
CSCI 2200
Foundations of
Computer Science

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Agenda

Course motivation

Your instructional team

Course structure & admin details

Actual course content

“Computer science is as much about computers as astronomy is about telescopes.” –Edsger Dijkstra

So what is computer science, then?

Computer science:

- is a mathematical discipline.
- is device agnostic.
- is *NOT* merely software engineering or programming.

The big goal: Computability & complexity

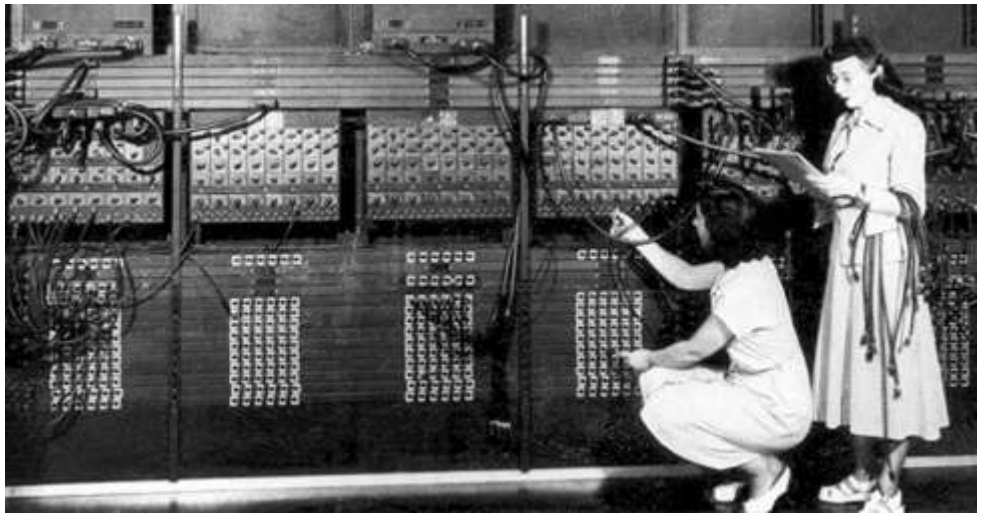
Explore these questions:

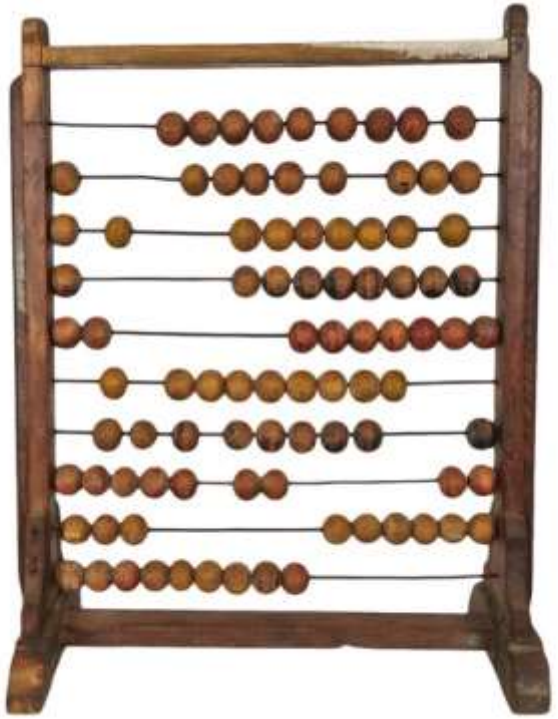
- What can be calculated? Are there mathematical questions to which an answer cannot be computed ***at all***?
- How efficiently can these computations be done? How do we measure this?

