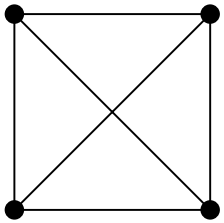


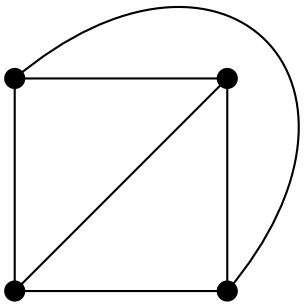
A graph is called ***planar*** if it can be drawn on the plane with no edge crossings.

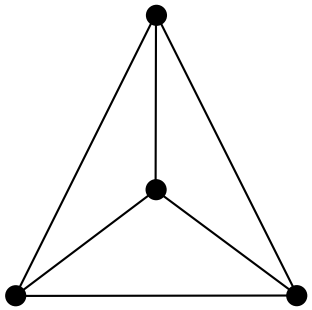




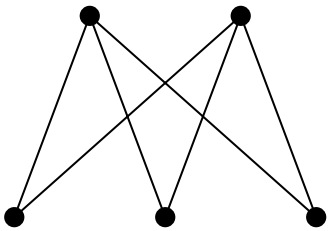


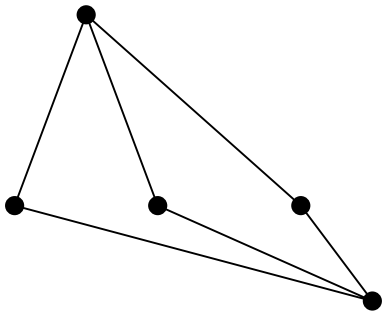


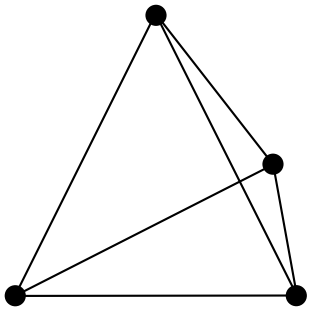


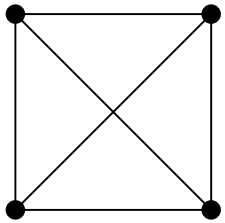


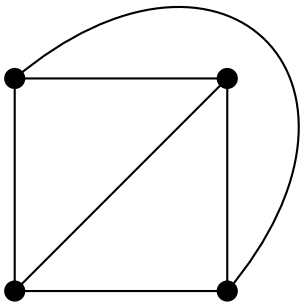
A graph is called ***planar*** if it can be drawn on the plane with no edge crossings.

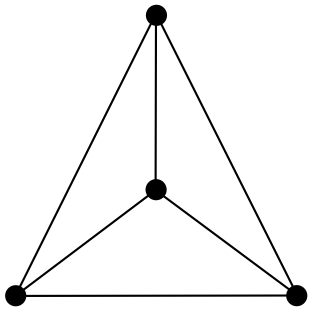


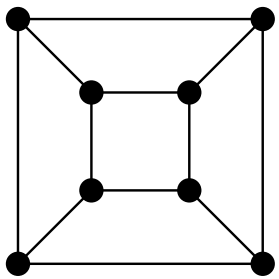




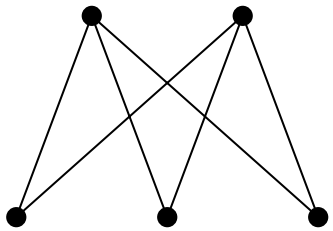


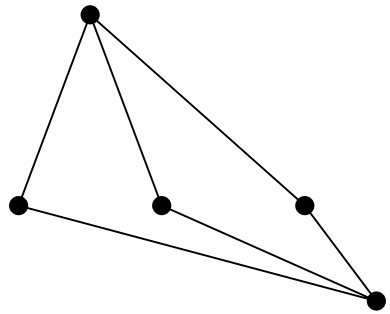


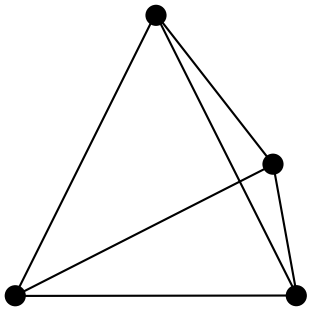


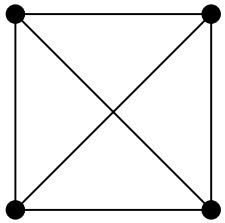


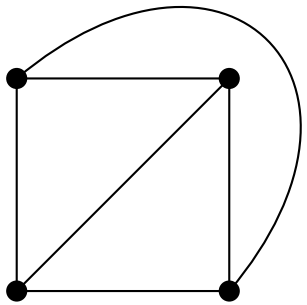
A graph is called ***planar*** if it can be drawn on the plane with no edge crossings.

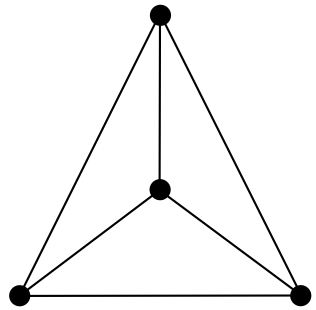


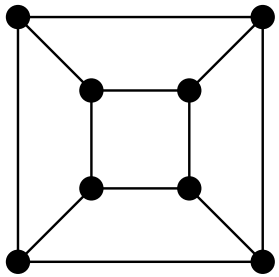


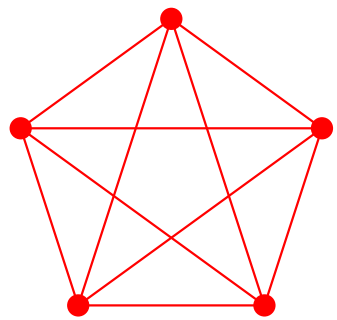












Appollonian circle packings and number theory.