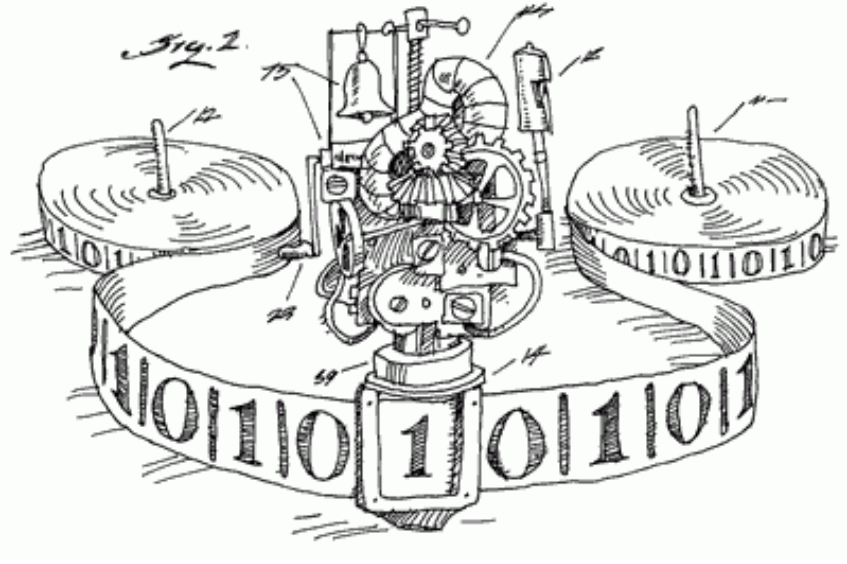
“Anything” can play Doom…

(photo credit gamesradar.com)

… but what's the simplest such device?







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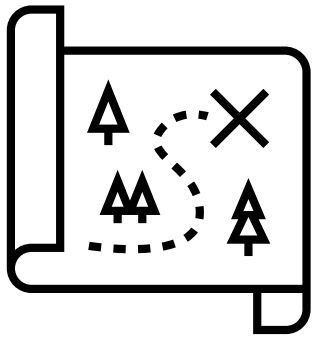
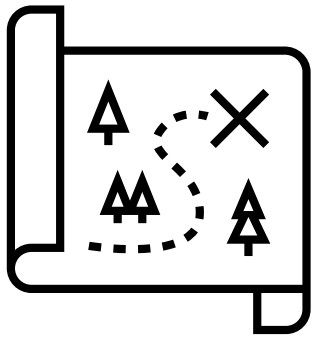


Discrete structures	• Sets, sequences, and graphs
Combinatorics	• Careful counting & probability
Automata	• Basic computing machines
Mathematical discipline	• Building precision in writing and dialogue

En route…



Discrete structures	• Sets, sequences, and graphs
Combinatorics	• Careful counting & probability
Automata	• Basic computing machines
Mathematical discipline	• Building precision in writing and dialogue (yes, that means proofs)

Back to Dijkstra…

“The required techniques of effective reasoning are pretty formal, but as long as programming is done by people that don't master them, the software crisis will remain with us and will be considered an incurable disease. And you know what incurable diseases do: they invite the quacks and charlatans in, who in this case take the form of Software Engineering gurus.”

Instructional team

Dr. Alex Gittens

Office: Lally 316

Office hours: Mon. & Thu. 10-11am

E-mail: gittea@rpi.edu

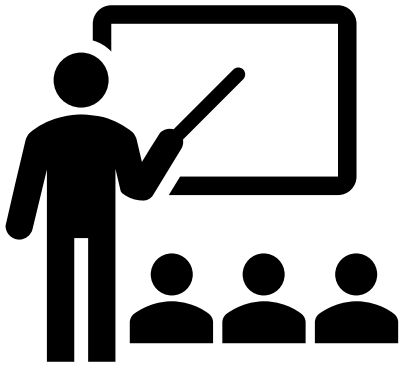
Dr. Dan DiTursi ’98 ’02

Office: Amos Eaton 123A (first one on the right side)

Office hours: Tuesdays 9:30 – 12:00
Thursdays 14:00 – 16:30

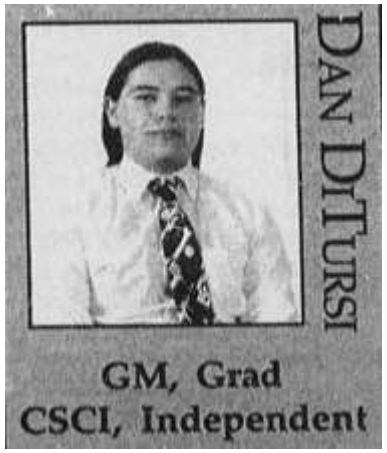
E-mail: ditursi@rpi.edu

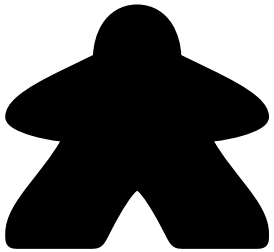
About me

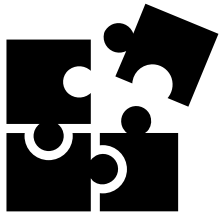


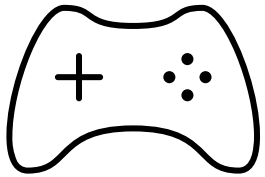
Gaming Club

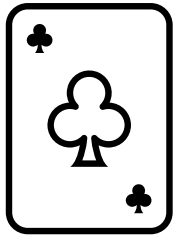
Contact: Dan DiTursi, ditursi@rpi.edu
Club E-mail: gaming@rpi.edu
Home page: http://rpigaming.dhs.org/
Description: The Gaming Club's purpose is to promote the pastime of gaming in all of its forms. We play strategy games ranging from Titan to Advanced Civilization, card games (bridge!), collectible card games (and non-collectibles, like Abduction), and role playing games of all sorts. We also hold several live-action role-playing events over the course of the year. If you're interested, drop by our meetings at noon on Saturdays in CII 4034.











Lead Teaching Assistant

Lilian Ngweta

Office hours: F 14:00-16:00, AE 127

Lilian will handle much of the admin work (e.g. updating Submitty), posting grades, etc.

Section TAs/Cas (all recitations in Troy 2018)

Section 1 – Eric Scheer

Recitation: W 10:00 – 12:00

Office hours: Tu 10:00 – 12:00, AE 127

Section 2 – Mei Huang

Recitation: W 12:00 – 14:00

Office hours: M 12:00-14:00, AE 127

Section TAs/Cas (all recitations in Troy 2018)

Section 3 – Xingjian Zhao

Recitation: W 14:00 – 16:00

Office hours: M 14:00-16:00, AE 127

Section 5 – Jun Kim

Recitation: W 16:00 – 18:00

Office hours: Th 14:00 – 16:00, AE 127

Undergraduate mentors

Angelo Arrandale (arrana2)

Brian Diep (diepb)

Catherine Li (lic26)

Sophia Lin (lins12)

Ronin Silvestre (silver3)

William Young (youngw)

Justin Zhang (zhangj50)

Course structure and details

Syllabus stuff

Course website & schedule of topics

- https://www.cs.rpi.edu/~gittea/old-site/teaching/spring2025/focs.html
  - Includes syllabus & links to all other items
- Schedule of topics: https://www.cs.rpi.edu/~ditursi/FOCS/S25_Course_Schedule.pdf

Submitty

- CS department's LMS (learning management system)
- Homework submitted here
- Grades posted here
- https://submitty.cs.rpi.edu

- **However**, do not use the Discussion Forum feature. For that we have…

Piazza

- This is the place for discussion of course concepts, homework assignments, etc.
- Wiki-style editing
- Permits anonymous posting
- https://piazza.com/rpi/spring2025/csci2200

Attendance

Lecture & Recitation: Attendance will not be tracked. However, we are likely to have MUCH more sympathy for students who attend regularly.

Exams: Excused absences must be arranged one week in advance. Unexcused absences will be a zero.

A note about final exams

- The instructors have NO control over when during exam week the final will take place.
- Therefore, you must ensure that you can be on campus through the **end** of exam week.
- In particular, end-of-semester travel is NOT considered a valid reason to miss your final exam, and makeups will not be given for this reason.

Academic Integrity

Any instance of academic dishonesty is grounds for immediate failure of the course. You have been warned.

Academic Integrity – Specifics

- Chegg, StackOverflow, and similar sites are NOT ALLOWED.
- ChatGPT, CoPilot, and any other so-called "AI" model are NOT ALLOWED.
- No collaboration during exams.
- Homework answers must be your own, but you may help each other out.

Grading

Homework: 22%

- 2% each
- 13 assignments, 2 dropped

In-semester exams: 51%

- 17% each; exam dates are Jan. 29, Feb. 26, and Apr. 9

Final exam: 27%

- Cumulative
- End of semester travel is NOT AN EXCUSE for missing the exam.

Partial credit

All problems on homeworks and exams require you to show your work. For each problem, students receive:

- **100%** for a correct solution with work shown
- **80%** for significant progress with work shown
- **50%** for demonstrating that you understand the problem and making a reasonable attempt that failed
- **0%** for a serious error or lack of understanding

Deadlines…

… are firm!

Homeworks are due at 8:59pm on Thursdays. There will be no extensions.

(However, the two lowest HW scores will be dropped.)

Self-care

No course is worth damaging your health.

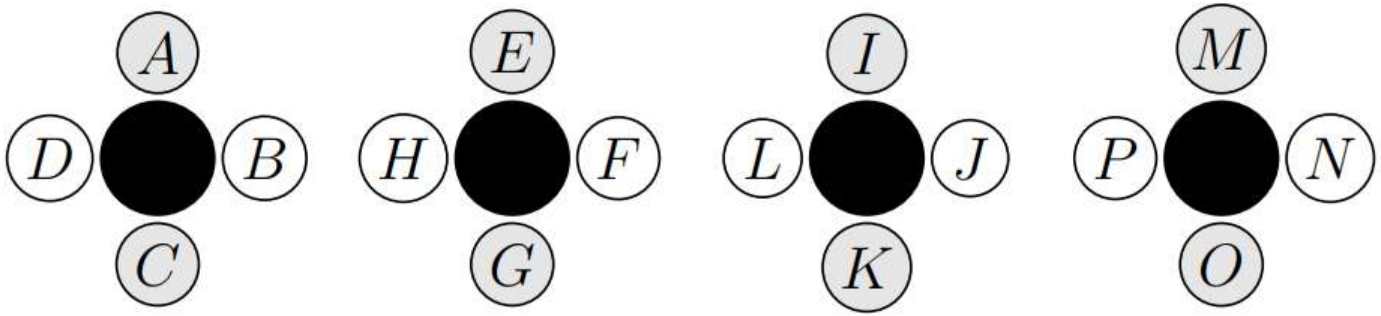
Take care of yourself: Eat, sleep, shower, take breaks, exercise, socialize, etc.

Take care of each other: Check in, say hello, don't let someone suffer in silence.

Don't be afraid to ask for help: We are more than happy to work with you, but YOU need to communicate.

Appetizer problems

Lab groups



A science class has 16 students in a lab section, and they need to be put in groups of four students for each lab. You want students to work with many different students as quickly as possible.

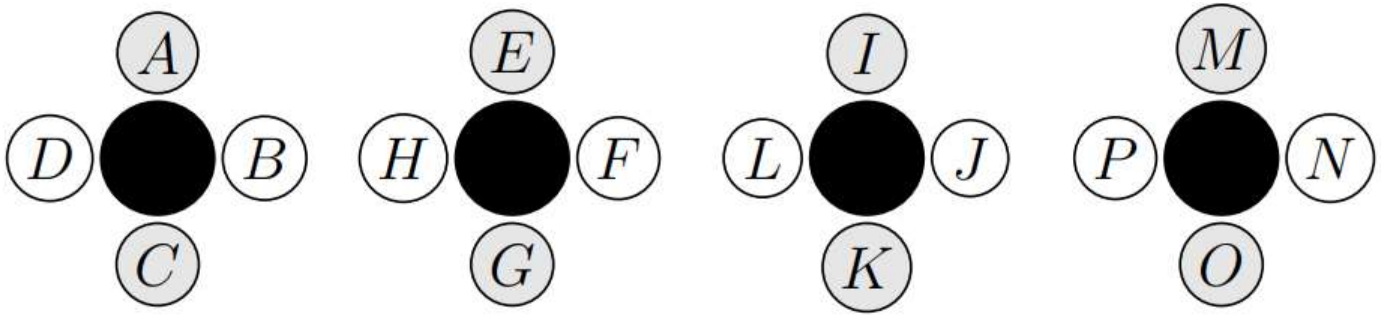
One person (e.g. Student P) could work with all 15 other students after five labs. Can EVERYBODY do so? If not, what's the minimum number of labs needed?

You have to PLAY with your ~~food~~ math.

As Malik says in the text, mathematics is NOT a spectator sport.

It's not enough to listen, to read, or to study. (Though those things are useful, too.) You have to actually DO it.

Lab groups – try it!

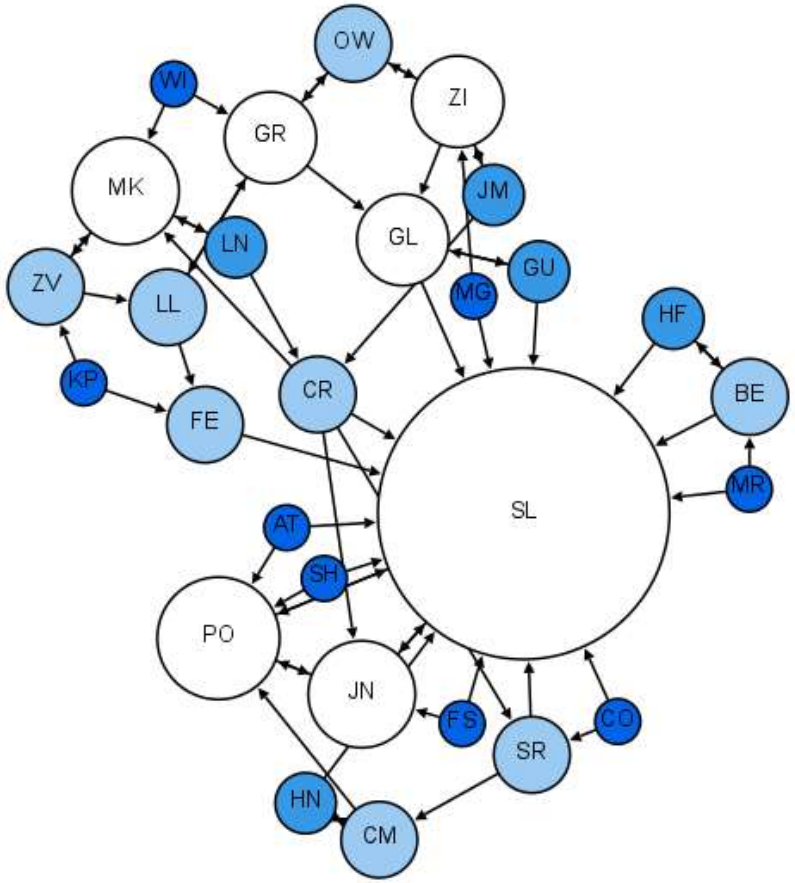


A science class has 16 students in a lab section, and they need to be put in groups of four students for each lab. You want students to work with many different students as quickly as possible.

DO NOW: Find an arrangement of the first two labs that allows every student to work with six different students.

If you finish quickly, extend it to the third lab, where every student works with NINE different students.

Contact tracing



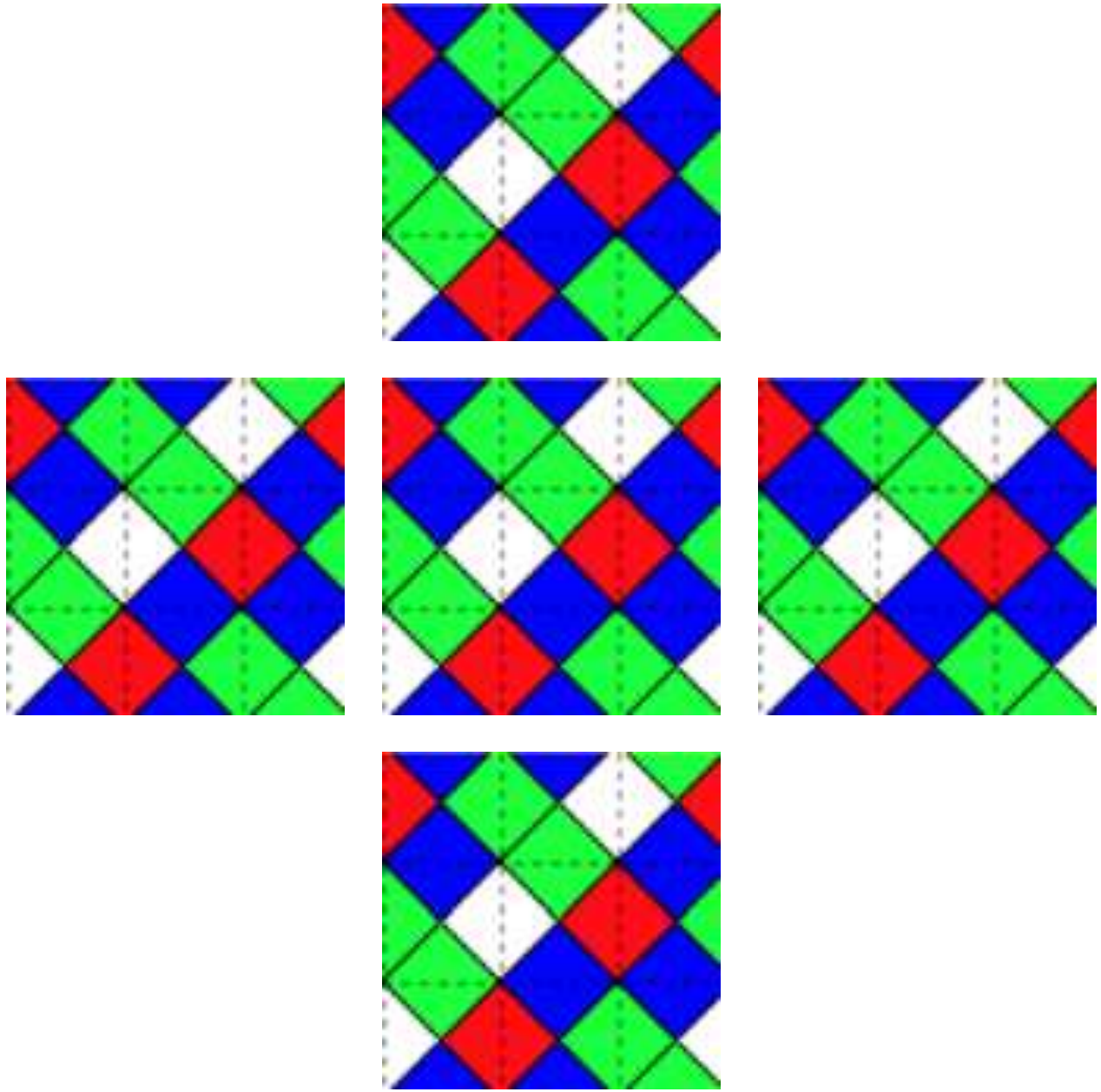
If you could construct a network of who everyone came into contact with on a regular basis, could you develop a vaccine priority strategy that minimized disease spread?

DO NOW: Talk with your classmates. What would be a good way to measure "importance" in this network?

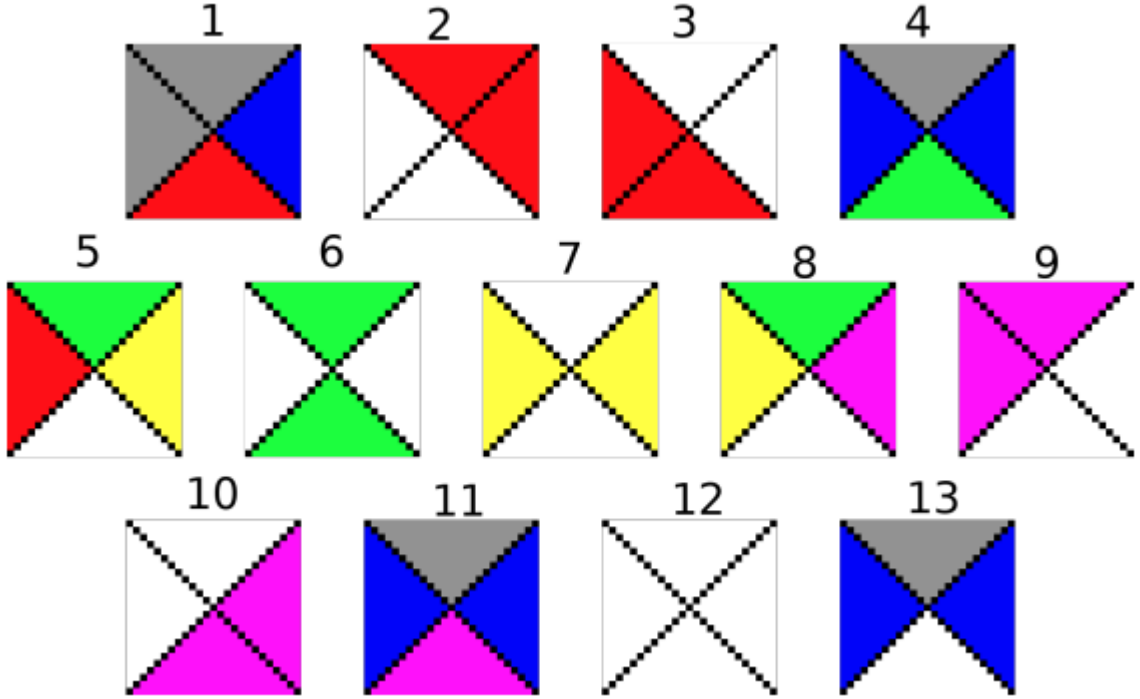
Tile the plane

How would you go about solving this?

Imagine a sheet of square-grid graph paper. If you had a whole bunch of copies of the tiles shown at left (without rotating them), could you fill the graph paper such that every edge had the same color on either side?



Tile the plane



Imagine a sheet of square-grid graph paper. If you had a whole bunch of copies of the tiles shown at left (without rotating them), could you fill the graph paper such that every edge had the same color on either side?

Could you write a computer program to solve this?

Working the problem

Model the problem using a discrete structure.

Play with a small version of the problem – look for a pattern.

Guess what the general solution might be, based on your pattern.

Prove your solution is correct!